



Research Article

Collaboration Between Educational Institutions and the Practical Field in Teacher Education-Epistemological Perspectives in a Project Aiming to Enhance Relevance in Vocational Teacher Education Through the Development of Teacher Education Schools

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Received: 21 February 2024; **Revised:** 9 September 2024; **Accepted:** 18 September 2024

Abstract: According to Norwegian and international research, many teacher education students find that their education is not sufficiently relevant for practising the teaching profession. In Norway, this has led to a political initiative, Teacher Education 2025, which focuses on developing special partnerships between teacher education institutions and schools, referred to as teacher education schools. The purpose of the partnerships is to strengthen quality and relevance so that teachers develop high-level professional competence. This article presents a project on the development of teacher education schools in vocational teacher education, where a crucial aspect is to analyse epistemological perspectives on teachers' development of professional competence and the collaboration between educational institutions and the practice field. The analysis suggests that challenges regarding relevance in teacher education are related to a one-sided rationalistic understanding of knowledge that influences the organisation and content of educational institutions, creating a division between practical and theoretical learning arenas and between professional work, learning and research. The analysis shows how pragmatic and critical perspectives can provide a more holistic understanding of teachers' professional competence and of teacher education. The article demonstrates how pragmatic and critical epistemological guiding principles and measures to develop teacher education schools can contribute to strengthening the connection between the content of the profession and the content of education. Key principles concern continuous, democratic collaboration between educational institutions and the practice field, where teacher education, school development and research are systematically rooted in professional teaching experience. The main conclusion is that strengthened professional relevance requires a holistic understanding of teacher competence and teacher education, which means that professional practice, learning, development of the school as a learning organisation, and research are integrated.

Keywords: relevant teacher education, coherence in teacher education, epistemological perspectives on teacher education, teachers' professional competence, practice-based teacher education

1. Introduction

The political goals to strengthen Norwegian teacher education are based on both Norwegian and international research, indicating that teacher education is not sufficiently profession-relevant and that close collaboration and

coherence between educational institutions and the practice field are prerequisites for achieving relevance and quality (Canrinus et al., 2019; Darling-Hammond, 2017; Heggen & Thorsen, 2015; NOKUT, 2006; 2013). Relevant professional education can be preliminarily defined as education where there is a close connection between the content of the profession and the educational content (Hiim, 2017). In the strategy document “Teacher Education 2025” (L 2025) (Norwegian Ministry of Education and Research, 2017), it is specified that strengthened partnerships between teacher education programmes and schools should involve mutually binding cooperation with “a primary focus on the core tasks and societal mandate of the teaching profession” (p. 8). Practical relevance, interdisciplinarity, and research grounding are emphasised as being crucial to strengthening educational quality. Collaborating on supervised professional training, educational programmes and research is highlighted. According to L 2025, teacher education schools should be beacons for other training schools.

The purpose of this article is to contribute epistemological perspectives on the challenges of professional relevance for teacher education and possible measures, developed in connection with the innovation and research project “Teacher Education Schools in Vocational Teacher Education” (LUSY). The project was initiated in the autumn of 2020 with support from the Research Council of Norway. The epistemological framework is based on the analysis and discussion of rationalist, pragmatist and critical perspectives on teachers’ professional competence and the collaboration between educational institutions and the practice field, which is the main theme of this article. The research question for the article is as follows: *What significance does collaboration between educational institutions and the practice field have for relevant teacher education and the development of teachers’ professional competence, and how can this collaboration be facilitated in light of pragmatic and critical epistemology?*

The aim of the article is to clarify how challenges regarding the lack of coherence and professional relevance may be rooted in a one-sided rationalist knowledge tradition that contributes to a division between practical and theoretical learning arenas and subjects, and how pragmatic and critical epistemological perspectives can help illuminate and develop a more holistic, profession-based and experience-based teacher education.

The initiation of the innovation project was based on an agreement between the Department of Vocational Teacher Education at OsloMet and two county municipalities, Viken and Oslo. Viken County Municipality is the project owner, and Strømmen Upper Secondary School in Viken, along with Kuben Upper Secondary School in Oslo, have agreed to be project schools. The agreement involves the parties undertaking a mutual commitment to collaborate in educating skilled vocational teachers. It specifies that the parties will cooperate on practice, educational programmes, and research and development work. According to the agreement, lasting structures for collaboration should be developed, and the parties should evolve as learning organisations, both individually and collectively. A key goal of the LUSY project is to develop and document a “model” for collaboration and coherence between educational institutions and the practical field.

First of all, to clarify the context, we will briefly present Norwegian vocational teacher education and how the relationship between educational institutions and the practice field is organised, and outline planned collaboration initiatives in the LUSY project. We will then examine what Norwegian and international research says about professional relevance and the need for coherence and collaboration between educational institutions and the practice field in vocational teacher education and teacher education in general. Next is an analysis of rationalist, pragmatist and critical perspectives on teachers’ professional competence and how it develops, primarily based on interpretations of Wittgenstein (2003), Heidegger (1978) and Habermas (1999). The analysis addresses epistemological perspectives on the design and organisation of educational programmes, learning arenas and research in teacher education, focusing on the relationship between the practice field and educational institutions.

The discussion in the final part of the article focuses on the need for a holistic concept of competence and how the coherence between teacher education institutions and the practice field, aimed at professional relevance, can be more specifically developed. The discussion is based on perspectives in pragmatist and critical epistemology and research on teacher education, related to principles and measures that will be tested and further developed in the LUSY project. We emphasise that this article is about the epistemological framework related to planned measures in the project. The empirical data on the further development and testing of these measures will be the subject of a later article.

Even though the context of the article is Norwegian vocational teacher education, challenges related to collaboration and coherence between educational institutions and the practice field are common in all types of teacher education. The National Curriculum Regulations for Vocational Teacher Education and other teacher education in

Norway also share many common features in terms of pedagogy, didactics and practice. The epistemological analyses and discussions in the article may therefore be of general interest. Challenges specific to vocational teacher education, especially those related to collaboration between schools and businesses, are not extensively addressed in this article, and we refer to another article for that purpose (Hiim, 2022).

In the next section, we will briefly elaborate on the context of the project and outline the planned initiatives going forward. We will then present empirical research that highlights the needs and potential measures for strengthened collaboration and relevance in teacher education.

2. Context and planned measures

The context of the project is Norwegian vocational teacher education, qualifying teachers to teach in one of the ten vocational education programmes in upper secondary schools. There are two paths to becoming a vocational teacher in Norway: the Practical-Pedagogical Education in Vocational Subjects (PPUY), a one-year university-level education (60 ECTS), or the three-year Vocational Teacher Education (YFL) at bachelor level (180 ECTS). PPUY requires a trade certificate, plus two years of vocational theoretical education beyond upper secondary school level and two years' work experience after obtaining the trade certificate; or relevant professional education at bachelor level, such as nursing or engineering. For YFL, the foundation is a trade certificate plus two years' work experience (Norwegian Ministry of Knowledge, 2013a; 2013b).

PPUY includes 30 ECTS in vocational pedagogy, 30 ECTS in vocational didactics, and a certain number of hours of professional training in a school setting, supervised by specific mentors called practice teachers. YFL includes a similar scope for these subjects and supervised practice. Additionally, the education programme consists of 60 ECTS in the "vocational depth" subject, which is specialisation in the teacher's own trade, such as carpentry or childcare and youth work; and 60 ECTS in "vocational breadth", covering all the various professions included in an upper secondary school vocational education programme.

There are several further educational options for vocational teachers, including a master's degree in vocational pedagogy, but there is currently no requirement for a five-year master's level education programme in the same way as for other teachers in primary and secondary education for grades 1-13.

The goals of the LUSY project for lasting, structured educational and research collaboration between teacher education institutions and schools align with the central guidelines in L-2025 (Norwegian Ministry of Education and Research, 2017). In the initial anchoring phase, some main measures were outlined. These measures were developed in consultation with the project management, consisting of the authors of this article and representatives of school owners, school leaders, and leaders from the Department of Vocational Teacher Education, who formed a reference group. The measures aimed to qualify both schools and teacher education institutions to strengthen their collaboration.

The first initiative is regular dialogue conferences between the parties, within each school, and at the teacher education institution, aimed at developing a common understanding of the goals and challenges in vocational teacher education. The second initiative entails collaboration between the parties to plan, implement and evaluate school-based practical teacher education equivalent to 30 ECTS. The education should focus on the supervision and practical guidance of student teachers, peer guidance, organisational learning, and professional and practice-based research and development work. Thirdly, a group with representatives from each party should be established to ensure the ongoing organisation and content of lasting collaboration.

The next section concerns research that can shed light on the significance of collaboration between educational institutions and the practice field for the development of teachers' professional competence.

3. Research highlighting professional relevance and collaboration in teacher education

3.1 *Research on Norwegian teacher education*

Research on Norwegian vocational teacher education and other teacher education programmes is first presented,

followed by international research highlighting relevance, coherence and collaboration.

Research on vocational teacher education is relatively limited. A relatively comprehensive study is inspired by the Stanford model's conceptualisation of teacher competence (Darling-Hammond, 2006, see below). The study indicates that students find themselves somewhat more than moderately well-prepared for the teaching profession in terms of the following tasks: creating a good learning environment, adapting teaching to students with different learning resources, planning and conducting teaching based on integrated subject and didactic principles, assessing students in ways that promote learning, developing professionally, and collaborating with businesses (Lyckander, 2021). However, several studies suggest that pedagogy, didactics and subject matter should be more integrated and more strongly related to practical professional tasks (Dahlback et al., 2019; Schaug & Herudsløkken, 2019; Sylte & Jahanlu, 2017).

In recent decades, several comprehensive evaluations of various types of Norwegian general teacher education programmes have been conducted. A survey from 2013 revealed that newly graduated students from the Practical-Pedagogical Education Programme (PPU) were relatively dissatisfied with the relevance of their education. They felt they were not sufficiently prepared to handle practical tasks such as classroom management and adapted teaching. According to the students, pedagogy, subject didactics and practice were not sufficiently integrated, and the quality of professional training and its coherence for campus learning was considered to be too variable (NOKUT, 2013).

An evaluation of primary and lower secondary teacher education from 2015 addresses whether the curriculum introduced in 2010 contributed to strengthening collaboration between teacher education institutions and practical fields (Munthe et al., 2015). The results show that practice teachers are more involved in programme planning and guiding students at the teacher education institution than previously. However, they experience varying degrees of support from subject and pedagogy teachers on campus and from their school leaders, which is also reflected in research on vocational teacher education (Herudsløkken et al., 2019). According to the survey, subject didactics and pedagogy have become more closely linked to the practice field, but there are significant variations between subjects and institutions. The study concludes that teacher education programmes should continue to prioritise strengthening professional relevance and collaboration between teacher education institutions and schools, as confirmed by other studies (Finne et al., 2016). The latest evaluations of Norwegian teacher education programmes, however, indicate that there is still a need to strengthen the integration of practice, pedagogy and subject didactics (NOKUT, 2023; 2024).

A study from 2015 emphasises the importance of the school leader and the teacher community at the practice school as a whole taking responsibility for student teachers' supervised practical training. This is necessary both to address multiple aspects of student teachers' development of teaching competence and to strengthen the school's own development (Heggen & Thorsen, 2015).

Overall, the Norwegian research results consistently point to the need to enhance professional relevance in teacher education through strengthened collaboration and coherence between teacher education institutions and the practice field.

3.2 International teacher education research

International teacher education research indicates that challenges related to relevance and coherence between practice and theory recur across models and systems (Darling-Hammond, 2017; Zeichner, 2010; Canrinus et al., 2015; Canrinus et al., 2019). Some of the research focuses on various attempts to address these issues.

The Stanford Teacher Education Program at Stanford University in California has been influential in the development and research of teacher education, including in Norway (Darling-Hammond, 2006; 2017). A central principle has been the need to conceptualise teachers' professional competence as a basis for evaluating the outcomes of teacher education. The fundamental question is posed as follows: "What should teachers know and be able to do?" (Darling-Hammond, 2006, p. 123). The core of the conceptual framework includes the following tasks and competences: the ability to teach students with diverse learning resources, to plan instruction based on integrated subject and didactic principles, to assess in ways that promote learning, to create learning processes and environments characterised by collaboration and inquiry-based learning, to contribute to professional communities, and to engage in individual and collective professional development. An overarching value is that teaching should contribute to enhancing social justice. Standards for measuring teacher competence have been developed based on these concepts. It is crucial for teacher educators to develop a common understanding of what students should learn and the purpose of teacher education (Darling-Hammond, 2006).

For a couple of decades, measures to enhance professional relevance and coherence between learning environments and subjects in the STEP model have focused on several key areas: education for practice teachers with an emphasis on guidance strategies and the use of professional standards, developing a strong relationship between the campus and a smaller number of practice schools, and integrating learning on campus and in practice through continuous alternation, with an emphasis on coherence between learning environments. The importance of developing teacher educators' competence in linking theory and practice is highlighted. It is considered crucial to assess whether and how student teachers can apply what they have learned: "It is critical to examine whether and how they can apply what they have learned in the classroom" (Darling-Hammond, 2006, p. 129). Early research on the model indicated that students developed high-level professional competence and felt well-prepared for the teaching profession (Darling-Hammond, 2006).

The Stanford model has inspired other teacher education programmes and studies in subsequent years and has also influenced measures in the LUSY project in ways that will be discussed in the last section of this article. A comprehensive study compared coherence and relevance at five universities in different countries/cities-Oslo, Stanford, Helsinki, Santiago and Havana (Canrinus et al., 2015; 2019). The study's conceptual framework is anchored in the key concepts of coherence, particularly the significance of structural coherence between subjects and learning environments, and conceptual coherence between content across different learning environments. It is emphasised that coherence is an ongoing process, rather than a given. Coherence between subjects/courses on campus and practice refers to "students trying out teaching strategies they learned about at the university in their practicum" (Canrinus et al., 2019, p. 3).

Results from the study show, as expected, that students at Stanford experience the greatest coherence between subjects, between concepts and between learning on campus and in supervised professional training. However, Stanford students still score relatively low in the category concerning the coherence between learning on campus and in practice, as do students at other universities. The study concludes that increased communication and collaboration between parties remain crucial for strengthening the internal coherence of teacher education and the development of students' professional competence. However, questions can be raised about the epistemological understanding implied by phrases like "applying" and "trying out" what one has learned on campus, which will be revisited.

Korthagen (2011) highlights an explicit epistemological perspective in what has been called a realistic approach to teacher education. A core element is that student teachers' practical experience of something that has challenged them is considered the foundation for professional learning. Through practical experience, concrete examples and reflection, student teachers develop holistic constructs and personal practical professional theories, which through guidance and teaching from teacher educators can be related to formal theory and new action alternatives. According to several studies, this type of teacher education contributes to high professional learning outcomes for students, but requires teacher educators to have expertise in a realistic approach (Korthagen, 2011; Hoekstra & Korthagen, 2011).

Zeichner (2010) refers to a range of studies highlighting the need to strengthen relevance and coherence in teacher education and emphasises the importance of an epistemological paradigm shift. According to Zeichner, activity theory with concepts such as boundary crossing can be effectively related to measures aimed at strengthening a shared understanding between parties about teachers' work, campus content and content in practice. Such measures include involving practice teachers and students in the development of programme plans for teacher education and in programme evaluation, with teachers and teacher educators who teach both on campus and at practice schools, the use of laboratories, and the development of specific partner schools. He also cautions against the view that everything can be learned in practice, which in the US has tended to be used as an argument for reducing the scope of teacher education and has led to a lack of respect for the teaching profession.

Darling-Hammond (2017) summarises results from a comprehensive comparative study of teacher education research across various parts of the world, focusing on what can be learned from well-functioning programmes (in the US, Canada, Europe and Asia). Some fundamental principles related to collaboration between teacher education institutions and practice fields are as follows: standards should be developed for what teachers should know and be able to do, and these should also be related to student curricula. Subjects, pedagogy, didactics and practice must be genuinely integrated in a proper balance. Teacher educators and practice teachers need to be qualified to link practice and theory, including in supervision. There must be high quality in practice, and specific teacher education schools should be developed.

It is essential to consider the teaching profession as a learning profession and the school as a learning organisation.

Lesson study, peer mentoring, collective and individual professional learning, including for school leaders, and school development are key concepts. Teachers need to learn both to use and understand research, and to conduct research on practical problems through, for example, action research. There is a need for teacher education programmes that integrate practical work and academic studies, even at the master's level. According to Darling-Hammond (2017), however, there is still a long way to go to spread these successful experiences to the majority.

Research on teacher education consistently shows a strong need for increased relevance through greater coherence between the content of education and the actual work of teachers. In the LUSY project, the focus will be on the following: anchoring the educational content in teachers' professional tasks, integrating learning environments and subjects, organisational learning and development, and practice-based research.

Although empirical findings largely coincide regarding the need for and measures of professional relevance in teacher education, there is variation in the theoretical perspectives in the research. Korthagen (2011) and Zeichner (2010) are among those who highlight the need to develop new epistemological frameworks to further elucidate challenges and measures in teacher education. Schön (1995) has emphasised that without epistemological grounding, efforts to enhance professional relevance risk being less profound. The next main section will analyse rationalist, pragmatist and critical epistemological perspectives on professional relevance and the relationship between educational institutions and practice field.

4. Epistemological perspectives on relevance and collaboration between educational institutions and practice fields

The purpose of teacher education is for teachers to develop high-level professional competence. In the following, various epistemological perspectives on professional competence and the collaboration between educational institutions and practice fields are discussed. It should be emphasised that different epistemological perspectives can overlap and are not necessarily either purely distinct or mutually exclusive.

The analysis first addresses criticism of a one-sided rationalist knowledge tradition in teacher education, followed by pragmatist interpretations of Wittgenstein (2003) and Heidegger (1978), as well as interpretations of Habermas (1999) related to the development of teachers' professional competence. In addition to the original literature by these authors, sources that critique rationalism in professional education (Dreyfus & Dreyfus, 1986; Eikeland, 2012; Schön, 1983) have been used. Sources that provide pragmatist interpretations of Wittgenstein and Heidegger related to analyses of professional knowledge and education (Dreyfus, 1991; Hiim, 2010; Janik, 1996; Molander, 1997) are also included.

4.1 A rationalist approach to teacher competence and collaboration between teacher education institutions and practice fields

Issues of relevance can be viewed through the lens of a dominant rationalist, technical knowledge tradition with roots in positivism (Dreyfus & Dreyfus, 1986; Eikeland, 2012; Janik, 1996; Molander, 1997; Schön, 1983; 1995). A rationalist, technical understanding of knowledge implies that knowledge is seen as a representation of given entities in the world that are lawfully related to one another (Molander, 1997). There is a tendency to view the relationship between theory and practice as a one-to-one relationship, where given concepts and conceptual structures can be transferred through verbal formulations and then applied in practical professional performance (Dreyfus & Dreyfus, 1986; Schön, 1983). This leads to the belief that theory can first be learned at the educational institution and then applied in teaching practice. A rationalist, technical concept of knowledge tends to emphasise the management, measurement and control of knowledge and learning in teacher education and other educational contexts, including standardised learning outcome descriptions and assessment forms.

A rationalist view of knowledge and learning has a long tradition in educational systems and institutions, including teacher education, and has been reinforced in recent decades by neoliberalism and New Public Management ideologies in public enterprises (Bottery, 2006). There are strong traditions for organised distinctions between theoretical and practical learning environments, and between subjects. The practical often has a lower status than the theoretical, as reflected, for example, in differences in financial and time resources. Our own understanding of knowledge and our

language are influenced by a rationalist tradition. Wordings suggesting that practical learning environments should be used to transfer and apply theory first learned on campus are common, as seen in some of the research on teacher education mentioned earlier (Canrinus et al., 2017, p. 3; Darling-Hammond, 2006, p. 129).

The distinction between the concepts of knowledge, skills and attitudes is related to a separation between theory and practice. The Norwegian Qualifications Framework for Higher Education (NKR), which governs the design of curricula in fields such as teacher education, categorises these into knowledge, skills and general competence (White Paper No. 9 2016-2017; White Paper No. 16 2016-2017). “Knowledge” is defined as an understanding of theories, facts, concepts, principles and procedures within fields, disciplines and/or professions. “Skills” refer to the ability to use knowledge to solve problems and perform tasks. These skills can be cognitive, practical, creative and communicative. “General competence” involves the ability to use knowledge and skills independently in various situations by demonstrating collaboration, responsibility and critical thinking, and largely concerns operationalised attitudes (www.nokut.no/nasjonalt-kvalifikasjonsrammeverk-for-livslang-laering).

A key principle of the qualifications framework is that knowledge, skills and general competence should be demonstrable and measurable through taxonomy systems (White Paper No. 28 2015-2016; White Paper No. 16 2016-2017). These taxonomies are based on the idea that knowledge, skills and attitudes can be understood and learned both separately and progressively, evaluated step by step up a ladder from the lowest to the highest level (Bloom et al., 1956).

Questions can be raised about how well these ideas capture the nature of professional teaching competence. The curricula for both the three-year vocational teacher education programme and the practical-pedagogical vocational teacher education are divided into knowledge, skills and general competence in accordance with the guidelines of the qualifications framework (Norwegian Ministry of Knowledge, 2013a; 2013b). It is likely that this categorisation may lead to a tendency towards fragmentation in the organisation of content and learning environments within teacher education, as suggested by research on Norwegian teacher education (Dahlback et al., 2019; Munthe et al., 2015; Schaug & Herudsløkken, 2019).

A rationalist epistemological perspective is linked to traditions for separating work and learning. This separation is evident, for example, in the customary organisation of in-service and further education for teachers, which often takes the form of individual programmes outside work, based on the idea that teachers will return and apply what they have learned (Eikeland, 2012). There are also relatively strong traditions for separating research, teaching and work. A conventional view is that educational researchers are responsible for conducting research and developing general theories that teacher educators then teach to teachers. Student teachers and teachers are expected to apply this theory in practical professional performance (Eikeland, 2012). A challenge is that such separation may entail an over-simplified understanding of how teacher competence develops. The question is whether teacher professional competence is about applying general theories in practice, as formulations about ‘applying’ or ‘testing’ what one has learned on campus may suggest (Canrinus et al., 2015; Darling-Hammond, 2017).

Challenges related to a lack of relevance and coherence may indicate that a rationalist, technical tradition of knowledge and education has been too one-sided and dominant in the understanding and organisation of teacher education. The next section explores pragmatist perspectives on relevant teacher education and the importance of collaboration between educational institutions and practice fields.

5. A pragmatist approach to teacher competence and collaboration between educational institutions and practice fields

In the following, we will examine how pragmatist interpretations of some key epistemological concepts by Wittgenstein (2003) and Heidegger (1978) can shed light on the development of teacher competence and teacher education. Such interpretations have inspired perspectives on professional knowledge (Dreyfus, 1991; Janik, 1996; Molander, 1997; Schön, 1983). Epistemological concepts by Habermas (1999) will then be analysed in relation to teacher competence and collaboration between educational institutions and practical fields.

5.1 Teacher competence and collaboration between educational institutions and practical fields in light of Wittgenstein's game metaphor

Wittgenstein's (2003) game metaphor considers our human experience as a living, playful activity. Our activities and actions are woven into existing forms of life, and cultural, practical patterns or "games". The games have a purpose, e.g. the game or practice of teaching vocational education students. Understanding the purpose of the game is a prerequisite for learning it, and it is necessary to be shown by someone who knows it. Experience involves participating in something of which one understands the purpose (Janik, 1996). Concepts and words gain their meaning through their purpose and context, e.g. through the purpose of practising the teaching profession. In light of the game metaphor, a teacher's professional competence is based on a life form or practice. Professional practice can be seen to consist of competence in a series of interconnected, related games with a fundamental purpose related to the teacher's mandate. These games are learned, understood and developed through participation in the practice of teaching.

The use of concepts, from Wittgenstein's epistemological perspective, encompasses sensory, skill-based, bodily and emotional aspects, as well as cognitive ones. Involvement, sensitivity and instinct are as important as intellectual reasoning. From this perspective, teachers' professional competence also lies in their way of seeing and listening, in their emotions, values, culture and school organisation. For example, the concept of "students' learning resources" involves values, emotions, and what one sees and does, as well as what one understands in a teaching situation.

Wittgenstein's holistic view of experience, concept development and language points to the importance of learning through examples, and to the situation or context as the central unit of meaning. It is necessary to participate in and practice the games upon which concepts are based, e.g. the professional games of teaching. The necessity of examples and demonstration does not stem from a lack of general principles and explanations. Generalisation leads to a loss of meaning (Dreyfus, 1991). The significance of examples is to provide a basis for meaning and to show the variation, for instance, in what the concept of "students' learning resources" or "adapted teaching" can mean.

To develop teacher competence, there is a need for experience and examples that illustrate professional patterns in the form of paradigmatic actions (Janik, 1996). Paradigmatic actions involve important professional tasks, such as challenges related to adapting teaching to students' learning resources, assessments that promote learning, and so on. The use of professional concepts, such as "students' learning resources" or "assessment for learning", involves a form of situational evaluation. To understand a concept is to be able to use it (Janik, 1996). In teacher education, it is essential for student teachers to have the opportunity to engage in practical situations and tasks with students/pupils, and within the school organisation, that can serve as paradigmatic examples of professional practice (Hiim, 2010).

A significant challenge in the collaboration between teacher education institutions and practical fields is to clarify the fundamental tasks and functions of the teaching profession and relate them systematically to example situations in which students can be involved. An overarching goal of this collaboration is to continuously develop a shared understanding among the actors (teacher educators, mentor teachers, students, teacher colleagues, leaders, etc.) of the "teacher's game"-of the teaching profession's and educational institutions' mandates, tasks and competence needs. This requires common meeting places where professional challenges, experiences and conceptual understandings can be shared, which is also emphasised in research on teacher education (Darling-Hammond, 2017; Munthe et al., 2015; Zeichner, 2011).

Wittgenstein (2003) rejects the idea that concepts can be defined by absolute general structures. Professional competence is not about applying general, theoretical concepts to specific situations (Janik, 1996; Molander, 1997). Student teachers and teachers need to experience professional concepts in many different, authentic contexts, such as assessing various students' learning resources, and trying out different forms of assessment, etc., in collaboration with colleagues and school leadership. Sufficient experience with various example situations is a prerequisite for developing professional competence.

From a Wittgenstein-inspired perspective, there is a need for research that provides practical examples demonstrating the significance and development of professional concepts and how key challenges can be addressed (Janik, 1996). There is a need for research-based, paradigmatic examples of professional practice. Such examples must be developed by teachers themselves, from within teaching practice, possibly in collaboration with researchers at teacher education institutions, as highlighted by Stenhouse (1975) and the English teacher research approach (Carr & Kemmis, 1986). The examples could address various current challenges related to, for instance, student assessment, vocational

and language education for minority language students, and so on. A primary aim of practitioner-based research is to develop and document professional concepts and conceptual patterns that can help strengthen the competence foundation in the teaching profession.

From a Wittgenstein-inspired perspective, experience with authentic teaching tasks or key “teacher games” is a prerequisite for developing and promoting teacher competence. Collaboration between the practical field and educational institutions involves creating an ongoing, fundamental shared understanding of both teaching tasks and the tasks of teacher educators.

5.2 Teacher competence and collaboration between educational institutions and practice fields in light of Heidegger’s workshop metaphor

Heidegger’s (1978) workshop metaphor aims to reveal structures in human experience. It compares experience to work in a workshop where everything has a function and purpose, such as building doors for a house to protect people from the weather and from danger. From Heidegger’s perspective, the use of tools and concepts is always connected to contexts and intentions that are already present in our shared culture and lifeworld (Dreyfus, 1991). Experience and learning primarily occur through participation in something we see the purpose of, as something we want, through individual and collective projects.

However, the intended purpose can be disrupted by something that does not work. For instance, the hammer might be too heavy, or the students we teach are not learning what was intended. Challenges require us to reflect on and assess the situation, leading to a more explicit understanding of the hammer and its properties, or of the students’ learning resources and how the teaching can be adjusted. Actions and concepts derive meaning from meaningful contexts and situations we are involved in, for instance as student teachers or teachers in a school. Discovering and defining problems experienced in specific contexts is a fundamental basis for learning (Dreyfus, 1991). We do not reflect on all aspects of a situation, but on challenges and problems, such as a too-heavy hammer or students who are not learning.

Heidegger emphasises that human experience is constituted by feelings, understanding and action as a whole. Feelings and values, which also have cultural aspects, contribute to defining what we engage in, see and do as teachers or student teachers within a school organisation. People involved in a practice will perceive different aspects to those who are not, and what is perceived as important will depend on the specific context or project.

In light of Heidegger’s workshop metaphor, professional phenomena and concepts have meaning in relation to functions and tasks, such as being a teacher in a school. We are absorbed in our practice, and then a problem arises that requires consideration and improvement, such as students not participating. Consideration, reflection and development of explicit concepts are based on practical challenges and the development of individual and collective practice.

From Heidegger’s perspective, it is crucial that both learning and research in teacher education are rooted in practical professional activity related to the core tasks and functions of the profession. The learning and research process starts with practical challenges and aspects that can be improved. Challenges and development opportunities related to learning and teaching can be made explicit through trial processes in which teachers’ or potentially student teachers’ and students’ interpretations are expressed in descriptions of what is being done and the various participants’ experiences throughout the process. Professional teachers’ documented experimentation and interpretation of key tasks can contribute significantly to professional knowledge. Research of teacher education also emphasises the importance of practice-based research (Darling-Hammond, 2017).

Heidegger’s workshop metaphor (1978) highlights that professional concepts are embedded in contexts of use and meaning. These concepts do not neutrally reflect given phenomena or objects, and professional practice as a teacher cannot be reduced to the application of established theoretical rules and procedures. Instead, it must be developed through engagement in practical situations, projects and interpretations, and through the development and research of individual and collective teaching practice.

From a Heidegger-inspired perspective, experience with key, authentic teaching work and challenges in the teaching profession is fundamental to the development of professional concepts. Collaboration between educational institutions and practice fields must facilitate experience-based learning and research as effectively as possible.

5.3 Teacher competence and collaboration between educational institutions and practice fields in light of Habermas' theory of communicative action

Habermas (1999) criticises pragmatic epistemology for not providing a sufficient foundation for social change. His theory of communicative action aims to develop a basis for joint critical reflection that can lead to change and improvement in our social world, such as in educational activities. The theory has inspired several teacher education researchers, including Carr and Kemmis' (1986) theory of teacher education, which centres on the idea that teachers collectively learn to develop, research and create theory about their professional practice, based on critical communicative rationality and reflection. According to Habermas (1999), critical communicative rationality is essential for making society and education function democratically.

Communicative rationality and competence involve the ability to assess the validity of verbal expressions, claims, actions and practices, such as educational practices. Fundamental validity requirements are related to four types or aspects of actions: instrumental action, conversational action, dramaturgical action and norm-regulated action. The validity criteria related to each of these are as follows:

- Is what is said and done, such as in teaching or within the school organisation, effective?
- Is it understandable for the students/parties involved?
- Are there opportunities for sincere expression?
- Is what is said and done fair?

These four types of actions and their validity criteria are encompassed within the concept of communicative action. A challenge that Habermas (1999) highlights through this concept is the tendency to reduce social activities, such as education and teaching, to a question of efficiency-of what works-at the expense of understandability, sincerity and fairness.

The concepts of lifeworld and system also shed light on significant aspects of educational practice. The lifeworld consists of cultural, social and personal traditions, perceptions and actions. Society as a system stands in contrast to the lifeworld and consists of formally organised subsystems that handle specific tasks, such as the education system. In the development and maintenance of systems, language, understanding, values and norms based on the efficient functioning of, for instance, teacher education and school systems will shape individual and collective self-understanding, relationships and practices. Social rationality can be partially reduced to instrumental rationality. Learning and teaching, for example, may be perceived unilaterally as instrumental, theory-based procedures that should be implemented, measured and objectively controlled. The need for a strengthened balance between lifeworld and system can be addressed by developing communication communities that can influence systems from within and across, contributing to change. For example, in the development of teacher education schools, practices within teacher education institutions and schools can be discussed and evaluated based on the validity criteria mentioned above.

Habermas' concept of communicative action emphasises the normative aspects of social practices such as education, highlighting that norms are created and have validity within social contexts. His principle of democracy is that a norm is valid when all parties involved can accept its consequences, such as students in a classroom or parties in a teacher education collaboration.

From Habermas' perspective, it is essential that critical communicative competence and reflection are considered fundamental aspects of teachers' professional competence. Teacher education must enhance understanding of the social, normative and democratic aspects of education, work, development and educational research. Student teachers need adequate practical experience in facilitating teaching and learning as democratic processes whereby social justice is emphasised. Social justice must be an overarching principle in student teachers' professional training and in cooperation between the parties in teacher education (Darling-Hammond, 2017).

From a pragmatic perspective, however, Habermas can be criticised for placing rather unilateral emphasis on linguistic, cognitive and general aspects of experience and knowledge. Sensory, skill-based, emotional and contextual aspects of experience, knowledge and competence are less addressed.

In the following section, the need for a holistic perspective on teacher competence and collaboration between educational institutions and practice fields will be summarised and discussed, based on the above analyses and research of teacher education. Subsequently, more specific collaboration measures will be discussed.

6. The need for a holistic perspective on teacher competence and collaboration between teacher education institutions and practice fields

The analyses above suggest that different conceptions of what constitutes professional competence will necessarily lead to different views of how it is developed and of teacher education. A unilateral rationalist, instrumental view of teacher competence and teacher education can be criticised from both a pragmatist and critical standpoint. The analyses seek to demonstrate that a conventional modernist, instrumentally oriented knowledge tradition has led to an excessive distance between teacher education institutions and schools, and thereby between educational content and professional practice. The relationship between subjects, learning environments, practice and theory appears fragmented. This also affects the relationship between professional practice, learning, education and research.

Research previously mentioned in the article indicates that there are too few, often random and poorly organised, meeting places between teacher education institutions and practice fields (Herudsløkken et al., 2019; Munthe et al., 2015). The lack of practice orientation, subject integration and practice-based research is reflected in the teaching at teacher education institutions (Sylte & Jahanlu, 2017), and students do not see sufficient connection between teaching work in the practice field and instruction on campus (Canrinus et al., 2019).

From a pragmatist perspective, teacher competence cannot be understood solely as the ability to apply given, general theories and concepts in specific contexts (Molander, 1997). It is holistic, multidimensional and dynamic, encompassing individual and collective reflection, criticism and development. Wittgenstein's (2003) game metaphor highlights experience and competence aspects related to how it is rooted in forms of life and practices characterised by participation, purpose and existential meaning. Competence is constituted by a whole of sensory, conceptual, emotional, skill-based and intellectual dimensions.

Heidegger's (1978) workshop metaphor also emphasises the holistic nature of experience, knowledge and competence. Professional phenomena and concepts gain meaning in relation to tasks, projects and practices we are involved in, which are significant to us and where we encounter challenges that help make our individual and collective understanding explicit. Teacher competence, from a pragmatist perspective, is both individual and collective, and is also constituted by the profession's and organisation's way of organising and performing practice ("the game", or "the workshop") with many unspoken structures and action patterns. Experience from teaching work plays a fundamental role in the development of teacher competence, necessitating close collaboration between teacher education institutions and practice fields.

Habermas' (1999) theory of communicative action highlights the need to focus on normative aspects of teacher competence. Continuous and systematic critical individual and collective reflection, within the school organisation and within the teacher education organisation, and across these, is, in light of Habermas, a central aspect of developing professional individual and collective competence as teachers and teacher educators.

Several influential education researchers, such as Dreyfus and Dreyfus (1986) and Schön (1983), are inspired by pragmatic and, to some extent, critical concepts of experience and competence, emphasising a holistic, multidimensional concept of competence that integrates skills, emotions and intellectual understanding. Schön uses the term "knowledge-in-action" to highlight this integration, while Dreyfus and Dreyfus use the term "skills" in a similar sense. A holistic competence concept, as outlined by both Dreyfus and Dreyfus (1986) and Schön (1983), suggests that the content and organisation of professional education and research must be based on learning and knowledge development through the individual and collective practice of professional tasks in collaboration with the practice field. Regarding newer holistic perspectives on professional education, Koenen et al. (2015), for example, define competence as an integrated set of knowledge, attitudes and skills (p. 3), stating that competence-based education is where theoretical and practical content are organised around authentic professional key tasks.

The conceptualisation of teacher competence in the STEP model can be seen as an expression of interrelated key tasks in the practice of the teaching profession (Darling-Hammond, 2006; 2017). From a pragmatic perspective, such conceptualisation is a crucial basis for anchoring education and research in teachers' work.

Considering a holistic concept of competence, it is necessary to develop coherence between professional work, learning, education, development and research in professional education, including teacher education, with work as the core. Eikeland (2012) argues for developing what he calls a symbiotic relationship between educational institutions and the practice field, to achieve such coherence. Developing this coherence is a key goal for teacher education and for the

LUSY project.

Based on the epistemological analyses and research outlined above, we will sketch some possible measures to strengthen the organisation and content of the collaboration between teacher education institutions and schools that are relevant for the LUSY project.

7. A holistic epistemological perspective on measures to strengthen collaboration between teacher education institutions and practice fields

Research on principles and measures to enhance collaboration and professional relevance in teacher education can be summarised as follows:

- Establishing teacher education schools where initiatives can be developed and tested.
- Use of standards for core teacher tasks and competences.
- Integration of subjects, pedagogy, didactics and practice, emphasising the unity between theory and practice in teacher education.

- Profession-based, practice-based research.
- Developing schools and teacher education institutions as learning organisations.
- Qualifying both teacher educators and practice teachers for professionally relevant teacher education.

These measures are also crucial for the LUSY project.

The need to enhance professional relevance in teacher education and the challenges related to established structures and educational traditions we face daily as teacher educators was a primary motivation for initiating the LUSY project as a combined innovation and research initiative.

A fundamental principle for the goals and measures in LUSY is to integrate work, learning, education and research based on a holistic, pragmatic and critical concept of teachers' and teacher educators' professional competence, as discussed above.

Against this background, the research approach for this project is action research, where we, as teacher educators, collaborate with colleagues, secondary school teachers and school leaders to investigate and develop teacher education practices (Elliott, 1999). The primary goal is to enhance the relevance of vocational teacher education through a sustained learning and research partnership between the teacher education institution and the practice field, initially involving two schools. An important aspect of the goal is to qualify ourselves as teacher educators, and the participating school leaders and teachers, through and for such collaboration. The intention is to develop and document knowledge of how the collaboration between educational institutions and practice fields can improve professional relevance. The action research approach integrates research with development, focusing on the work and practice of the participants (McNiff, 2017). The empirical data will encompass the implementation of various measures and activities within the project and the participants' experiences with these initiatives. An important task for us as project leaders will be to collect and systematise information about these experiences and to share this information with participants throughout the process, which will serve as a foundation for ongoing development (Hiim, 2010).

The initial crucial measure was to anchor the project by initiating contact between the parties, aimed at jointly developing a cooperation agreement that everyone could adhere to. A primary purpose of the process for such an agreement is to secure structural and professional support from school owners and leaders, as well as from representatives and colleagues at the schools and, importantly, within our own teacher education institution (Eikeland, 2012). A key principle is that leaders and colleagues who are directly involved are given the opportunity to assess whether and how they wish to participate, based on sufficient information. Voluntary and equitable participation in professional innovation work is essential for ensuring professional and social commitment (Habermas, 1999; Hiim, 2010). The agreement process was designed to incorporate these principles both at the schools and within our institution.

A major initiative to qualify both ourselves and our fellow teacher educators, schools and teachers in strengthening coherence in teacher education is to develop and implement a comprehensive programme for part-time, school-based practice teacher education (Darling-Hammond, 2017). The purpose of a school-based programme is to create opportunities for the school to develop as a learning organisation, with regularly allocated time and space for individual and collective reflection and learning based on experiences in professional practice (Eikeland, 2012). In Teacher

Education 2025, it is emphasised that the school as a whole—not just the individual practice teacher—is responsible for the education of new teachers (Heggen & Thorsen, 2015; Norwegian Ministry of Knowledge, 2017). Student teachers need both teaching experience and experience from contributing to a learning organisation.

A major concern is to develop a curriculum for the school-based education of practice teachers. The plan must be developed and specified in collaboration with the relevant school(s) through representatives of school leaders, union representatives and teachers/practice teachers, as well as colleagues at the teacher education institution. Some key questions to help develop such a plan, from a pragmatic perspective, are: what constitute the core responsibilities of professional teachers? Which tasks must professional teachers be able to perform, understand and justify? (Darling-Hammond, 2006; Koenen, 2015). How must teacher education be organised and structured both on campus and at the teacher education school, to qualify student teachers for these tasks? And further:

What are the core tasks of practice teachers and the school organisation in the education of new teachers? What should the content of practice teacher education include, and how should it be organised? How can the work of the school and practice teachers, practice teacher education, the development of the school as a learning organisation, and related research be integrated? It is necessary for teacher educators on campus and teachers/practice teachers and leaders at the school to discuss these questions together and, based on this, develop a curriculum plan for practice teacher education.

Some general principles that may be essential to uphold in practice teacher education can be outlined, but they must be specified in collaboration with the participants. First, it will be necessary to view this education as a meeting place for teacher educators from campus and practice teachers/teachers from the school, where collaboration to strengthen both supervised professional training and teaching on campus is a topic for dialogue and development between the parties. From a pragmatic perspective, there is a need to emphasise the student teachers' experience with authentic teaching work as a key foundation for competence development and content in teacher education. An essential theme in the practice teacher study will, therefore, be how to strengthen preparation, follow-up and post-work of student teachers' internships in ways that contribute to integrating practice, pedagogy, didactics and subject matter (Darling-Hammond, 2017; Munthe et al., 2015).

Furthermore, it is necessary to ensure that participants in the study gain authentic experience from guiding student teachers and colleagues. This experience can be used as a basis for individual and collective reflection and can be systematically related to general theories and literature concerning professional guidance in teacher education (Korthagen, 2011).

Dialogue conferences at the schools that are aimed at individual and collective learning and development will also be a key activity in the school-based education of practice teachers (Eikeland, 2012). This must be planned in close collaboration between us as teacher educators, school leaders, union representatives and teachers. A main theme for such a conference will be: what are the key challenges in our professional work at the school? What do we want to do better or develop further? How can we do the best work and learn from each other? At such a conference, it will be relevant to identify areas and projects to work on, learn from and explore, both individually and in groups, and to plan further development work and sharing of experience.

For school-based education of practice teachers to contribute to both the development of individual professional competence and school development, it is, from a pragmatic perspective, necessary for participants to learn to conduct research into their own practice based on action research methodology (Darling-Hammond, 2017; Elliott, 1991). This entails the ability to identify challenges in one's own work, and to conduct and document development and improvements in a systematic and research-based manner in close collaboration with colleagues, students and other stakeholders (Hiim, 2010). Key tasks for teacher educators will be to guide practice teachers/teachers in their development projects and to bring in relevant literature and theory related to the projects. Furthermore, it is important that results from the various projects are collected, analysed as a whole, and fed back to both the school organisation and the teacher education institution as a basis for further learning and development (Melby, 2022). Such a collaborative approach entails integrating the development and research work of the school/teachers and teacher educators, ensuring that the research is grounded in both the teachers' and teacher educators' practices.

To strengthen collaboration and coherence between teacher education institutions and schools, there is a need for internal dialogue conferences within the teacher education institution, and for cross-institutional conferences between teacher education and schools (Eikeland, 2012). These forums can set the collaboration agenda and discuss possible

development measures, including those related to study programmes at various levels, including master's and PhD levels, educational provisions in schools, and research and development work. To realise the guidelines for collaboration in L 2025, there is also a need to make the organisational structures between the parties more flexible. This might include establishing exchange programmes and various forms of combined positions for which teachers and teacher educators have assigned tasks at each other's institutions, or creating positions for doctoral students focused on the practice field (Norwegian Ministry of Education and Research, 2017).

An important measure will also be to establish a group with representatives from both parties to continuously ensure ongoing collaboration between teacher education schools and the teacher education institution. Schools that have become qualified by completing a school-based practice teacher education programme will have much to contribute to such a group, and so will teacher educators who have actively participated in such education. The group's mandate will be to manage permanent, yet flexible structures and content for collaboration on the following: student teachers' supervised professional training at the teacher education school, programme descriptions and educational provision, organisational learning, and research and development work. An important principle will be that the collaboration should be characterised by equality between the parties and that student teachers should be involved (Habermas, 1999). Such a group is necessary to ensure lasting and dynamic collaboration, and to ensure that qualifying as a teacher education school and partner for such a school becomes a living process, not a completed project.

8. Conclusion

The epistemological analyses in this article suggest that close collaboration and coherence between educational institutions and the practice field, anchored in students' practical professional experience, are crucial for relevant teacher education and the development of teachers' professional competence. Problems with relevance arise when on-campus education and students' practicum are separated, and when the educational content is fragmented into school subjects, pedagogy and didactics without clear connections to each other and to practice, as has traditionally been the case, based on the idea that theoretical concepts can be learned in isolation and applied in practice.

From a pragmatic, holistic perspective, authentic experience from professional practice is a fundamental prerequisite for understanding the purpose of the teaching profession and the nature of its key tasks. The content of teacher education must be structured around and based on participation in professional tasks. To a far greater extent, research must also be grounded in teaching practice and aimed at developing professional concepts, including by facilitating teachers individually and collectively to conduct research within their practice.

It is necessary to establish permanent structures for dialogue and collaboration between teacher education institutions and the practice field. The dialogue must be aimed at developing a shared understanding of what key teaching tasks involve and what needs to be learned to professionally perform, justify and critically develop these tasks together with colleagues and students. Collaboration between the parties must be continuous and based on democratic principles of equal participation.

School-based practice teacher education can be a starting point in establishing a teacher education school and can serve as a concrete, initial joint project between teacher education institutions and the practice field. The goal will be for both parties to qualify together through and for cooperation on student teachers' practice, educational programmes, school development and research, aimed at strengthening the grounding of teacher education in professional tasks and experience.

From a pragmatist, critical perspective, professional teacher work, learning, education, organisational development and research can be integrated in holistic processes in which the work is fundamental. Recognising the value of professional experiential knowledge and the significance of professional work for the development of professional concepts and theory can be considered a basic principle in relevant teacher education and collaboration between educational institutions and the practice field. Darling-Hammond's question can be reframed from "What do teachers need to know and be able to do?" to "What do teachers need to be able to do, understand and explain?"

Acknowledgements

We gratefully acknowledge the support from the Norwegian Research Council.

Conflict of interest

The authors declare no competing financial interest.

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