Gerard Doetjes · Vlatka Domović · Mirjamaija Mikkilä-Erdmann · Katja Zaki *Editors*

RESEARCH

Coherence in European Teacher Education

Theoretical Models, Empirical Studies, Instructional Approaches

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1 Introduction: Teacher Education in Europe – Coherence through Collaboration?

Gerard Doetjes, Vlatka Domović, Mirjamaija Mikkilä-Erdmann and Katja Zaki

Questions about what constitutes good, coherent teacher education (TE) are as contentious and universal as the challenges of teacher education itself. Around the globe and across Europe, education policy makers, researchers and educators are addressing local structures, programs and approaches to global issues and challenges. In this context, one problem that is often identified is the fragmentation of teacher education programs into individual phases, domains, and actors, which results in discontinuities as well as gaps between theory and practice. These gaps lead not only to a structural problem for teacher education, but also create an obstacle to the successful training of young teachers: Fragmented structures and a perceived lack of practical experience in the course of study lead to a situation in

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which student teachers often perceive their education as little coherent, practice-orientated and meaningful. Accordingly, in some cases, student teachers find it difficult to establish links between the individual parts of their studies and are thus also prevented from developing a holistic professional competence, which requires the integration and elaboration of different sources of knowledge as well as the development of a professional identity and the accompanying motivational and self-regulatory competencies.

Apart from a rather weak coherence between educational structures and concepts within national TE systems, transnational coherence appears to be particularly weak: The substantial diversity between European TE systems represents a central barrier for the mobility of teacher students and educators. A transnational approach to the issue seems promising in two ways: a systematic comparison of TE structures and concepts in the participating institutions will provide deeper insights into current paradigms of coherence orientation in European TE. Building on this, the joint development and evaluation of teaching concepts and learning opportunities for student teachers is paramount if the internationalization of TE is to become a reality in the future.

Against this background, the ConnEcTEd (Coherence in European Teacher Education) consortium was founded in 2019 and funded for three years in the context of an Erasmus+ strategic partnership grant. ConnEcTEd aimed at the enhancement of coherence in European teacher education in a collaborative way and through a transnational setting: By creating transnational communities of practice, the project partners worked on eight interlinked work packages that focused on different aspects of coherence, namely: Mapping coherence (IO1), Disseminating coherence (IO2), Sharing good practices of coherence (IO3), Measuring coherence (IO4), Co-creating Open Educational Resources (OER) on coherence between theory and practice (IO5), Co-creating OERs on coherence between theory and practice (IO6), Internationalizing the teacher education curriculum (IO7) and a Digital toolkit for transnational collaborations in teacher education (IO8).

The project consortium aimed at building a joint understanding of the notions of coherence, at co-creating means and methods on how to enhance program coherence and the sense of coherence among students as well as the development of instruments for the evaluation and measurement of the latter. As a working definition within the project, the creation of "coherence" was understood as the creation of learning opportunities in which references are created vertically (over the course of study) and horizontally (across the various courses of subject science, subject didactics, and educational science) that enable students to experience their studies as coherent and meaningful. Coherent learning opportunities

can be characterized, for example, by curricular and conceptual links between different areas of professional knowledges and/or their subdisciplines, by personnel cooperation across the pillars of teacher education (e.g. subject science and subject didactics), by theory–practice links, or by instructional-psychological teaching–learning formats that create meaning and relevance, also in connection to the teacher profession and/or development of the professional identity of the students. These learning opportunities demand an explicit linking of the different areas of knowledge. The interconnected knowledge structures should enable competent professional action and be evident in subsequent teaching practice, and they should be perceived as such by teacher students. The creation of coherence should therefore be considered as an essential measure of innovation for the further development of teacher training programs and the promotion of teaching professionalism.

The outcomes of the ConnEcTEd IOs are manifold, with teacher educators, student teachers, teachers, and other stakeholders of TE as target groups. The creation of transnational coherence through a jointly developed vision of European TE, coherent teaching–learning scenarios, the use of innovative practices in the digital era, and a mutual recognition of qualifications and learning outcomes, will hopefully broaden the perspective taken on coherence so far and enable more physical and virtual mobility for students and staff in the future. Thus, the consortium aimed at promoting coherence in and across individual and locally grounded TE systems through the strengthening of conceptual, consecutive and transnational coherence at all participating partner universities as well as the collaborative structures and formats between them.

The developed products are freely available for participating universities, and will be disseminated to the public. Beside the project webpage, which can be consulted under (https://www.face-freiburg.de/connected/) and hosts further information on the project, the present joint volume is one of the core final outputs of the project work. It is comprised of theoretical models, empirical studies and conceptual approaches from the collaborative project work as well as from associated colleagues and initiatives.

In the following we briefly describe the volume's individual contributions, covering theoretical, empirical and practical aspects of coherence in teacher education:

In the first chapter, entitled **"The (in)coherence of European teacher education: A comparative mapping of policies at national and institutional levels"**, authors Vasileios Symeonidis, Katharina Hellmann and Michelle Laux discuss similarities and differences in policies related to lifelong professional development of teachers in five European countries which includes governance, phases

(initial teacher education, induction and teacher professional development), content and domains of professional knowledge. The findings reveal incoherence within and between the analysed teacher education systems and point to the need for further efforts by all stakeholders in both the development of coherent national teacher education systems and the development of a common understanding of coherence in a transnational context.

Subsequently, the chapter by Mirva Heikkilä and Hege Hermansen provides a theoretical contribution for understanding **epistemic coherence in teacher education**. Starting from a brief discussion of the different notions of coherence, the authors focus on knowledge integration and elaboration among student teachers who need to integrate professional knowledge from different domains and establish connections between theory and practice. The authors argue that there is a need to analytically highlight what they coin as *epistemic coherence*, which is understood as the relations between the different forms of knowledge that exist in a teacher education program. They discuss the latter in the context of structural, conceptual and institutional approaches to coherence.

Although experts in initial/pre-service teacher education may assess study programs as conceptually and structurally coherent, the perspective of students of their study experience may differ from the perspective of program developers. In the chapter titled **"Exploring Finnish student teachers' perceived coherence on their teacher education program",** Mirjamaija Mikkilä-Erdmann, Julia Nummi and Norbert Erdmann investigate how Finnish class and subject student teachers experience the coherence of their study program and self-efficacy in teaching. Their results reveal that Finnish student teachers perceive their program as rather coherent and feel prepared for teacher profession.

Vlatka Domović, Željka Knežević and Lidija Cvikić, in the chapter **"Coherence in initial class teacher education in Croatia – Student teachers' perspective",** analyse prospective class teachers' perspective on the coherence between different parts of the study program (content knowledge, pedagogical-content knowledge, general pedagogical knowledge and school-based practice). The study shows that prospective class teachers in their final year of study estimate that the connectedness between the analysed parts of the program is not in accordance with the expectations of the experts who developed the program. Steps are proposed to improve coherence in the program.

Cindy De Smet and Christine Schmider assess **student perceptions of professionalization measures and coherence after the 2011 French curriculum reform** which restructured French teacher education. The reform followed a competence-based teacher education model and European guidelines inspired by the Bologna process. A new MA teacher education program was developed at the University

of Nice between 2015 and 2019. The study provides insights into students' perceptions of the interlinking of theory (disciplinary and didactical courses) and practice that was in the focus of the reform targeting the professionalization of teacher education.

The chapter "**Co-constructing multidisciplinary coherence in subject teacher education: Students' reflections in group discussions"** by Anssi Roiha and Pilvi Heinonen investigates how student teachers co-construct the understanding of multidisciplinary learning and how they see their teaching subject in relation to multi-/inter-/transdisciplinarity. The chapterbrings up interesting issues of coherence in teacher education because it discusses questions related to the development of students' transversal competencies (which is part of numerous national curricula for primary and secondary schools) and the attitudes and competencies of prospective subject teachers for strengthening the development of these competencies in their students.

The paper by Deborah Carrai and Ida Hatlevik, **"Exploring coherence between teacher education and the competence required to facilitate students' oral participation in foreign language classrooms"**, explores if and how newly qualified Spanish as a foreign language teachers perceive coherence between their newly concluded teacher education program and their own acquired professionalism. The study focuses on the facilitation of oral activities in the classroom. For their analysis, they build on a qualitative case study that is divided into two phases: a non-participative observation of foreign language teachers during their Spanish class (with a focus on oral production and participation) as well as subsequent interviews with the teachers on their perceptions of classroom activities.

The chapter **"Perceptions of coherence among teacher education students and newly qualified teachers of foreign languages. An exploratory Norwegian-German study"** by Gerard Doetjes and Katja Zaki covers an exploratory interview study among teacher education students and newly qualified teachers (NQTs) of foreign languages in Norway and Germany. The contribution starts with a sketch of the theoretical foundations, followed by an outline of the chosen methodology—a qualitative approach with semi-structured interviews in a transnational setting—and a discussion of selected findings. In this context, a comparison according to cohorts and location of education attempts to shed light on curricular conditional factors and to deduce questions for further research.

In the contribution **"Coherent research-based teacher education curriculum supporting student teacher learning"**, Auli Toom and Jukka Husu outline the importance of coherent research-based curriculum for supporting student teacher learning for the teacher profession. After elaborating on the characteristics of

teachers' work and the essential key capabilities based on current research, they discuss the complexity of student teachers' learning of the mentioned core capabilities as well as the role of teacher education pedagogies in it. Finally, they suggest future considerations for supporting both student teachers' learning as well as teachers' learning in the profession after the pre-service education. They stress that the enhancement of key capabilities for teachers' work requires a variety of meaningful theoretical and practical studies and activities, versatile support, as well as continuous reflection and feedback.

The following chapter by Riitta-Leena Metsäpelto, Anu Warinowski, Anna-Maija Poikkeus and Mirjamaija Mikkilä-Erdmann discusses the process of building coherence in teacher education through a teacher competence model, titled **"Multidimensional Adapted Process Model of Teaching"**. The model, specifying the key competence domains perceived to be critical for the teaching profession and depicting them as a comprehensive teacher competence model, was published in 2021. It is a collective interpretation of the current evidence base and the prevailing discourses on what teachers should know and be able to do. After sketching recent trends in the Finnish educational landscape, the contribution discusses to what extent the model has increased or may increase different notions and levels of (structural and conceptual) coherence in teacher education.

The chapter **"Identifying core practices as a framework for cooperation and development in teacher education"** by Gerard Doetjes and Ida Hatlevik showcases an interdisciplinary cooperation between two teacher educators—one educational scientist and one foreign language didactics lecturer—at the University of Oslo. After sketching the theoretical foundations of how core teaching practices can be a common denominator to enhance structural and conceptual coherence across teacher education programs, the authors describe how an observation-based approach, structured by a focus on core practices, can contribute to a closer connection between pedagogy and subject didactics in teacher education.

The chapter **"Coherence through cultures of remembrance? A design-based research project at the intersection of cultural and literary studies, subject didactics and school practice"** by Frank Reiser and Katja Zaki discusses the adaptability of the 4C/ID instructional design model for a coherence-oriented teaching format at the intersection of subject sciences, subject didactics and school practice. After a brief overview of the context of foreign language teacher education in Freiburg, instructional foundations and the implementation cycles of the IMS are presented. The initial evaluation results are then discussed. Initial findings indicate significant effects in terms of coherence construction and perception among students, but also reveal challenges and limitations of the co-taught

task-based format (e.g. an above-average workload). Furthermore, a bidirectional dependence of course and program coherence is stressed, and the transnational transferability of course designs across local and national contexts is discussed.

The concluding **discussion—"Coherence – The what, the why, and the how"—**is written by Esther Canrinus, whose research has substantially contributed, both theoretically and empirically, to the current research on coherence in teacher education. She discusses the lessons learnt from the volume's chapters and rounds off the publication by detailing new and future directions for research on teacher education.

We hope that this volume enhances the discourse and research on coherence and thereby also inspires co-operation in European teacher education. Finally, we would like to thank all of the authors who contributed to this volume, our copy editor Andrew Johnson for the meticulous proofreading, and Esther Canrinus for her thoughtful and thorough discussion. Furthermore, we are particularly grateful to the EU for the financial support without which this publication would not have been possible.

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The Editors

2 The (in)coherence of European Teacher Education: A Comparative Mapping of Policies at National and Institutional Levels

Vasileios Symeonidis, Katharina Hellmann and Michelle Laux

Abstract

In the past twenty years, the quality of teacher education has received growing attention in Europe with national governments seeking to reform their teacher education systems with the objective of improving students' learning outcomes. A central aspect of such reform efforts is the improvement of coherence of teacher education in terms of interlinking phases, actors, contents of teacher education, and professional knowledge domains. The aim of this chapter is to map contemporary policies related to coherence across teacher education systems of different European countries in order to identify convergences and divergences. The study was developed in the context of an EU funded project that involves seven universities from five countries. Data were gathered via two qualitative questionnaires focusing on aspects of governance across the continuum of teacher education and the organisation of initial teacher education (ITE) programmes at universities. Findings reveal an incoherence within and across teacher education systems, particularly regarding the continuum of teacher education. Although the structure and duration

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of ITE proves coherent, the distribution of knowledge domains and contents differs significantly among countries.

Keywords

Coherence • ConnEcTEd • European teacher education • Policy mapping

2.1 Introduction

The value of teacher education (TE) for teacher quality and student learning outcomes has been thoroughly documented in recent years (Barber & Mourshed, 2007; Hattie, 2009; Madalinska-Michalak, 2023; OECD, 2005). At the education policy level, TE is increasingly conceptualised as a system that includes all phases of a teacher's lifelong learning, spanning from initial teacher education (ITE) to teacher induction and eventually to continuing professional development (CPD) (Darling-Hammond et al., 2017; Hellmann, 2019; Roberts-Hull, Jensen & Cooper, 2015; Symeonidis, 2021). In the context of the 'knowledge society', as advocated by most international organisations and supranational entities, teacher preparation is not considered complete when prospective teachers graduate from university, even if the role of ITE is acknowledged to be important (European Commission, 2015; OECD, 2005). Teachers are expected to develop their professional competences throughout their whole career. However, the focus of TE reforms worldwide has been predominantly directed towards ITE (Mayer, 2021).

As a relatively new study area, ITE joined the traditional academic and professional areas during the emergence of mass higher education. Previously, it was mainly located in institutions outside universities which were under direct state control. The gradual "universitisation" of ITE was the result of integrating ITE colleges into universities, raising qualification standards beyond the undergraduate level, and moving towards research-based ITE (Zgaga, 2013). This initial phase of teacher preparation is crucial as it enables future teachers to gain a profound professional knowledge base and professional competences over time to deal with the increasingly complex and challenging demands of the teaching profession (Herzog & Makarova, 2014).

Assumptions and objectives towards a quality TE across the continuum are, however, contrasted with the reality of a rather fragmented area within the higher education landscape and beyond. Fragmentation in TE is generally defined as a systematised, yet not necessarily envisaged, division of structures, professional knowledge domains (here: content knowledge (CK), pedagogical content

knowledge (PCK), pedagogical knowledge (PK); Shulman, 1987), studied subjects, theory–practice experiences, phases of the professionalisation process and a general experience of discontinuities throughout one's studies (Cramer, 2020; Hammerness, 2006; Kotthoff & Terhart, 2013). In several countries, the structural and contextual problem of a fragmented TE has led to an increased attention towards the concept of "coherence" which is assumed to be a helpful guiding principle for the development of quality TE in terms of interlinking phases, actors, contents of TE, and professional knowledge domains (Canrinus et al., 2015; Hellmann et al., 2021).

Still, the concept of coherence remains vaguely defined and understudied in the context of TE, particularly when it comes to transnational coherence between TE systems. This is important to note as efforts towards the Europeanisation of TE, comparability of professional qualifications, and internationalisation of curricula have been made for some time now (European Commission, 2018; Kotthoff & Denk, 2007; Symeonidis, 2021). The main goal of such initiatives is to allow for an increase in the transnational mobility of both student teachers and teachers, which continues to remain low compared to other professions (European Commission/EACEA/Eurydice, 2021), and to enable lifelong learning based on international standards and requirements. Against this background, this chapter aims to undertake a comparative mapping of policies related to coherence across TE systems of different European countries in order to identify convergences and divergences that can inform a transnational understanding of coherence in European TE.

2.2 Literature Review

2.2.1 Coherence in Teacher Education

The guiding principle of "coherence" in TE is mostly used as an umbrella term and includes various approaches towards types of structural and/or content-related alignment, linking or cooperation. Mostly conceptualised for ITE at higher education institutions, coherence is supposed to enable future teachers to see their studies and practical experiences as structurally and contextually meaningful both vertically (across phases of the university professionalisation process, as well as between theory and practice) and horizontally (between different professional knowledge domains of TE, representing CK, PCK, and PK) (Hellmann, 2019). Efforts to create coherence are usually made to overcome fragmentation and

experiences of discontinuities, thus facilitating the acquisition of integrated professional knowledge (Hammerness & Klette, 2015; Harr et al., 2015; Shulman, 1987) and of professional competences (Hellmann et al., 2021). The overall aim is to better prepare future teachers for the demands of professional practice (Zeichner, 2010), but also to enable them to develop their profession continuously and autonomously (European Commission, 2015).

It is important to note that coherence in TE can be discussed from both an offer/supply and a use side. The first (offer side) conceptualises coherence as a *creation of "coherent" structures and learning opportunities* by relevant stakeholders which are presented to learners; the second (use side) focuses on *effects* of these learning opportunities on students' knowledge and competence gains (Cramer, 2020; Hellmann et al., 2021). In the following, we focus on the offer/supply side of coherence.

The principle of coherence can be applied not only to university ITE but also to teacher induction and CPD (Hellmann, 2019; Stéger, 2014), hence stressing the need for alignment and coordination over the entire continuum of teacher education. Coherence is increasingly understood as a dynamic and continuous process—rather than a state—that can only be initiated through coordination from relevant actors (e.g. European Commission, 2015; Hammerness, 2006) and has to be continuously negotiated at an institutional level (Hermansen, 2019). The following quote is indicative of how the European Commission (2010) conceptualises the continuum process in TE:

> This professional development of teachers is a lifelong process that starts at initial teacher education and ends at retirement. Generally this lifelong process is divided in specific stages. The first stage concerns the preparation of teachers during initial teacher education, where those who want to become a teacher master the basic knowledge and skills. The second stage is the first independent steps as teachers, the first years of confrontation with the reality to be a teacher in school. This phase is generally called the induction phase. The third phase is the phase of the continuing professional development of those teachers that have overcome the initial challenges of becoming a teacher. (European Commission, 2010, p. 6)

Creating a coherent continuum for TE thus requires the mutual exchange of information of content and the coordination of activities through individual and institutional collaborations of all actors involved in the different phases. At the systemic level, coherence can be achieved "by building induction on the professional outcomes of ITE in a bridging manner so that it prepares teachers for a career-long professional learning" (Stéger, 2014, p. 339). A coherent integrated approach means that every phase gives feedback to the previous one and

is contributing to the phase which follows in order to enhance quality (European Commission, 2015; Stéger, 2014). Within this context, governance of TE systems should be based on collaborative approaches that involve all relevant stakeholders, including providers of ITE and CPD, professional bodies and associations, and social partners in the processes of decision making, steering, and monitoring of the system (European Commission, 2015). To facilitate the collaboration and dialogue along the continuum, teacher competence frameworks can also prove helpful (European Commission, 2018).

Regarding TE stakeholders, being located in different and independent subject departments, faculties, institutions and in different phases of the profession, thus pursuing a multitude of goals, implies that fragmentation and a lack of coherence is often the natural status quo at universities. Beyond that, stakeholders of TE do not necessarily have the need to agree on aspects of the profession as their respective areas of work (e.g. recruitment, university subjects, practical phases, assessments) are functioning independently from each other and only need to be brought together by teachers during professional practice itself. Thus, constant communication and permanent adjustments with all stakeholders—not to mention institutional conflicts—are inevitable and moreover a requisite to achieve program coherence at universities (Hermansen, 2019; Levine et al., 2023) and coherence regarding teachers' professional life (European Commission, 2018).

Although "coherence" as an umbrella term is widely used regarding coherent *offers* in ITE, there is a great variability regarding implementations in certain university phases and subjects (e.g. aligned curricula, linked learning-opportunities, interlocked theory–practice experiences). As a result, "coherence" can initially refer to anything, starting from professional knowledge domains, curricula and contents, phases, theory–practice proportions, actors, educational policy aspects of TE/professionalisation, governance structures, integrated knowledge, gained professional competencies and/or beliefs of teachers, among others (Canrinus et al., 2015; Hammerness, 2006; Hellmann et al., 2021; Muller, 2009).

2.2.2 Exploring Coherence from a Transnational and Collaborative Perspective

Some conceptual and empirical work focusses on national concepts of coherence in TE systems (e.g. Hellmann et al., 2021 (for Germany); Lilliedahl et al., 2020 (for Sweden)). Also, some attention has been paid to discussing comparative approaches towards coherence in TE (e.g. Canrinus et al., 2015; Canrinus et al.,

2019; Darling-Hammond et al., 2017; Flores, 2017; Jenset et al. 2018; Lindvall & Ryve, 2019; Nordine et al., 2021).

Little emphasis, however, has been placed on working collaboratively and transnationally on best practice and disseminating this best practice into the various TE systems. The large diversity of already fragmented incoherent national TE systems represents a central barrier for collaboration and dissemination of good practice, obscuring the goals of the European Higher Education Area (EHEA) such as the promotion of mobility, the comparability of degrees, and the promotion of the European dimension in higher education (Council of Europe, 2023). Therefore, a transnational approach to the issue of coherence in TE seems promising in two ways: A systematic comparison of TE structures and concepts in different systems and institutions could provide deeper insights into how the concept of coherence is currently implemented in respective countries. Building on this, a joint development and evaluation of teaching concepts and learning opportunities in TE could be initiated.

The ConnEcTEd project ("Coherence in European Teacher Education—Creating transnational communities of practice through virtual scenarios "), funded by the European Union's Erasmus+ programme (2020–2023) and implemented within the framework-guidelines of "Key Action 2: Cooperation for innovation and the exchange of good practices" and"Strategic partnerships for higher education", envisages the reduction of the above mentioned discrepancies through both conceptual and empirical work that compares different TE systems and structures and, based on this, looks in detail into conceptions and underlying motifs of "coherence". By means of identifying convergences and divergences between the different TE systems and ITE programmes, new possibilities for the creation of coherence between the different systems can be derived. Furthermore, good practice regarding ITE teaching and learning opportunities can be developed, disseminated, evaluated, and adapted for each national system.

To this end, a transnational team of seven universities from five European countries (Croatia, Finland, France, Germany, Norway) agreed to cooperatively work on these aspects. The aim of this collaboration was the joint development of innovative practices (e.g. regarding teaching concepts, learning opportunities, learning communities) and empirical measures for evaluating these newly developed learning opportunities (e.g. student perceptions of coherence in their ITE). The ConnEcTEd project also established transnational professional learning communities, which provide knowledge about European TE systems and offer access to professional training opportunities (e.g. video-tutorials, virtual scenarios). In the long run, these transnational and collaborative efforts can enhance the European TE and contribute to the goals of the EHEA, which are particularly

challenged in the context of ITE (for Germany, see: Kotthoff & Symeonidis, 2021).

2.3 Methods

Among the first objectives of ConnEcTEd was to map how coherence is currently manifested in the different national TE systems of the countries involved in the project. It was considered essential to develop common conceptual ground on which the transnational cooperative activities and developments could take place during the project. Thus, a macro comparative perspective was adopted to examine educational policy frameworks, national and/or regional given factors, institutional contexts, and practices regarding coherence. The comparative study design aimed to identify, structure, describe and analyse similarities and differences between TE systems of the ConnEcTEd countries, focusing on two dimensions that can enable vertical and horizontal coherence respectively. Our design was informed by the Teacher Education and Development Study in Mathematics (TEDS-M), the first large-scale empirical comparative study that systematically compared the structure, curriculum, and processes of teacher education programmes in 17 countries (Ingvarson et al., 2013), without however focusing on coherence.

The first dimension of our comparative study was the *governance* of TE systems across the continuum, including information about the different phases of TE, the official requirements for becoming a teacher, the various actors involved in each phase, and the existence/role of teacher competence frameworks in interconnecting the different phases. Although the collected data enabled the description of the TE systems at a given point in time, rather than an in-depth analysis of the interconnection between the different phases, we envisaged tracing the role of policy actors and instruments back to the vertical coherence of the systems. The second dimension was related to the *structural characteristics* of ITE, with a focus on the ECTS credits allocated for the different professional domains, allowing for a discussion of the horizontal coherence of ITE programmes, and taking into account some of the organisational aspects identified by TEDS-M (Ingvarson et al., 2013) . For the first dimension, data illustrate the picture at the national level, while for the second dimension, data draw from policies at specific ITE institutions within a country (i.e. the institutions participating in the ConnEcTEd project), acknowledging that ITE might differ significantly from institution to institution even within the same country. At the outset, it should

be mentioned that the study focused on the school sectors of primary and general secondary education, which constitute compulsory schooling in all countries examined.

The primary source of data for this mapping exercise was gathered via two qualitative questionnaires with open-ended questions that were answered by project coordinators and team members at each university participating in ConnEcTEd. Project coordinators were TE experts with more than 10 years of research experience, supported by a team of senior and junior researchers. The two questionnaires aimed to complement each other, meaning that after the first questionnaire was completed in January 2021, its analysis indicated that additional data were necessary, so that a second questionnaire was subsequently disseminated to all partners and completed in May 2022. The first questionnaire contained a range of questions about the governance and organisation of TE, selection of student teachers and recruitment/employment of teachers, phases/stages of TE, institutions/actors involved in TE, domains of teachers' professional knowledge, and teaching practice. The second questionnaire aimed to complement information regarding the structure of TE programmes, domains of teachers' professional knowledge, and admission requirements. In total, 6 questionnaires were returned in each of the two questionnaire rounds, with two questionnaires providing information about the same country, namely Finland. Each of the other 4 questionnaires documented developments in Croatia, France, Germany, and Norway respectively.

The completed questionnaires were reviewed by the project team at the University of Education Freiburg and any remaining issues were clarified through individual online meetings with the partners. The responses gathered emphasise different issues that seem to be relevant within a country's given institutional context. Further, some partners experienced difficulty in providing detailed information about the actors involved in TE and the domains of teachers' professional knowledge. We therefore decided that these empirical data should further be complemented and cross-examined through a desk study of international reports and policy databases, including the European Commission's Eurydice database and the OECD's Teacher and Learning International Survey (TALIS) as well as relevant international and national policy reports. The data were first analysed separately for each country and then comparatively synthesised based on the above mentioned dimensions. The comparative synthesis is illustrated in Tables 1 and 2.

Table 1 Governance of teacher education systems across the continuum

Country	Selection to ITE	Official requirement for becoming a fully qualified teacher	Induction Phase	Recruitment	Continuing professional development	Actors/Institutions	National teacher competence framework in place
Croatia	State matriculation exam & university entrance exam (at some faculties)	Professional license exam is required after the completion of the induction period	Compulsory after ITE, 1 year (mentoring provisions in place)	By the school (Civil servants)	Professional duty (required for career advancement as teacher mentor, teacher advisor or teacher excellent advisor)	Ministry of Science and Education, the Education and Teacher Training Agency, Universities, NGOs, Schools	National framework of qualification standards for teachers in pre-tertiary education

(continued)

Table 1 (continued)

Country	Selection to ITE	Official requirement for becoming a fully qualified teacher	Induction Phase	Recruitment	Continuing professional development	Actors/Institutions	National teacher competence framework in place
Finland	State matriculation exam or written entrance exam (for entrance to a subject faculty of university, & aptitude interview (for the pedagogical studies (subject teacher ed.))	Successful graduation from ITE (MA degree, 60 ECTS of pedagogical studies and sufficient subject studies)	Recommended but not compulsory (tutoring by school/ colleagues if offered)	By the school, but hired by the municipality (Civil servants)	Three planning and development days (18 h) mandatory for all per year	Ministry of Education and Culture, Universities (with a faculty/department of education), University Teacher Training school, Teacher training schools, field school networks	There is no national competence framework in place
France	BA degree	Success in a competitive examination (CAPES) is required in addition to completion of ITE	Compulsory, attached to ITE, 1 year	By the state, following a competitive examination (Civil servants)	Professional duty, without an official framework in place	School of Education (Inspé), Education authority (Rectorat), Schools	National framework of competences for teachers and education professions

(continued)

Table 1 (continued)

Country	Selection to ITE	Official requirement for becoming a fully qualified teacher	Induction Phase	Recruitment	Continuing professional development	Actors/Institutions	National teacher competence framework in place
Germany	Grade point average (Abitur) (plus aptitude test, according to subject and university-specific regulations based on demand)	Completion of the "Refendariat" (teacher induction phase)	Compulsory, attached to ITE (18–24 months, according to regional regulations)	By the school or the federal state/ subordinate authorities ("Schulamt") (Civil servants or employees)	Compulsory in many federal states, optional in others	State Ministry of Education (Länder), joint conference of ministries of education of the Länder ("Kultusministerkonferenz"), School authorities (Schulämter), Universities, Universities of Education, Schools, Centres of teacher education	National standards for teacher education
Norway	Grade point average for 5y programmes BA or MA + 60 ECTS in one or two school subjects for 1 year post-BA or MA	Successful graduation from ITE is the only requirement	Recommended but not compulsory	By the school, but teachers are on the municipality payroll	Optional	Ministry of Education, Universities, Schools	National standards for teacher education (not legally binding)

Table 2 Structural characteristics of ITE programmes at universities

Country	Programme-Type	Consecutive/ concurrent	Duration (years)	Grade Span	Specialization	Domains
Croatia (Zagreb)	MA in Primary Education BA/MA in Secondary Education	Concurrent (Integrated BA + MA) Consecutive/ Concurrent	5 3 + 2 or 5 + 0	1–4 (ISCED 1) 5–12 (ISCED 2 + 3)	Generalist (6 subjects) Specialized (1 or 2 subjects)	CK + PCK: 250 ECTS PK: 50 ECTS PK + PCK = 55 ECTS as minimal requirement

(continued)

Table 2 (continued)

Country	Programme-Type	Consecutive/ concurrent	Duration (years)	Grade Span	Specialization	Domains
Finland (Helsinki, Turku)	BA/MA in Primary (Class Teacher) Education BA + MA with Subject Teacher Education	Concurrent Consecutive	3 + 2 3 + 2	1–6 (ISCED 1) 1–6 (depends on subject) 7–9 10–12 (ISCED 1 + 2 + 3) (general teacher qualification for all levels from Gr 1 to adult education) 1–9, 10–12	Generalist (15 subjects) Specialist (1–3 subjects)	BA: General studies + Language and communication skills: 24 ECTS CK: 60–62 ECTS PK + PCK: 60 ECTS Minor studies: 36 ECTS MA: CK: 60 ECTS PK + PCK: 80–87 ECTS BA + MA: First subject: 120 ECTS of CK Second or additional subject: 60 ECTS of CK Pedagogical studies for teachers (Subject Teacher Education): PK + PCK: 60 ECTS (~20* ECTS for teaching practice at schools, *number of ECTS varies a little from university to university)

(continued)

Table 2 (continued)

Country	Programme-Type	Consecutive/ concurrent	Duration (years)	Grade Span	Specialization	Domains
France (Nice)	BA/MA in Primary school Education BA/MA in Secondary school Education	Consecutive Consecutive	3 + 2 3 + 2	1–5 (ISCED 1) 6–12 (ISCED 2 + 3)	Generalist Specialist (1 subject)	BA: CK: 180 ECTS MA: CK + PCK: 64 ECTS PK: 56 ECTS MA: CK: 40 ECTS, PK: 40 ECTS, PCK: 40 ECTS

(continued)

Table 2 (continued)

Country	Programme-Type	Consecutive/ concurrent	Duration (years)	Grade Span	Specialization	Domains
Germany (Freiburg)	BA/MA in Primary school Education BA/MA in Secondary general school Education BA/MA in Grammar school Education	Concurrent Concurrent Consecutive	3 + 1 (2nd Master year as „Referendariat“) 3 + 2 3 + 2	1–4 (ISCED 1) 5–10 (ISCED 2 + 3) 5–12/13 (ISCED 2 + 3)	Generalist (2–3 subjects, but teach all) Specialist (2 subjects) Specialist (2–3 subjects)	BA + MA: PK: 60, CK + PCK: 120 ECTS Internships: 36 ECTS, Other: 24 ECTS BA + MA: PK: 57 ECTS, CK + PCK: 174 ECTS, Internships: 36 ECTS, Other: 33 ECTS BA + MA: PK: 39 ECTS, CK + PCK: 214 ECTS, Internships: 22 ECTS, Other: 40 ECTS
Norway (Oslo)	BA/MA in Primary school Education BA/MA in Primary and lower Secondary school Education BA/MA in Secondary school Education BA/MA + Post-MA in Secondary school Education	Concurrent Concurrent Concurrent Consecutive	5 5 5 3 + (2) + 1 (some require only BA)	1–7 (ISCED 1) 5–10 (ISCED 1 + 2) 8–13 (ISCED 2 + 3) 5–13 (ISCED 1–3)	Generalist (4 subjects) Generalist (3 subjects) Specialist (2 subjects) Specialist (1 or 2 subjects)	5-year-program (PK MA): CK: 150 ECTS, PCK: 120 ECTS; PK: 30 ECTS 5-year-program (CK MA): CK: 240 ECTS, PCK: 30 ECTS; PK: 30 ECTS Post-MA: PCK: 30 ECTS, PK: 30 ECTS

2.4 Results

2.4.1 Governance of Teacher Education Across the Continuum

The continuum perspective of TE implies that ITE is just the beginning of a teacher's lifelong learning which continues with early career support through induction and moves on to CPD for teachers. However, the provision of different continuum phases proves to be uneven across the EU, particularly regarding induction and CPD. Table 1 illustrates how TE systems in the ConnEcTEd countries are organised and governed across the continuum. Already the selection of students for ITE programmes varies depending on programme type (i.e. consecutive or concurrent), but general admittance to a BA-programme is necessary since ITE takes place at higher education institutions across all countries examined. Admittance depends on students' academic performance which is demonstrated by the results of state matriculation exams (Croatia, Finland, France) or the grade point average awarded to students at the end of high school (Norway). In Germany, some federal states conduct centralised final exams, while others conduct school-based exams.

In addition, some university faculties in Croatia require entrance exams, while Finland asks for an aptitude test that aims to gauge the non-academic qualities of prospective teacher candidates, including their motivation, commitment, interpersonal and communication skills. At the University of Helsinki, such an aptitude test entails three parts: a written test based on the analysis of articles, an interview designed to understand the motivation for becoming a teacher, and a 90-min practical process in which applicants are given a pedagogical task to perform in front of the admissions committee.

Some countries prove to be more selective with the admissions of their teacher candidates than others. While some universities in Finland may admit fewer than one fifth of all applicants to their ITE programmes, universities in Germany and France often admit more than two thirds of all applicants. This higher admittance rate can be explained by the increasing rates of teacher shortages, particularly in STEM subjects, and the declining number of student teachers (e.g. at the University of Education Freiburg, 60% of available study places for secondary school ITE remained vacant in the summer semester of 2023). The lack of attractiveness of the teaching profession in these countries, compared to other professions with similar duration of studies such as law or medicine, is further exacerbating this trend. In the case of Finland, however, making teaching a highly attractive profession by ensuring attractive working conditions and high professional status

allows ITE institutions to be highly selective so that the best students compete for admittance to the teaching profession (Darling-Hammond et al., 2017; European Commission, 2018). After selection, ITE becomes increasingly homogenous among the ConnEcTEd countries in terms of structure and duration, as outlined in detail in the following section.

Completing ITE is the only requirement for becoming a fully qualified teacher in Finland and Norway. In all other ConnEcTEd countries, there are additional requirements for both primary and general secondary education teachers, often attached to the completion of a mandatory teacher induction phase which takes place either within the framework of ITE (e.g. France, Germany) or after ITE has been completed (e.g. Croatia). Specifically, France includes a competitive examination (Certificate of aptitude for secondary school teachers, CAPES) that takes place at the end of year 4 (i.e. the first year of MA), after which an induction programme is provided to successful candidates who work as trainee civil servants during the second year of their MA. In Germany, a one to two year preparatory service at school (*Vorbereitungsdienst,* or *Referendariat*) is considered induction and is a requirement of the German ITE, although candidates will have already graduated with a MA degree by the time they begin. One year of teacher induction is also mandatory in Croatia, after which a professional license exam is necessary to be fully qualified. In Finland and Norway, teacher induction is recommended, but not compulsory. Across the countries examined, we can argue that teacher induction, when existing in a formalised way, takes the form of an on-the-job qualifying phase which is considered as an extension to ITE, rather than as an independent phase in its own right (with the exception of Croatia) that would bridge ITE and CPD in a way that newly qualified teachers would receive personal, social and professional support and would be actively initiated in a lifelong learning process. As such, it is also not possible to discern whether teacher induction provides feedback to ITE.

Having received full qualifications, teachers can be fully employed at schools and acquire a status as civil servants. In France, teachers are employed by the state, in Croatia by the school, in Germany by the federal state or the school, and in Finland and Norway by the school but are paid by the municipality. In the context of their employment, teachers may be required to undertake CPD. This is the case in Finland where the collective agreement sets three days for CPD and planning per year, and in France where the law defines CPD as teacher duty and an element of teacher evaluation. In Croatia, Germany, and Norway, CPD is optional but considered important for teacher career advancement. The duration, format, and status of CPD varies significantly among countries, as it is organised: at the school level or outside of the school, by the government,

the school or private providers, during teachers' regular workload, and/or as paid study leave. CPD proves to be the most turbulent phase across the continuum of TE in terms of regulation, planning and monitoring. Although becoming an increasingly important policy priority, the lack of coordination and planning at a governmental level leaves CPD detached from the other phases of the continuum.

Overall, it can be argued that the administration and governance of the TE continuum is rather fragmented, since a multitude of actors is involved in each phase, without standardised and/or effective mechanisms for communication in place. In each of the ConnEcTEd countries, the government defines the rules for the different phases of TE, and particularly for ITE, without necessarily conceptualising and strategically planning TE as a coherent continuum. In Croatia, France, Germany and Norway, the government defines national competence frameworks for teachers, which is mainly used for the development of ITE curricula. Specific competences or standards remain the same and are not differentiated according to the different stages of a teacher's career; they are also not used for teacher appraisal in schools. The purpose of establishing teacher competence frameworks is thus limited to ITE and not utilised to interlink and enhance the coherence of the different continuum phases.

Since ITE has moved to the university level, the autonomy of higher education institutions has influenced how ITE is organised in a country, as well as the extent to which ITE is interlinked with the phases of teacher induction and CPD. Moreover, micropolitical tensions within universities often contribute to higher levels of fragmentation for ITE as different subjects and pedagogical departments tend to continuously strive for a higher merit in the allocation of credits for themselves. However, the "School of Education"-model, a distinct institutional structure for organising the professional and pedagogical domains of ITE, has recently emerged as a viable solution for governing ITE in some countries, with examples being the *Institut national supérieur du professorat et de l'éducation* (Inspé) in France and the School of Education (FACE) in Freiburg, Germany. TE centres are also organised within universities, mainly managing the school practice of student teachers. The university-school partnership becomes an increasingly important priority, but mainly relates to ITE and stops at later phases of the continuum. CPD is the phase with most actors involved, including, for example, the government, private providers, NGOs, universities, and schools.

2.4.2 Organisational Characteristics of ITE Programmes

2.4.2.1 Structure of ITE Programmes

Since the beginning of the Bologna Process in 1999, all ITE programmes in the countries examined (Croatia, France, Germany, Finland, and Norway) were gradually converted to the BA/MA system. The aim was to create a transparent qualification profile throughout Europe, a simplified recognition practice and thus, higher mobility opportunities (Dicke, 2007). Depending on the type of school and location, the different programme types differ in terms of specification, level, and orientation and can be structured consecutively or concurrently. *Consecutive* is understood as a division into two phases: usually a university degree with specialisation in a particular subject is followed by a separate programme oriented towards pedagogical content and practical phases. In contrast, programme types that integrate both subject-related and pedagogical content into ITE at the same time are referred to as *concurrent* (Ingvarson et al., 2013). While many international programme types can be clearly assigned to consecutive or concurrent organisational forms, the ConnEcTEd countries predominantly offer mixed forms or combinations of both structures (see Table 2).

For example, TE in France is basically structured as consecutive, but also integrates a pedagogical specialisation at an "École Supérieure du Professorat et de l'Éducation" in cooperation with the corresponding university. A majoritively subject-specific BA degree with this additional pedagogical course is followed by the teaching-specific MA degree MEEF (Métiers de l'Enseignement, de l'Éducation et de la Formation). Nevertheless, it is also possible to transfer to MEEF with the ECTS credits earned in the first year of another MA degree and a required selection test. In contrast to the primary school teaching profession (grade 1–5), where one subject is studied in the BA degree and various others in the MA degree, the focus in secondary education (grade 6–12) is always on one subject.

Similar opportunities to opt for the teaching profession at a later stage exist in Norway. Even though most of the different programme types (primary: grade 1–7, primary and lower secondary: grade 5–10, secondary: grade 8–13) are basically competing combinations of subject-specific science, pedagogy and didactics, it is also possible to complete a teaching-specific postgraduate programme (grade 5–13) after a MA degree in another subject and thus obtain a teaching qualification with the help of the consecutive alternative pathway. Teachers who teach up to grade 13 specialise in one or two subjects—all others study three or four subjects as generalists.

In Finland, students have the possibility to choose between isolated concurrent (grade 1–6, up to 15 offered subjects) and majority consecutive models (grade 1–12, 1–3 subjects). In the latter, after one or two years of subject studies, one additionally applies for "Subject Teacher Education", i.e. the specific path of studies for the teaching profession.

Both its federal system and the organisational characteristics of the respective university result in considerable differences in Germany, which also includes individual school types. Although primary (grade 1–4, two or three subjects) and secondary school TE (grade 5–10, two subjects) are structured concurrently, grammar school (*Gymnasium*) TE (grade 5–13, two or three subjects) has consecutive structures since the introduction of the new study regulations in 2015. For example, the former *Gymnasium* teaching degree, which bore a teaching degree title but was almost exclusively subject-specific with a very small proportion of educational science content, has now been restructured and bears a general degree title with a teaching option. This means that a subject-specific BA degree is followed by an MA degree which is specific to the teaching profession.

In Croatia, a distinction is made between primary school teaching (1st–4th grade) and secondary school teaching (5th–11th or 12th grade). While primary school teachers are prepared as generalists for all six subjects during their concurrent studies, secondary school teachers specialise in one or two subjects. The study programme is consecutive: a subject-specific three-year BA degree is usually followed by an MA degree which is specific to the teaching profession. Professionals who have graduated from a relevant faculty (e.g. engineers of mathematics) can be employed in schools as subject teachers as well. They are obligated to complete a special program of pedagogical training (including school pedagogy, educational psychology, didactics, subject-specific teaching methodology, and practice) before or during their first year of service which enables them to obtain a teacher qualification. This special program is organised at teacher education faculties.

2.4.2.2 Domains of Knowledge

Regarding the proportions of CK, PK, and PCK, very different approaches are taken in the various countries—the decisive factor in this respect is on the one hand whether consecutive or concurrent programme types are involved. On the other hand, the type of school also has an influence on the distribution of the respective domains: while the PK-share usually dominates at the primary school level, the CK-share is higher at the secondary school level. To a large extent, the respective knowledge domains are distributed in relatively unequal proportions. An exception is the French MA where domains are divided exactly into

thirds. While the CK-specific content is mainly taught at the university, Inspé is responsible for PK teaching and PCK is done by in-service teachers. Special team-teaching with a field tutor and an Inspé/university tutor is intended to promote the decompartmentalisation of competences and domains.

In Norway, the distribution of domains depends strongly on the respective programme type. In addition to the aforementioned distinction between the consecutive option with the one-year teaching-specific post-MA programme (mainly for secondary schools), there are also different domain emphases in the MA in Oslo with the competing five-year programme (for secondary schools). Students thus have the option of choosing between a PCK-MA or a CK-MA. In the latter, subject-specific content is correspondingly high at 240 ECTS (in relation to the total study of 300 ECTS). In comparison, the subject-specific didactic content of the PCK-MA programme is just half, at 120 ECTS. This makes clear that the subject-specific area always accounts for the largest share, even when the respective focus is set. Students who have already completed a subject-specific study have the possibility to add a one-year postgraduate teaching programme, in which the PCK and PK components are represented with 30 ECTS each. Regarding school practice, the five-year programmes provide at least 100 days or 20 weeks, the one-year post-master 60 days or 12 weeks.

In Finland, a general distinction between the class TE programme for primary level (generalists for grades 1–6) and the subject TE programme (qualification to teach at all levels of schools with sufficient subject studies) is made. The latter is a three-year subject-specific BA degree followed by a two-year MA degree with one year of pedagogical studies (60 ECTS in total) with two teaching practices (20 ECTS) at a teacher training school or field school. An additional 25 ECTS are allocated to subject didactics and 15 ECTS to studies in education. In relation to the entire BA and MA programme (300 ECTS), the proportion of subject studies is at least 120 ECTS. A share of language and communication studies and career skills (10 ECTS each) as well as IT and data management studies (3 ECTS) is also required. Furthermore, a qualification in a minor subject can be acquired (min. 60 ECTS). These data refer to the Helsinki model, however the distribution may vary depending on the location.

In Germany, due to the distinction between school types in secondary education, there are clear differences in respective ITE programmes, which greatly depend on the federal state and university location. While in Freiburg the proportion of PK in the primary and lower secondary level is 60 and 57 ECTS respectively (in relation to the entire study programme), it is significantly lower for the *Gymnasium* (i.e. grammar school) teaching degree with 39 ECTS. Looking at subject sciences, a corresponding number of ECTS is expected regarding

the level and type of school (primary school: 120, secondary general school: 174, grammar school: 214)—the PCK component is already included here. Probably the greatest difference refers to the practical component: A one-semester school internship is expected in all three study programmes; remarkably, this is only credited with 16 ECTS in the *Gymnasium* teaching degree—in contrast to primary and secondary education with 30 ECTS. Furthermore, one year of the 1.5-year induction period (*Referendariat*) is already integrated in the primary ITE programme, which ultimately means an overall one-year shorter training period.

ITE in Croatia also shows a relatively diverse distribution in terms of programme types. In primary school TE programmes, PK and PCK account for a share of 250 ECTS, while 50 ECTS are provided for PK. While the BA degree in secondary education is purely subject-specific, the MA degree must have a minimum of 55 ECTS credits of PCK and PK-related content (depending on the implementing faculty, this proportion can also be higher).

2.5 Discussion and Conclusion

The mapping exercise aimed to illustrate convergences and divergences of TE policies across the ConnEcTEd countries in view of informing a transnational understanding of coherence in European TE. To this end, coherence was studied as the sum of all concepts and measures aimed at interlinking phases, actors, contents of TE, and professional knowledge domains.

With regard to interlinking the phases of the continuum, it can be argued that the focus of policymakers has mainly been on reforming ITE, rather than developing a comprehensive strategy for a teacher's lifelong learning. Within each country examined, the continuum remains fragmented, while a comparison among the different TE systems reveals that the notion of teacher induction and the value of CPD are conceptualised differently. Induction, for example, might be conceptualised as a second stage of ITE, as an autonomous phase in its own right, or as an optional vaguely defined institutional policy measure. CPD is often missing an institutional framework, is considered optional, and might not always be attached to teacher evaluation. Transnational coherence would hereby require a commitment to a teacher's lifelong learning and a common understanding regarding the purpose of each phase.

The multitude of actors involved in the different phases of the continuum further reveals the need for coordination and transparent communication. Coordination of actors, at least in the context of ITE, is increasingly envisaged through

the establishment of institutional megastructures, such as the School of Education in Freiburg or Inspé in France, which bring together the actors involved in TE and develop school-university partnerships. However, their impact on improving coherence and the quality of TE has not yet been studied. Similarly, several TE systems have defined national teacher competence frameworks which remain focused on ITE and are not upgraded or even considered in the other two phases of the continuum. Their potential to facilitate the dialogue along the continuum (European Commission, 2018), thus, remains idle.

Although the Bologna Process has evidently led to convergences regarding the architecture of ITE programmes, there are still several differences in the organisation of ITE programmes across the countries examined. Except for France, all other countries offer both consecutive and concurrent programmes—sometimes even, as is the case of Norway, for the same type of school. Concurrent programmes are predominantly targeting the primary school sector and educate generalist teachers, while consecutive programmes are designed for subject specialist teachers who will work in secondary education. Depending on the programme type, the distribution of knowledge domains might also vary. For example, consecutive programmes often include a higher proportion of CK compared to concurrent programmes.

Regarding the duration of studies, the introduction of BA and MA degrees with their ECTS scales has created a certain level of transparency and harmonisation. In almost all countries examined, ITE for both primary and secondary education is completed after a five-year standard period of study. The only exceptions are the one-year post-MA programme in Oslo and the four-year primary school programme in Freiburg. However, direct entry into the profession is only possible—as in Croatia, France and Germany—after completion of the respective compulsory one to two-year induction phases. Far-reaching differences in ITE regarding grade span result from the respective school systems of the countries: while in Germany (Freiburg) and Croatia primary school lasts just 4 years, in Norway it is 7 years. At the same time, the grade span for secondary education can extend up to the 13th year of schooling in Norway and Germany.

Since both the designation and the combination of knowledge domains are handled differently in the individual countries, a comparison proves to be difficult. For example, CK and PCK are often combined, thus allowing more credits for PK. There are also different approaches as to how ECTS for practical internships are calculated (e.g. in Norway, the practicum is considered an add-on without ECTS allocation). Overall, an important issue proves to be the balance between CK, PCK and PK, which of course depends on the number of subject disciplines that a teacher should be able to teach.

To conclude, the mapping exercise revealed an incoherence within and across TE systems, particularly when it comes to interlinking and governing the different phases of the continuum. Although the structure and duration of ITE proves increasingly coherent across countries as a result of the wider Europeanisation process (Symeonidis, 2021), the distribution of professional knowledge domains differs significantly among them.

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Epistemic Coherence in Teacher Education

3

Mirva Heikkilä and Hege Hermansen

Abstract

This chapter presents the concept of epistemic coherence and discusses its implications for researchers and practitioners in teacher education. Epistemic coherence is conceptualized as an emergent achievement comprising two key components: a) student teachers creating relations between a range of knowledge resources or modes of knowledge production and b) student teachers creating personal relationships with professional knowledge. This analytical approach can help move beyond conceptualizations of a theory–practice gap and other dichotomies that characterize existing research on knowledge use in teacher education and serve to open up the black box of how knowledge relations are constructed in teacher education.

Keywords

Coherence • Epistemic coherence • Knowledge practices • Teacher education

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3.1 Introduction

In this chapter, we present the concept of epistemic coherence and discuss how it can be of use to both researchers and practitioners in teacher education. We understand epistemic coherence as an emergent achievement comprising two key components: a) student teachers creating relations between a range of knowledge resources or modes of knowledge production and b) student teachers creating personal relationships with professional knowledge. We propose that this analytical approach can help us move beyond conceptualizations of a theory–practice gap and other dichotomies that characterize existing research on knowledge use in teacher education and serve to open up the black box of how knowledge relations are constructed in teacher education.

Our point of departure is that a defining characteristic of professional work is the need to integrate multiple knowledge resources in order to solve practical problems (Lehmann, 2020a; Muller, 2009). Previous research has argued that knowledge integration across different domains and forms of knowledge constitutes "an integral part of professional development, professionalism, and competence" (Lehmann, 2020b, p. 1). Teachers draw on a diverse range of knowledge sources, including knowledge about their respective school subjects, subject didactics, pedagogical knowledge, human relations and mental health, organizational knowledge of the school sector, and knowledge about specific student groups, their families, and the community surrounding the school (Hegarty, 2000; Shulman, 1987). When teachers make decisions that inform their everyday work, they constantly assess the various knowledge sources in relation to both each other and the task at hand. The integration of different knowledge sources is, therefore, an inherent aspect of teachers' professional practice.

This epistemic diversity is also a key characteristic of teacher education. Teacher education programs draw on a diverse range of knowledge sources, including knowledge about school subjects (e.g., mathematics, history, languages or chemistry), subject didactics, pedagogical and psychological knowledge, and a broad range of practical skills. In addition, teacher education programs combine the two learning arenas of universities and school, which are characterized by different sets of institutional practices and logics (Hedegaard, 2014) and different conventions for developing and safeguarding knowledge (Knorr Cetina, 1999).

It follows that a key task for teacher education is to prepare student teachers to deal with this epistemic diversity in a competent manner. This means that student teachers should be able to create relations between different knowledge resources as well as different modes of knowledge production in order to address problems of practice. Epistemic coherence also requires that student teachers build

personally meaningful and agentic relationships with professional knowledge, thereby enabling them to foster their professional identities in a sustainable manner (Heikkilä, 2022). However, these characteristics of teachers' work and their implications for teacher education remain under-theorized. The current chapter aims to address this gap in the existing research.

In the field of teacher education, we need a conceptual apparatus for understanding how teachers deal with this epistemic complexity and the dynamics underlying their work in order to relate different knowledge resources to each other. Because knowledge is often perceived as abstract and immaterial, it can remain hidden from view unless the complexity is made visible. Much attention has been paid to the need to "relate theory and practice," but it remains unclear how this is actually done. There is also a need to overcome dichotomies that are dominant in much of the literature and, instead, focus on the processual aspects, which can be unpacked from a relational perspective.

3.2 Perspectives on Coherence in Teacher Education

There is a longstanding challenge of designing for coherence in teacher education (Canrinus et al., 2017; Hatlevik & Smeby, 2015; Jenset et al., 2018; Risan, 2020; Sjølie & Østern, 2021; Zeichner, 2010), and existing research provides several concepts that describe different aspects of coherence. These include structural and conceptual coherence (Hammerness, 2006), biographical, transitional, and program coherence (Hatlevik & Smeby, 2015; Smeby & Heggen, 2014), and institutional coherence (Hermansen, 2019).

Some of these concepts—such as structural, transitional, and program coherence—analytically foreground program characteristics. These constructs help conceptualize the interrelationships between different program components and the ways in which these relations may support or obstruct student learning. Other concepts, such as conceptual and biographical coherence, relate primarily to actors' perceptions and experiences. Such constructs help us examine the ways in which teacher educators' perceptions might inform program design and the extent to which student teachers experience a program as coherent. Finally, the notion of institutional coherence allows us to conceptualize the relationship between instantiations of program design and the institutional contexts of higher education institutions. In this chapter, we introduce the concept of epistemic coherence to show how student teachers can learn to construct meaningful relations between different knowledge resources and a personal relationship with

professional knowledge. These relations emerge when they define the role that different forms of knowledge should play in an educational setting.

Teacher education is characterized by curricular divides between academic disciplines and subjects and educational foundation and methods courses as well as a major separation between university and school as two distinct learning arenas (Sjølie & Østern, 2021). University teachers and practitioners responsible for student teachers during placement occupy separate and distinct modes of logic and epistemic beliefs (Hatlevik & Smeby, 2015). Previous research indicates that students experience classroom instruction and field placement as two very different learning arenas, where different forms of competence matter (cf. Hatlevik & Smeby, 2015). Thus, student teachers may have difficulty grasping the relevance of theoretical knowledge in teachers' work because the two contexts carry different institutionalized practices relating to the types of knowledge that matter. Thus, it is not easy for student teachers to develop a sense of epistemic coherence. Previous research on student teachers', university teachers', and practicum supervisors' evaluations of coherence in different professional education programs also indicates that teacher education programs may face greater challenges than other programs in terms of linking theory to practice (Hatlevik & Smeby, 2015).

Different learning arenas generate different perspectives about knowledge, and thus, knowledge acquired by student teachers must be recontextualized to become useful in practical work (Hatlevik & Smeby, 2015). Previous research has illustrated how student teachers actively engage in knowledge work as they tailor knowledge for their own purposes and adapt it in the transition from one institutional context to another (Heikkilä, 2022). Recontextualizing knowledge entails the ability to create meaningful relationships between different types and aspects of knowledge (Hatlevik & Smeby, 2015). This cannot be left exclusively to student teachers; fostering epistemic coherence is a matter for everyone working in and for teacher education.

In the existing literature, challenges in building these personal relationships have often been verbalized through the concepts of theory and practice—a dichotomy usually represented through the gap metaphor. In discussions around the theory–practice gap, theory usually means educational theories and research-generated knowledge taught in teacher education, whereas practice generally refers to teachers' practical work in classrooms (Hermansen, 2020; Korthagen, 2010; Leijen et al., 2015). In general, the notions of theory and practice date back to Aristotle's three-fold classification of human activity as consisting of theoretical action, productive action, and practical action, which were later elaborated in several ways (Mahon et al., 2020).

In the field of teacher education, a conceptual separation between theory and practice is popular but questionable (Hordern, 2019). Many scholars have documented that students struggle to construct relations between theoretical knowledge and professional practice (e.g., Jenset et al., 2018; Puustinen et al., 2018) as it causes problems for student and newly qualified teachers in terms of linking theories to their work (Leijen et al., 2015). The focus has often been on the question of how practice can be better linked to theory rather than vice versa (Korthagen, 2010). It has also been pointed out that simple dichotomies between theoretical knowledge and practical skills are inadequate in understanding the challenges of providing professional education (Smeby & Heggen, 2014). Instead, the concept of coherence has been proposed as an appropriate way to bring into focus the complexity of the meaningful interrelationships between theory and practice (Smeby & Heggen, 2014).

Some researchers have claimed that the problem labelled as a "gap" between theory and practice may derive from a lack of a shared understanding between student teachers and teacher educators (Sjølie & Østern, 2021). It may be that teacher educators are unable to connect to student teachers' personal experiences. In the same vein, some have argued that teachers as practitioners should have more control and specialized knowledge—and thus theory—assumes greater value (Hordern, 2019). In addition, some researchers have claimed that a narrow use of the term "practice" as what happens in the classroom, and making this the focus of a problem-solving research paradigm, mistakenly places it as the opposite of theory (Hodgson & Standish, 2009). Thus, rather than treating theory and practice as mutually exclusive, there is an increased focus on how different forms of knowledge are intertwined in specific situations of professional practice.

Helping student teachers build personal and agentic relationships with professional knowledge entails that theory and practice should not be presented as opposites. Theory and practice are not static or passive entities; both involve action and arouse further action. First, educational theories and research-generated knowledge are created in ongoing processes by academic researchers. In this activity, policy affects researchers, causing them to find balance between autonomy and control and creativity and accountability (Jacob & Hellström, 2018). Thus, how "theory" in the field of teacher education evolves is shaped by the possibilities afforded to teacher educators to engage in research. Second, similarly, practices in schools are constantly being shaped every day. Thus, educational practice is not merely habitual practice and routine action in everyday human activity; it involves moral action and is formed through history (Mahon et al., 2020). Therefore, the issue of theory and practice in teacher education seems to be much more complex than what is often assumed.

However, rejecting the notion of a "gap" does not imply that the relationship between theory and practice should be conceptualized as seamless (Kvernbekk, 2012). Theoretical development is a worthwhile academic pursuit in itself, free of allusions to practice (Kvernbekk, 2012), including in the field of education. When theoretical knowledge is related to professional practice, a more pertinent question is not how to "bridge the gap" but, rather, what kinds of relations might emerge as teachers, student teachers, or teacher educators work on problems of practice. Thus, we maintain that the "theory–practice gap" should not be viewed as a homogenous and static phenomenon. Instead, the relationship between theoretical knowledge and professional practice can be conceptualized as a generative and dynamic relationship with characteristics that are highly context-dependent. The concept of epistemic coherence aims to unpack some of these dynamics.

In the next sections, we outline our conceptualization of epistemic coherence with a focus on its two main elements: the creation of relations between different knowledge resources and the creation of personal relationships with professional knowledge.

3.3 Epistemic Coherence as Creating Relations Between Different Knowledge Resources

Previous research on knowledge integration has distinguished between research traditions that adopt a cognitive-psychological viewpoint, and those that view integration as a form of situated activity in which knowledge is applied towards specific tasks (Lehmann, 2020b). Drawing upon the latter tradition, this section outlines a conception of epistemic coherence that analytically foregrounds *how different knowledge resources are placed in relation to each other in order to address a specific task or problem.* A key assumption is that coherence in teacher education and teachers' professional practice can only be understood in the context of specific tasks or problems of practice. The task—or problem—is what provides different knowledge resources with integrative force and informs how relations can be constructed. In teacher education, such tasks can include student teachers collaboratively working on a case analysis, analyzing curriculum documents, or undertaking a research and development project as part of their practicum period. For teacher educators, such tasks could include lesson design, curriculum development, or providing formative feedback on student teachers' texts.

All tasks require the use of different material and conceptual artefacts (Cole, 1996), which are here referred to as knowledge resources (Hermansen, 2017). In teacher education, such knowledge resources include theories, scientific concepts,

models (for example, to support reading skills or for curriculum development), research articles, national or local curricula, lesson plans, assessment rubrics, reflection logs, case descriptions, multimedia representations of professional practice in schools, or simulated learning environments. These knowledge resources typically emerge from varied forms of knowledge production: some resources are produced through research (such as research articles and scientific concepts), while others are produced through professional practice in schools (such as reflection logs or teaching materials created during practicum periods in schools). Epistemic coherence is about creating relations *between these modes of knowledge production* as well as *between the different knowledge resources* that emerge from these processes.

Knowledge resources are not "neutral" but are characterized by a set of constraints and affordances that shape how they can be put to use in teacher education. For example, a scientific publication will often provide concepts and theoretical perspectives that can help student teachers expand their understanding of professional practice. However, such publications are unlikely to offer detailed "recipes" of how professional practice is to be carried out in the classroom because this kind of knowledge resource tends to be abstract and decontextualized (Hermansen and Mausethagen, 2016). Conversely, the experience-based knowledge of particular students is often essential to addressing challenges related to classroom management and social relations in a given classroom. However, such knowledge can be more difficult to generalize to other classrooms and other school settings.

In short, the role that a given knowledge resource might adopt in addressing a problem of practice depends on its characteristics. It follows that student teachers need to learn to analyze the affordances and constraints of specific knowledge resources. An important responsibility for teacher educators, therefore, is to support student teachers' capacity to assess the potential that different knowledge resources offer. Students should be able to identify the use scenarios that can be associated with specific knowledge resources. However, such potentials do not *determine* actual use, and student teachers can also invest knowledge resources with distinct purposes and characteristics.

The task or problem at hand informs how such purposes and characteristics are defined. For example, a journal article about how to support at-risk students may take on very different roles in a) a learning activity for student teachers; b) a research project conducted by teacher educators; and c) a school-based development project for in-service teachers. For student teachers, the main purpose of this article may be to develop their understanding of how to support at-risk students. In a research project run by teacher educators, the article may form a point

of departure for developing *new* understandings of at-risk students that challenge existing theoretical perspectives and practices. In a school-based development project, the article may act as one of several resources that allow teachers to critically examine and further develop their existing practices with at-risk students. Hence, the potentials of specific knowledge resources are realized in a mutually constitutive relationship to the task at hand.

Because the role of knowledge resources is not predetermined, interpreting and assessing their potential is an integral part of professional agency. The creation of relations between different knowledge resources *requires analytical and creative work*. As student teachers or teacher educators work to relate different knowledge resources to a given task, they will need to exercise professional discretion and critically evaluate the potential function and purpose of specific knowledge resources. Some key questions in this process include: What can these knowledge resources offer to address a specific task? What can they *not* offer? How can they be adapted to better suit the task at hand? How can they be placed into a fruitful relation with other knowledge resources? An important part of this assessment is to consider how different knowledge resources can *interact* to address a given problem.

In teacher education, creating relations between such knowledge resources is an inherent part of everyday activity. For example, student teachers may be asked to analyze a case description from professional practice in the light of learning theories, develop assessment criteria based on insights from existing assessment research and an assessment task developed at a local school, or apply educational theories, knowledge of school subjects, and experience-based knowledge from practicum periods in curriculum development. In all of these examples, the interplay between different knowledge resources needs to be carefully considered, both by teacher educators (in the design of the task) and by student teachers (as they complete the task).

For teacher educators, assessing the interplay between knowledge resources and relating them to specific purposes can be considered an integral part of curriculum design and enactment. For example, Risan (2020), in her doctoral work, exemplified how teacher educators work to create relations between what she described as artefacts related to theory and practice. She examined how teacher educators invest these artefacts (or, in our terms, knowledge resources) with specific meanings. For example, in a lesson on how to support the development of writing skills, one of the teacher educators that Risan observed used a research article and a tool for practitioners called ‘the wheel of writing’, which supports teachers to identify different dimensions and purposes of writing exercises. The

teacher educator assigned these resources with a range of purposes in the professional development of her student teachers. First, she used these knowledge resources to instruct student teachers in how to teach writing skills, using the 'wheel of writing' to operationalize the insights from the research article into specific classroom practices. Second, she used these knowledge resources to express and justify her criticism of how writing skills are generally taught in schools, contrasting her view of established approaches with the practices represented by the research article and the practical tool. Third, she used the research article to model her own trajectory of professional development as it relates to the teaching of writing skills, explaining to the student teachers how her exposure to research has changed her own teaching approaches. Finally, she used these knowledge resources to construct a specific kind of teacher professionalism that she urged the student teachers to adopt. In short, she used her agency and professional discretion to create multiple relationships between the research article and different aspects of professional practice, both at the individual and collective levels.

Another teacher educator in Risan's study, who was teaching a lesson on how to provide formative assessment, provides a contrasting example of how knowledge resources can be related to a problem of practice. In her lesson, she used three knowledge resources: research articles on formative assessment, examples of school pupils' writing, and her own formative assessment of the pupils' texts:

> Nina asks student teachers to read two sets of anonymised pupil texts and her feedback for the first and the final version of the texts. The feedback has been removed from the pupil texts, and the student teachers are asked to find out where the teacher feedback belongs: "You are going to look at the first draft, my feedback, and the final text. I have removed the feedback from the text, so you have to find out where in the texts you think the feedback belongs. Do we think that the formative assessment, that research claims is so good, has had any effect?" (Risan, 2020, p. 7).

Creating a relation between the research article and the examples of school pupils' writing, the teacher educator encouraged the student teachers to critically assess key insights from research on formative assessment in light of the examples she provided from her own professional practice. In contrast to the previous example, in which the research article on writing skills is employed as an example of 'best practice', this teacher educator positions the research articles as knowledge resources that can be critically explored in the light of professional practice.

In both examples, very different choices could have been made by the teacher educators. For the current purposes, the point is not whether these examples show "good" or "bad" teaching practice. Rather, they are analytically interesting because they illustrate teacher educators' professional discretion in terms of *how*

the knowledge resources were related to specific tasks and in terms of the *inter-relationships* created between instantiations of research and professional practice. In this case, we also do not know whether the student teachers themselves experienced these relations as meaningful, which is important for student learning. In the next section, we therefore proceed to look at epistemic coherence as a way of creating personal relationships with professional knowledge.

3.4 Epistemic Coherence as Creating Personal Relationships with Professional Knowledge

Another key element in developing epistemic coherence is that student teachers as well as other actors related to teacher education create personal and agentic relationships with professional knowledge. These relationships contribute to epistemic coherence by strengthening agency and professional identity in teachers' approaches to knowledge resources. Fostering these relationships helps take control of knowledge resources and the role they should play in professional work.

To help student teachers create personally meaningful relationships with professional knowledge, they should be involved in knowledge-creating processes themselves. The aim of research is usually understood as creating and bringing new knowledge into the world. Thus, the role of research in teacher education programs is an important issue for epistemic coherence.

There have been worldwide efforts aimed at improving the research base of teacher education (Afdal & Damşa, 2018; Afdal & Spernes, 2018; Darling-Hammond et al., 2017). According to prior research, research-based teacher education programs seem to be more effective than traditional ones (Tatto, 2015). Several factors appear to explain how a research-based approach can improve the quality of teacher education. Research-based teacher education can refer to the qualifications of teacher educators, their participation in research projects, and the goals of teacher education program leaders (Munthe & Rogne, 2015). At the level of teaching practices, research-based teacher education can involve a concentration on both the research content itself and the research problems and processes as well as both teacher- and student-focused practices (Healey, 2005). In building versatile relationships with knowledge, all such teaching practices tend to be valuable. However, student teachers' own research may be the key in supporting them in their relationship to educational knowledge.

According to the literature, research can be used as a conduit to support student teachers' learning to enact enquiry-based approaches into their teaching (Tatto, 2015). This is also one way of supporting student teachers' personal relationships with knowledge. For example, in Finnish primary teacher education programs, student teachers' research projects and the learning of research skills constitute part of their studies (e.g., Heikkilä, 2022). Thus, research skills are of particular interest because they concern how knowledge is produced, maintained, and reproduced in society (Murtonen & Salmento, 2019) and refer to the requisite concepts, tools, and embodied skills to apply these insights (Heikkilä et al., 2020). They help develop epistemic maturity and possibilities to realize that knowledge is always uncertain and created by humans (Murtonen & Salmento, 2019). In teaching, research skills also help in completing the degree as well as in observing pupils and analyzing their thinking (Toom et al., 2010).

Although commonly used as a term in Finnish teacher education (Mikkilä-Erdmann et al., 2019; Niemi & Nevgi, 2014; Stenberg et al., 2016), defining research as a skill in terms of learning to teach does not seem to be established in the international literature. Instead, researchers seem to use corresponding terms such as enquiry orientation (Tatto, 2015) or research-based thinking (Toom et al., 2010). However, the concept of research skills may be useful because it connects research with skills, which are often viewed as practical. For example, discussing theoretical knowledge versus practical skills (Smeby & Heggen, 2014) entails a dissociation of theory from skills and practice from conceptual knowledge. Thus, the concept of research skills is an example of the complexity of epistemic relations because the use of these skills certainly requires theoretical understanding. Moreover, the concept of research skills also points out that the research that student teachers learn in teacher education is not only about knowing but also doing.

In terms of student teachers' research, another concept in both research and policy is research literacy. It is topical in the current knowledge environment where factual arguments are replaced by emotional ones and personal beliefs prevail over expertise and academic values (Hauke, 2019; Hughes, 2019). Notwithstanding, teachers' work increasingly deals with knowledge in the form of teaching information literacy to pupils. Notably, however, the prevailing perspectives range from treating teachers as mere technicians who enact evidence-based scripts to professionals who exercise judgement in deciding what and how to teach (Boyd et al. 2021).

In highlighting the active role of teachers in epistemic relations, Boyd (2021, p. 19) proposed that research literacy should include an understanding of the contested nature of educational knowledge and the interplay between research

and practical wisdom. A step towards defining what research literacy means in the context of the teaching profession has been put forward by Eriksen (2022), who describes research literacy as an intellectual virtue that involves special tasks regarding the application of research to professional practice. Thus, supporting student teachers' research literacy requires making visible their personal relationships with professional knowledge.

To foster these relationships, there is a need for research on student teachers' experiences. Heikkilä et al. (2020) studied Finnish primary teacher students' epistemic agency (Damşa et al., 2010) when they engaged with research skills in a research-based program. The authors collected textual data as part of the student teachers' coursework. The first-year student teachers (N = 73) had just completed their first teaching practicum period at the university's teacher training school where they had put in action the skills learned on campus (e.g., research methods, information seeking, research ethics, data analysis methods, and scientific writing). In their reports, they were instructed to reflect on their experiences of using research skills during the practicum.

The following quotation illustrates a student teacher's insights on the role of research skills in developing one's professional practice and becoming aware of various knowledge-laden activities in teachers' work. In the reflection, the student teacher also brings ethical matters to the relationship by combining these activities with being responsible for pupils:

> In order to be responsible for future generations, we have to know what we do, how we do, when we do, and why we do the way we do. Research is the core of all this. As a teacher, it is extremely important to develop oneself and one's own thinking.

Conversely, the following quotation illustrates how another student teacher felt that the learning of research skills helped them question first-hand impressions about pupils and adopt a critical stance to "existing" knowledge. Here, the relationship with professional knowledge was characterized by an aspiration for depth:

> When conducting research, I realized that a teacher does in his/her work research-like things all the time. You have to interpret and read pupils and also understand where the pupil's actions and reactions derive from.

In the findings of the study, four dimensions of epistemic agency were revealed, with research skills helping student teachers orient themselves toward professional knowledge. First, the dimension of the self concerned the student teachers'

professional development as epistemic agency was directed at these teachers' own teaching. Research skills served as a tool with which to question oneself and one's teaching practices. Second, in terms of the class dimension, epistemic agency was aimed outward, that is, toward what occurs in the classroom and the characteristics of the children. Here, research skills were related to systematic observation and analysis in understanding pupils and their backgrounds.

Third, the research literature dimension concerned critically relating oneself to existing research-based information. Research skills were used to interpret educational knowledge and assess its validity. Fourth, the dimension of everyday life emphasized the student teachers' desire to see the teachers' work in a larger context. Research skills were used to support the teachers when transmitting knowledge to their pupils and show connections between school learning and life outside of school.

The study depicted the way in which the fostering of epistemic agency and, thus, epistemic coherence required attention to student teachers' relationships with knowledge. Although some student teachers mentioned several dimensions, most of them seemed to focus on a single one. The conclusion of this study is that epistemic agency gained through all four dimensions could be made visible for student teachers, implying tremendous potential that has not been attained in teacher education.

In future research, new kinds of relationships with professional knowledge can be found among student teachers. These relationships arise and change constantly as student teachers study on campus and practice teaching in practicums. The relationships are shaped by interaction with teacher educators, peers, and pupils in the practicum. They are also permeated by culture, for example, how professional knowledge in general is discussed on campus and in the practicum. Epistemic coherence can be supported by paying attention to these relationships.

3.5 Conclusion

In this chapter, we have conceptualized epistemic coherence in teacher education as an emergent achievement comprising two key components: a) student teachers creating relations between different knowledge resources or modes of knowledge production and b) student teachers creating personal relationships with professional knowledge. We have argued that this concept can help re-configure the simplified dichotomies that often arise when knowledge is discussed in teacher education and can help analytically unpack the different dynamics at play when student teachers or teacher educators work relationally with knowledge.

More specifically, an analytical focus on the *relations between different knowledge resources* can help differentiate the role that a theory, concept, model, curriculum document, or assessment rubric can play in addressing a specific problem of practice. Rather than talking generically about "theory" or "practice" as homogenous entities, analytical attention to the actual *work* that different knowledge resources do in specific educational settings provides a differentiated view of what it means to "bridge the gap." Through such analyses, one might also find, as Kvernbekk (2012) has argued, that the "gap" is there to do a particular type of job that needs to be identified and exploited.

Second, an analytical focus on the relations between different modes of knowledge production highlights that student teachers (and teacher educators) are not just consumers or "appliers" of knowledge. They also *produce* knowledge as an integral part of tasks related to teaching and learning in teacher education. This happens through experience-based learning in practicum periods, small action research projects, and the application of a range of research skills. Through such processes, different modes of knowledge production contribute to student teachers' qualification processes in a variety of ways. Analytical attention to *what forms of knowledge production* are at play and *the ways in which they interact* enables a perspective that foregrounds how knowledge creation can support student teachers' opportunities for professional development.

Third, an analytical focus on the personal relationships that student teachers form with professional knowledge foregrounds the agency and sense of ownership that they need to develop with the knowledge base of the profession. In professional work, knowledge is not a "technical matter" of the application of rules and procedures. Rather, student teachers need to think analytically and creatively with knowledge as they exercise the autonomy and personal discretion that characterize their future professional practice in schools. Fostering an agentic relationship with knowledge enables student teachers to take control of knowledge resources and the role they should play in professional work.

Our perspective complements previous conceptualizations of coherence (Hammerness, 2006; Hatlevik & Smeby, 2015; Hermansen, 2019; Smeby and Heggen, 2012). Whereas previous perspectives have foregrounded actors' perspective, program characteristics, or teacher educators' visions for teacher education programs, there has been less attention on knowledge resources as an analytical construct in the literature on coherence. However, since knowledge itself is often constructed as the problem (through formulations such as the theory–practice gap or the divide between research and practice), the way in which we reason about knowledge must be an important part of the solution in our pursuit of coherence in teacher education. By approaching the question of coherence through a

relational perspective on knowledge resources, the concept of epistemic coherence provides an analytical entry point. Thereby it becomes possible to imagine how teacher educators, practicum supervisors in schools, and student teachers can work agentially with knowledge resources to create relations between "theory" and "practice" that are meaningful for professional work.

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4 Exploring Finnish Student Teachers' Perceived Coherence of their Teacher Education Program

Mirjamaija Mikkilä-Erdmann, Julia Nummi and Norbert Erdmann

Abstract

Our study investigates how Finnish student teachers experience the coherence of their study program and self-efficacy in teaching. By coherence we mean a continuing process of striving for a consistent teacher education program in which linkages are created between different courses, different stages, as well as theoretical and practical parts of the program. (Canrinus et al., Journal of Curriculum Studies 49:313–333, 2017) In general, the challenge in teacher education is to find the balance between theory and practice during the program. Previous studies have indicated that a lack of coherence may result in fragmented knowledge and skills (e.g., Bain and Moje, Phi Delta Kappan 93:62–65, 2012) and even poor self-efficacy in teaching. The participants of this study are master's level students from two universities located in southern Finland. They are taking part in either a subject or a classroom teacher education program. Finnish teacher education is a five-year master's degree program. The teaching practices are integrated in the initial teacher education program. The instrument used in the study is based on previous studies (Canrinus et al., Journal of Curriculum Studies 49:313–333, 2017; Hammerness et al., Coherence and assignments in teacher education: Teacher education

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survey, University of Oslo Department of Teacher Education and School Research, 2014). In addition, we have included a section about self-efficacy in teaching (Tschannen-Moran and Hoy, Teaching and Teacher Education 17:783–805, 2001). Principle component analysis (N = 127) showed five types of program coherence: opportunity to enact practice, coherence between theory and practice, opportunity to analyze practice, vision of good teaching and self-efficacy. Our results reveal that Finnish student teachers perceive their program as quite coherent and feel prepared for the teacher profession. Minor differences between class and subject teachers were found. Finally, pedagogical conclusions are discussed.

Keywords

Coherence • Student teacher • Teacher education

4.1 Introduction

Teacher education programs strive to develop curricula that support not only high-quality student learning but also the development of competences that are needed in their future teacher profession. Teaching is a complicated, multi-faceted competence requiring high-levels of expertise. Teachers are expected to be well educated "knowledge workers" with profound theoretical domain-specific understanding and general cognitive and social skills. In addition, the so-called situation-specific skills are required in interaction situations within the classroom (Metsäpelto et al., 2022). Skillful teaching becomes visible in the classroom during actual practice. This means that teachers need cognitive, social and situation-specific skills in order to effectively teach versatile students in an authentic classroom setting. The teacher profession is also an ethical profession; teachers evaluate and make important decisions about and for the future of their students. Therefore the question remains, how do study programs support student teachers in acquiring the versatile competencies required in teacher profession and how do the different aspects of teacher education, academia, and schools support the acquisition of high-level teacher competence?

In this study, we focus on Finnish student teachers' perceptions concerning their study program. Since the 70s, research-based teacher education has been the guiding principle in designing teacher education curricula in Finland and has facilitated the professionalism of teachers (Toom et al., 2010). The idea behind Finnish teacher education is that student teachers are already socialized from the beginning of their studies to be active members of academia who study in multidisciplinary universities and do educational research in the form of a thesis and

who are able to make use of research literature when planning or developing their teaching and lessons. Like medical experts, teachers are expected to provide the best "treatment" for their students and are thus expected to explain the rationale behind their actions. (Mikkilä-Erdmann et al., 2019).

Thus, on the one hand, student teachers are subjected to the university as a learning space where they are expected to acquire profound theoretical knowledge concerning, for example, educational sciences and subject studies. On the other hand, student teachers have school practice, where schools serve as a learning space where they ideally learn to teach a diverse set of students with a variety of methods, to understand why something does or does not work, and learn how they can support individual learners. Student teachers learn to evaluate such things as student learning and development of students' learning to learn skills etc. These teaching skills often become visible for students in the school context, which is another important and highly motivating learning space for student teachers and is often considered a very effective one (Grossmann et al., 2008). In addition, student teachers currently learn to work in multidisciplinary groups and collaborate with other professionals like social workers or health care professionals in schools and are therefore also subjected to contexts outside of school which serve as learning spaces. Furthermore, student teachers learn to collaborate with the parents of the students. In sum, student teachers have and need versatile learning opportunities and spaces to learn and practice their academic and professional skills.

The essential questions when designing the teacher education curriculum are how do different learning spaces support individual student learning and how do parts of teacher education come together or complement each other so that student teachers experience such linkages and can actively bridge the gaps between different institutions, courses, and places where teacher education takes place (see Bain & Moje, 2012). The main goal of the teacher education programs is to offer meaningful learning opportunities for student teachers. In the best case, the teacher education program, with its different structures, contents, foci and different spaces, offers students opportunities to learn and develop individual teacher skills that are both theoretically and practically founded and learned.

However, different places of teacher education (i.e. academia, schools, training schools of the university in the Finnish context) are expected to offer different learning experiences while sharing a similar vision regarding what teacher education is striving for. This can be challenging to organize and communicate for both staff and students. Based on previous studies, teaching practice seems to be one critical ingredient in learning to teach (Grossman et al., 2008). An essential

question is how teaching practices are organized and supervised and when student teaching becomes teacher education (Grossman et al., 2008). The teacher profession is a challenging profession because students have 12 years of experience from their own time as a student at school where they were a sort of "apprentice" who observed how professional teachers work but was not be able to observe what a teacher does outside of the classroom during phases of planning lessons and evaluation. As Lortie (1975) points out, the "apprenticeship of observation" can be a problem in teacher education and activate an observe-and-mimic approach in teaching. This problem can limit the goals of teacher learning during teaching practice to rote reproduction of extant classroom practices (Braaten, 2019). Hence, student teachers need theoretical studies, well designed teaching practices and professional mentoring in order to shift the attention away from teaching and towards student learning as well as towards fostering an awareness of problems concerning "mimicking" the teaching practices of former teachers or mentors. Thus, engaging students in early and sustained teaching practices are considered important, but teaching practices have to be designed so that they support the framework of teacher education programs later on (Darling-Hammond et al., 2005). Ideally, a teacher education program is designed so that it supports teacher self-efficacy. By self-efficacy, we refer to students' beliefs (Bandura, 1991) in their competence to teach and support student learning. It can be assumed that coherence in teacher education study programs supports student teachers' self-efficacy (Tschannen-Moran & Hoy, 2001, 2007) As a consequence, students can perceive their practical teaching experiences as being linked to the courses in the university. Therefore, students can apply the learned theoretical concepts to observation allowing them to see classroom practices through the eyes of a professional teacher. The result is that students have meaningful learning experiences and can develop their teacher competences both theoretically and practically (Cavanna et al., 2021).

4.2 Theoretical Foundations

In this study, we focus on how Finnish student teachers perceive the coherence of their study program and feel self-efficacy in teaching. By coherence, we are referring to the continuing process and perceived dynamics of striving for a consistent teacher education program in which linkages are created and made visible for the students between different structures and stages of teacher education, e.g. between courses, theoretical, and practical parts of the program (Canrinus et al.,

2017; Hammerness, 2006). The research on coherence concerning teacher education has produced different kinds of terminology describing the consistency or alignment between the phases or parts of teacher education. In Fig. 1 we visualize structural and conceptual coherence. Structural coherence focuses on the structure, parts and phases of the program, its organization, and how the program's parts are structurally connected, for example, whether courses build sequentially on one another. It pertains to the construction of an integrated experience for student teachers. Structural coherence also covers aligning courses and teaching around a particular vision of learning and teaching (Canrinus et al., 2019).

Conceptual coherence means the connections within the theoretical content of the program, and also refers to the linkage between the structure and content of a program and the alignment of theory and practice. It reflects the deliberate efforts to connect foundational ideas with classroom practice, including shared views and vision of teaching and learning being emphasized across courses. However, conceptual coherence blurs with structural coherence (Canrinus et al., 2017, p. 315; Goh & Yusuf, 2017, p. 44).

In Fig. 2 we illustrate that horizontal coherence refers to connections across courses in different subjects (Buchmann & Floden, 1991, p. 67, org. Tyler 1949) and can be different in primary or secondary school teacher education, which is also referred to as subject teacher education because student teachers"specialize" in study one or two subjects. Subject student teachers study within the subject departments and can build horizontal coherence by concentrating on specific subject studies. In their pedagogical studies subject student teachers are required to build horizontal coherence, for example, between subject studies, educational

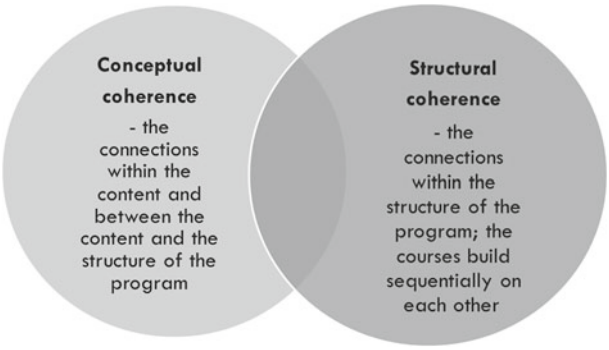

Fig. 1 Conceptual and structural coherence

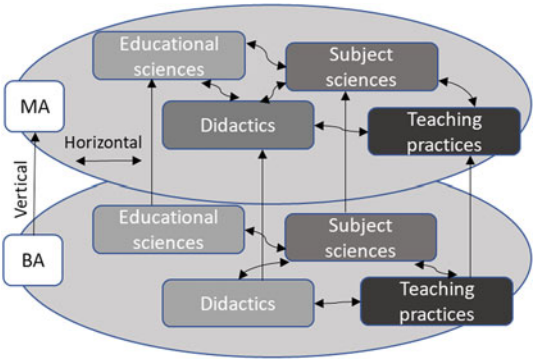

Fig. 2 Horizontal and vertical coherence

sciences and teaching practice in Finland. Primary school student teachers are expected to build horizontal coherence between educational sciences, subject studies and teaching practice during every year of study.

Vertical coherence refers to the curricular links over time (continuity), involving a broadening and deepening of what is studied, rather than a mere repetition of the content (Buchmann & Floden, 1991). Vertical coherence furthermore refers to the set of competencies taught to students in one lesson, course, or grade level that prepares them for the next level of study with higher competencies (Dio, 2020). The continuity of the different teaching practices can also be designed so that the different competences are deepened and the linkages between the bachelor level and the master level educational science are made visible. In the Finnish context, vertical coherence can be considered as a continuum beginning with the entrance examination and spanning until the in-service phase and professional working life.

In general, the challenge in teacher education is finding the balance between theory and practice during a program taking place in different spaces. Coherent educational programs can contribute to improved student outcomes and support students' self-efficacy (Canrinus et al., 2017). Coherent experiences within and across different courses are said to enhance students' motivation to engage in learning tasks, as students build up a sense of mastery over time and over classes (Canrinus et al., 2017). Previous studies have, on the other hand, indicated that a lack of coherence may result in fragmented knowledge and skills (e.g., Bain & Moje, 2012), low self-efficacy and poor learning outcomes (Cavanna et al., 2021). In the worst case scenario, students might quit their study program or leave the profession after graduation at a later point in time. However, previous studies (Canrinus et al., 2017) indicate that students seem to need support in perceiving

coherence, even in a well-designed study program. For example, Canrinus et al. (2017) carried out a comparative survey study about the perceived coherence of teacher education programs from the University of Standford, Oslo, Helsinki, Chile and Verona. In the study, students seemed to perceive a reasonable amount of coherence between courses (M = 3.00, SD = 0.57) and to connect various parts of the program (M = 3.10, SD = 0.65). However, the student teachers experienced less alignment between teaching practices and university courses (M = 2.65, SD = 0.60). Interestingly, Helsinki had the lowest or second lowest means in all three factors. Similar results were found by Canrinus et al. (2019). Thus, in this exploratory study, we are investigating how current student teachers perceive their study program and how class student teachers differ from subject student teachers in their perceptions concerning coherence and self-efficacy.

4.3 Context of the Study: Finnish Teacher Education

In Finnish comprehensive school primary school teachers, called class teachers, are mainly teaching children grades 1–6 (ages 7–13). Subject teachers typically work with youth, ages 13–15, in comprehensive schools or in secondary schools with students, ages 16–19. In this study, we used participants from both class and subject teacher education, who, at the time of the study, are currently studying in their five-year master's degree programs.

A class teacher works in primary education and is responsible for one specific grade, but teaches several subjects. In class teacher education, the principle subject is educational science. Multidisciplinary studies further enable a broad knowledge in different subjects taught in comprehensive schools. Class teacher education takes place entirely in the faculty of teacher education. The teaching practices are integrated within the programs and they are mostly implemented in the teacher training school owned by the university. In order to get into the program, applicants must pass a two-phase entrance examination consisting of a cognitive part (matriculation examination score or multiple-choice test score) and an aptitude test (multiple mini-interviews). In Finland, there are still many candidates applying for study spots in the class teacher education. The acceptance rate of the candidates is very low, only around 12% are accepted.

In the subject teacher education, most of a student's studies take place in the subject departments. A subject teacher specializes in teaching a particular subject or subjects (e.g., foreign language teacher, mathematics teacher, etc.). Subject student teachers complete a bachelor's thesis in educational sciences and a master's thesis in their specific subject faculties. After finishing the bachelor's

degree, students can apply for the teacher's pedagogical studies in the department for teacher education. The pedagogical studies phase takes one year and includes educational sciences, subject didactics and teaching practices, which mostly take place in the teacher training school. Hence, both student teacher programs, classroom teacher and subject teacher education, are masters' level academic, five-year study programs consisting of theoretical and practical studies and teaching practices. Both classroom teachers and subject teachers take courses in research studies and must write a bachelor's and master's thesis. This provides them with a general academic qualification, making it possible for them to apply for doctoral studies. In addition to that, Finnish teachers are qualified after they have completed their 5-year study program (master's thesis and credits). After graduation Finnish teachers have a greater autonomy compared to other countries because there are no inspectors or standardized tests used in the Finnish schools. Teachers are responsible for themselves for creating coherence from pre-service to the in-service training.

Class teachers have educational sciences as majors, write BA and MA theses, and study subject didactic studies of subjects taught in the Finnish comprehensive school (e.g. mother tongue (language arts), math, physical education, art) in the Department for teacher education. They do their teaching practices in the training school of the university which are integrated to the five year study program.

A challenge of subject teacher education is that students mostly study in the faculty of their subject the first 3–4 years. This means, for example, that student teachers studying foreign languages, history, or science remain in a disciplinary coherent world (e.g. humanities) and only upon admittance into pedagogical studies for the subject teacher profession do they enter in a new faculty and begin studying a new discipline. In this way, students may perceive incoherence both horizontally and vertically.

It is important to investigate student perceptions concerning coherence in order to develop the quality of teacher education. Previous studies indicate that students have some problems perceiving coherence (e.g., Canrinus et al., 2017) despite Finnish teacher education programs undergoing regular reform in two to three year cycles and having a curricula which is collectively developed on an institutional level. Therefore, our study has the following goals: first, we are interested in how our student teachers perceive coherence in their study program. Second, we investigate how students experience teaching self-efficacy. Finally, we examine how classroom teachers differ from subject teachers concerning their perceptions of coherence and teaching efficacy.

4.4 Method

We started to compile the questionnaire with the help of former survey studies regarding program coherence in teacher education (Canrinus et al., 2017, 2019; Cavanna et al., 2021; Goh & Yusuf, 2017; Goh et al., 2020; Grossman et al., 2008; Hammerness et al. 2014; Hermansen, 2020). In addition, we included a section about self-efficacy (Tsachannen-Moran & Hoy, 2001). At first, we worked with the original sections and items written in English and negotiated with other ConnEcTEd partners about the dimensions of coherence and the suitable wording. We clarified the terms and phrases with the help of a glossary we created together. In addition, we modified all the items to fit into a Likert scale 1–5 (1 = strongly disagree and 5 = strongly agree) to keep the questionnaire as clear as possible. We translated the questionnaire into the Finnish language since we found it important to approach the participants with a language and context they know from their daily life as student teachers. Two researchers translated the items parallelly. Several teacher educators were consulted when deciding on the final versions of the translations. We also added an optional open answer field after every section. Such qualitative data will be used to enrich and provide a complimentary perspective to the quantitative data.

The pilot study was conducted in the fall semester of 2021. There were 35 participants of which 16 were Finnish student teachers. In addition, we interviewed three of the participants. The goal was to get feedback for the development of the survey measurement and gain insight into the current teacher education program itself. The pilot study indicated that the questionnaire can be adapted into Finnish context, but simultaneously, it revealed the need for some clarification. Consequently, we decided to remove a few unclear items and further develop the wording. We also added short descriptions before every section and definitions for commonly used terms that were confusing or could be understood differently (teacher educator, teaching practice, university course) at the very beginning of the questionnaire form.

The final version of the teacher education program coherence survey was conducted in the spring semester of 2022. It consists of 54 items and seven sections. The first section contains background variables, Sects. 2–6 are focused on different dimensions of coherence, and the seventh section on self-efficacy. The fourth section is only for subject student teachers. We collected the data in RedCap (Research Electronic Data Capture) and sent the survey link to potential participants via university mailing lists as well as directly to a couple of teacher educators, who shared it to their students during their lecture. A total of 156 students opened the survey link, however, 29 forms were removed as they were

completely empty or only contained a partially completed first section. In the final survey data, there are 127 participants, who are master's level students from two universities from southern Finland studying either a subject (N = 86) or a class (N = 39) teacher education program. Most of the subject teachers from the date major in human sciences, such as Finnish language, foreign languages, and history, but there are also some students with natural science majors.

4.4.1 Analysis

We started with principal component analysis (PCA), which is a method for reducing and outlining quantitative data. We used IBM SPSS Statistics 26 for the analysis. Before running PCA, we cut out the first and fourth section, in total 14 items. This was done because the first section focusing on background variables was not applicable for PCA. Concurrently, the fourth section was eliminated since it concerns only subject student teachers. PCA is a statistical approach that would suffer from the missing data. We chose varimax rotation to facilitate the interpretation of the dimensions and the missing values were replaced with means of the items. With the first run, PCA was based on 36 components. Next, we applied 3–7-factor solutions and tried out different combinations with the items. In total, three items were removed in the analysis process. A further three items were removed because their correlations were low compared to other items and they were not fitting to the components. Finally, PCA was performed on 37 items (see Table 1).

Principal component analysis (N = 127) revealed a five-component model, which explained 55% of total variance. All items showed component loadings > 0.39 and all five components had good internal consistency, with Cronbach's alphas > 0.81. Components showed weak and moderate correlations, ranging from r = 0.19 (between components 3 and 5) to r = 0.59 (between components 2 and 4). The five-component model is comparable with the former models of Canrinus et al. (2017) and Goh and Yusuf (2017), since components 1, 2, 4 and 5 consist of very similar items. Furthermore, the scree plot was examined. The cut-off point with five components was relatively clear because the line stopped descending precipitously and leveled out.

Component: "Opportunity to enact practice" had a high eigenvalue of 10.17 and it explained 13.5% of total variance. Component 2: "Coherence between theory and practice" had an eigenvalue of 3.56 and it explained 13.4% of total variance. Component 3: "Self-efficacy" had an eigenvalue of 2.37 and it accounted for 11.8% of the variance. Component 4: "Opportunity to analyze

Table 1 Principal component analysis with factor loadings and Cronbach Alphas

Items	Factor loadings
Component 1: Opportunity to enact practice (α = ,850)	
During my teacher education program, I have had the opportunity to…	,831
13. do exercises (e.g., writing, reading, math or grammar tasks) that the pupils are doing in class	,823
14. examine samples of pupils' work	,781
12. practice or implement something I planned to do in my class	,709
20. practice assessment (e.g., prepare tests, assess peers, give grades)	,635
11. plan teaching (e.g., prepare unit plans, lesson plans, or prepare teaching materials)	,578
15. examine actual teaching materials (e.g., textbooks, exercises, unit/lesson plans made or used by actual teachers)	,525
17. examine national, state, or local curriculums, standards, or guidelines	,510
19. discuss experiences regarding my pupils' learning in my university classes	
Component 2: Coherence of theory and practice (α = ,882)	
26. In my teaching practice(s), I have observed teachers or other teacher students using similar teaching methods or theories to what I have learned in my university courses	,776
25. What I have learned during my teaching practice(s) fits in terms of the content to what I have learned in my university courses	,718
21. I have been able to make connections between the educational theories I've learned and the teaching practice(s) I've been engaged in	,711
22. I have been given assignments that have connected my teaching practice(s) with the university courses	,705
24. My teaching practice(s) have allowed me to try out teaching methods or implement theories I have learned in my university courses	,693
40. I have learned about the vision of "good" teaching that my teacher education program promotes	,560
54. I find my university studies meaningful regarding my future job as a teacher	,531
23. The teacher educators have been demonstrating effective teaching methods	,499
Component 3: Self-efficacy (α = ,833)	

(continued)

Table 1 (continued)

Items	Factor loadings
47. I can get the pupils to follow classroom rules	,726
51. I have good teaching skills	,723
52. I am good with children	,710
49. I can establish routines to keep activities running smoothly	,701
48. I can get the pupils to believe they can do well in schoolwork	,652
53. I feel well prepared for professional life	,631
45. I can respond to questions from pupils	,585
46. I can adjust my lessons to the proper level for individual pupils	,536
50. I can implement various kinds of assessment methods	,392
Component 4: Opportunity to analyze practice (α = ,816)	
30. During my teacher education program, I have had the opportunity to read, analyze, or discuss general research methods that are relevant to teacher's profession (e.g., how to conduct educational research, qualitative or quantitative research)	,707 ,690 ,680 ,554
31. During my teacher education program, I have had the opportunity to read, analyze, or discuss research methods I could use in investigating pupils' learning or questions in my own classroom (how to do 'action research' or 'inquiry' in my classroom)	,529 ,477 ,474 ,400
28. During my teacher education program, I have had the opportunity to read, analyze, or discuss 'broad' educational theory (foundational theory about teaching and learning, adolescent development, e.g., Vygotsky, Piaget, Bruner)	
35. I have been able to reflect upon the ways my conceptual understanding of teaching and learning has been developing	
29. During my teacher education program, I have had the opportunity to read, analyze, or discuss educational theories that are relevant to my subject matter (e.g., research on teaching math, languages, arts, history, social sciences)	
33. Regarding theoretical contents, later courses have built on previous ones in the teacher education program	
32. I have been able to connect theories/concepts from one class to another within the same course	
27. During my teacher education program, I have had the opportunity to read, analyze, or discuss subject matter theories relevant to teacher's profession (e.g., theories in literacy, languages, natural sciences or social sciences, mathematical ideas, historical analyses)	

(continued)

Table 1 (continued)

Items	Factor loadings
Component 5: Vision of good teaching (α = ,848)	
44. The teacher educators seem to know what the program includes in its entirety	,877
43. The teacher educators seem to know what I am required to do in my teaching practice(s)	,820
42. The teacher educators seem to know what is happening in other courses of the program (e.g., assignments, readings, key ideas)	,749

practice" had an eigenvalue of 1.89 and it explained 8.9% of total variance. Finally, Component 5: "Vision of good teaching" had an eigenvalue of 1.70 and it accounted for 7.2% of the variance.

For the comparison of class and subject teacher students, we carried out a nonparametric Mann–Whitney test. We had to use a nonparametric version, since our comparison groups (N < 39, N < 86) did not fulfill the requirements of normal distribution.

4.4.2 Open Answers

We also carried out an explorative qualitative content analysis on the open answers, which were included on the survey and placed after each section. Above these open boxes stood: "Is there something you want to add to this topic?". 50 out of 126 participants wrote down at least one comment on these open boxes. We collected the answers into one document, number coded the participants and categorized the answers based on the sections of the survey. The open answers provided a total of 14.5 pages of data, from which we searched for repetitive comments in the data. We color coded some themes and made a table for clarification. The qualitative data both support and give another perspective on the results of the quantitative data.

4.5 Results

Our study reveals that the Finnish student teachers perceive their program as rather coherent. The component "Opportunity to enact practice" ($M = 4.37$; $SD = 0.66$) had the highest mean. According to our survey, the student teachers reported that they had a good number of opportunities to practice skills, which are relevant for a teacher's profession. (e.g., During my teacher education program, I have had the opportunity to plan teaching). Additionally, according to the nonparametric Mann–Whitney test, there was a statistically significant difference between class and subject teacher students ($U = 1022.500$, $p = 0.001$) in this component. Subject teacher students ($N = 85$, $MR = 68.97$) reported having had more opportunities to enact practice than class teacher students ($N = 38$, $MR = 46.41$).

Further, the means of component two "Coherence of theory and practice" ($M = 3.77$; $SD = 0.79$) and four "Opportunity to analyze practice" ($M = 3.67$; $SD = 0.71$) were rather high. The items of component two are related to linkages between theoretical courses and teaching practices in the program (e.g., My teaching practice(s) have allowed me to try out teaching methods or implement theories I have learned in my university courses). In other words, coherence between theory and practice seems to actualize rather well in the programs. However, in the open answers, a couple of participants related that their experience of the program was overly theoretic and "too far from the daily life as a teacher". The student teachers stated that they would have wished for more practical aspects. When running a Mann–Whitney test, we could not find a statistically significant difference ($U = 1265.50$; $p = 0.397$) between class ($N = 36$, $MR = 53.65$) and subject teacher students ($N = 78$, $MR = 59.28$) in component two.

The items of component four refer to theoretical and methodological skills that are taught in the program (e.g., During my teacher education program, I have had the opportunity to read, analyze, or discuss general research methods that are relevant to teacher's profession). However, as said before, some student teachers perceived an imbalance between theory and practice in their teacher education program. In the open answers, a couple of student teachers described a lot of repetition of certain terms and concepts in their program, but a lack of development and depth of those same terms and concepts. Also, according to the nonparametric Mann–Whitney test, there was a statistically significant difference between class and subject teacher students ($U = 1133.00$; $p = 0.027$). Class teacher students ($N = 37$; $MR = 70.38$) experienced having more opportunities to analyze practice than subject teacher students ($N = 82$; $MR = 55.32$).

Component five "Vision of good teaching" had the lowest mean (M = 3.23; SD = 1.06). The items refer to the communication of teacher educators (e.g., The teacher educators seem to know what the program includes in its entirety). Based on the open answer fields, student teachers perceived that there were information gaps and a lack of communication especially between the teacher educators of university and the teacher training school, who are physically far from each other. However, Mann–Whitney test did not show a statistically significant difference in this component (U = 1431.00; p = 0.856), when comparing class (N = 35; MR = 57.68) and subject teacher students (N = 79; MR = 58.89).

Our additional component, three, "Self-efficacy" (M = 4.12; SD = 0, 53), had the second highest mean. Component three includes items concerning self-evaluation of teaching skills (e.g., I can adjust my lessons to the proper level for individual pupils). In other words, the student teachers seemed prepared to work in the teacher profession. We could not find a statistically significant difference in this component (U = 1255.50; p = 0.187) when comparing class (N = 37, MR = 52.93) and subject teacher students (N = 80, MR = 61.81).

4.6 Discussion

The goal of this study was to investigate, how Finnish student teachers perceive their study program and self-efficacy in teaching. Our study supports the applicability of the instruments used in previous studies (Canrinus et al., 2017, 2019; Goh & Yusuf, 2017; Grossman et al., 2008; Hermansen, 2020; Tsachannen-Moran & Hoy, 2001) when exploring student teachers' perception of coherence and self-efficacy. However, we have to keep in mind that the data was gathered from a relatively small sample size with convenience sampling. This can be seen as a limitation when generalizing the results. Nevertheless, the results indicate that students perceive the teacher education curriculum as rather coherent, both conceptually and structurally. Even the theory–practice-gap can be considered to be bridged as students reported having had possibilities to apply theoretical knowledge and models in teaching practice in schools. Furthermore, students perceived high self-efficacy and felt well prepared to work in the teacher profession. The results also indicate minor perceived problems concerning perceived coherence in component 5 "Vision of good teaching". Our interpretation goes in two directions. First, there are different kinds of notions of "good teaching" in the academia among teacher educators as well as among mentors in the training school, but there seems to exist information gaps and even a lack of communication between the teacher educators in academia and the mentors in the teacher

training schools. This could be due to cultural and physical factors, i.e. training schools are often located physically far from the university. Hence, the perceived incoherence seems to be located in both structural and conceptual coherence. The results are in line with previous research (Canrinus et al., 2017; Cavanna et al., 2021) showing that when creating coherence, one essential issue which must be present is the communication between different actors in different places of teacher education. This communication should support the students in their understanding of the vision of teacher education and the multiple perspectives concerning what good teaching entails as is laid out by different actors. Students should be regarded as active agents in constructing coherence and looking for rationale behind different visions of good teaching. In addition, academic leadership has an important role in supporting institutional coherence and dialog about the vision behind teacher education (Cavanna et al., 2021).

It is characteristic for the Finnish teacher education model that written curricula are reformed every 2–3 years and involves intensive collaboration among teacher educators working in different places or positions at the university and in the training schools. Feedback from students is regularly collected; members of student unions are represented in the curriculum planning groups which reform teacher education curricula. We assume that the perceived incoherence is, to some extent, caused by the logistic problems mentioned above or problems concerning the conceptual coherence, i.e. contents dealt with in specific courses. For example, a typical case seems to be that students are confronted with theoretical approaches or concepts which are repeated on a superficial level but not expanded upon from year to year, causing vertical coherence problems. Hence, theoretical background is perhaps poorly linked to how students can apply the concept in the classroom situation when they are teaching. The reason may be that teacher educators may not know what colleagues are teaching and how they are teaching. Thus, our teacher education curricula seem to be well reformed on a structural level but poorly on a conceptual and pedagogical level.

Furthermore, we assume that the research skills and critical stance that are in the middle of the Finnish research-based teacher education may support students in building coherence between different aspects of teacher education. Student teachers receive support in analyzing problems and constructing solutions (Aspfors & Eklund, 2017). Teaching practices are planned as a continuum and the training schools of the universities offer different facilities and resources than in other countries. However, effective communication and meta-teaching is suggested by the teacher educators in order to make the linkages and logic between different phases and aspects of the teacher education visible. Thus, we have to support students in their perception of coherence so that they are navigating in

a singular realm of theory and practice, as opposed to two separate realms (see Bain & Moje, 2012).

Our results further indicate that there are minor differences in the perceptions of coherence between class teachers and subject teachers. Subject student teachers perceived having had more opportunities to enact practice than the class student teachers. But surprisingly, the class student teachers reported having had more opportunities to analyze practice than subject teachers. This result should be further investigated. Another important topic for future research is how the academic teacher education creates coherence between pre-service and in-service teacher education in Finland. Longitudinal studies are needed concerning the development of teacher competences during the pre-service teacher education and in-service phase. In addition to questionnaire studies using self-reported data, process methodology is needed in order to capture student teachers' learning processes concerning building coherence and developing teacher expertise. Finally, Finnish teacher education is structured very much like school in the bachelor phase. Perhaps our student teachers should be given more room and time for creating coherence by themselves (see Buchmann & Floden, 1991).

Teachers are very important members of society; they teach essential skills for future citizens and socialize students of different ages in democratic societies. Therefore, the experiences of student teachers concerning teacher education is an important and relevant research topic in times of changing societies and huge global challenges which require global solutions, i.e. climate change or loss of biodiversity. Academic teacher education has an important role in supporting both class and subject teachers in developing coherence of their to be acquired competences in both pre- and in- service phases.

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Coherence in Initial Class Teacher Education in Croatia – Student Teachers' Perspective

5

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Abstract

Since 2005/2006, class teachers in Croatia have been educated in five-year integrated university study programmes (300 ECTS, MA level). The rationale behind this was the growing complexity of the class teacher's role. A more coherent curriculum was aimed for in order to avoid fragmentation between subject-matter content knowledge, pedagogical-content knowledge, and general pedagogical knowledge. Considering that the perspectives of students and of experts developing the programme can differ significantly, this paper analyses the student teacher perspective on the coherence of different parts of the study programme. The participants (N = 75) were students in their final semester of the programme for class teachers at the University of Zagreb. The questionnaire used in the research was previously developed within the Erasmus+ project ConnecTEd. From the observed components of coherence, students perceived the connections between content taught within particular courses as highest, and teacher educators' knowledge of the programme contents in its entirety as lowest. Further, students did not recognise

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university-based courses and school-based teaching practice as being sufficiently coherent. The results indicate the need for improvement of the existing programme, starting with the inclusion of all stakeholders in the development of a common vision on learning, teaching, and aims of teacher education.

Keywords

Class teacher • Initial education • Coherence • Student teachers

5.1 Introduction

Over the last two decades, initial education of teachers in Europe underwent significant transformations. These transformations were fostered by the initiatives and recommendations advocated at the European policy level and are most frequently described as *Europeanisation, universitation, harmonisation, and internalisation of teacher education* (Domović & Peček Čuk, 2014, Symeonidis, 2018, 2021; Zgaga, 2013, 2021). Their implementation aims to improve the quality of teacher education which has been recognised as the major intraschool determinant of the quality of student achievement (Barber & Mourshed, 2007; Fleisch et al., 2011; Hattie, 2003; Mourshed et al., 2010).

The changes in initial teacher education in numerous European countries were undoubtedly most significantly influenced by the Bologna process, i.e. the development of the European Higher Education Area (Iucu & Iftimescu, 2021), along with the European recommendations which emphasized the importance of education of all categories of teachers in higher education institutions and the opportunity to continue their studies at postgraduate level (e.g. European Commission, 2005).

The accession of Croatia to the Bologna process in 2001 initiated a reform of the higher education system which also instigated radical changes in teacher education. The Bologna process was recognized as an opportunity for introducing structural changes, innovation of content, and teaching and assessment approaches in teacher education. The greatest structural change, which came as a result of the higher education reform, can be described as *universitation* of the initial education of class teachers. Prior to the reform, the education of class teachers, i.e. teachers teaching in the first four grades of compulsory education (ISCED level 1), was conducted by teacher colleges which organised professional study programmes. At the same time, subject teachers, who teach at upper-primary level and in secondary schools (ISCED level 2 and 3), were educated at universities. At the beginning of the academic year 2005/6, new programmes for the education of class teachers were introduced. Since then, dualism in the education

of class teachers and subject teachers, which implied differences in the status of institutions providing their education (higher vocational colleges versus university institutions), or professional versus university programs, has been overcome.

Although today both class teachers and subject teachers acquire the same level of university education (ISCED level 7), their models of study are different. The study programme for the education of subject teachers is mostly organized according to the consecutive model in two cycles—BA level (180 ECTS credits) and MA level (120 ECTS credits) at the faculties for specific academic disciplines. Study programmes for prospective class teachers are organized according to the integrated model of the undergraduate and graduate level (5 years, 10 semesters, 300 ECTS) and are delivered at faculties of teacher education.

The key reason for introducing the integrated study model in class teacher education was the complex demand on the role of the teacher in the first four grades of schooling, where one teacher teaches six subjects throughout the four years for the same cohort of pupils. Experts involved in developing the new programme of study for class teachers worked toward the incorporation of all categories of teacher knowledge. Schulman (1986) defined seven categories of teacher knowledge: 1) content knowledge, 2) general pedagogical knowledge, 3) curriculum knowledge, 4) pedagogical content knowledge, 5) knowledge of learners and their characteristics, 6) knowledge of educational contexts, and 7) knowledge of educational aims, purposes, and values. In Croatian programmes of teacher education, the mentioned categories are compressed into three basic categories: content knowledge (CK), pedagogical-content knowledge (PCK) and general pedagogical knowledge (GPK). In other words, the programme attempted to include interconnected areas of teacher knowledge which are described as: a) knowledge of learners; b) understanding of curriculum content and goals, including the subject matter and skills to be taught in light of disciplinary demands, student needs; and c) understanding of and skills for teaching, including content pedagogical knowledge and knowledge for teaching diverse learners, as these are informed by an understanding of assessment and of how to construct and manage a productive classroom (Darling-Hammond, 2006; Darling-Hammond & Bransford, 2005). Programmes of study for class teacher education in Croatia, with minor deviations between programmes of study at different universities where class teachers can study, dedicate approximately 40% of study time to subject-matter content knowledge (CK), 15% to general pedagogical knowledge (GPK), 35% to pedagogical-content knowledge (PCK), and 10% to school-based practice (Domović et al., 2017; Vizek Vidović & Domović, 2019).

Along with structural changes, the development and implementation of university programmes for the education of class teachers also included adopting

a new educational culture which demanded developing new professional beliefs and behaviours by university staff. This primarily referred to the transition from the traditional content and teacher-oriented culture to the student-centered educational culture (Domović & Vizek Vidović, 2015, Peček Čuk & Domović, 2021). Furthermore, an important intention in developing the programme was to ensure coherence and enrichment between particular parts of the curriculum and to align aims, learning experiences for students, and assessment approaches throughout the entire period of study. In other words, the programme was conceptualized to ensure constructive alignment, this implies that teaching was designed to engage students in learning activities which would optimize their chances for attaining the specified learning outcomes (Biggs, 2001, 2014).

Although there was no national standard for teacher competences in Croatia at the time when the programme was being developed, experts for teacher education reached agreement regarding common aims and attempted to ensure structural coherence within the programme. This was done with the aim of enabling students to experience an integrated approach, i.e. become aware that "different courses build upon and support each another, as well as aligning courses and field placements around a particular conception of teaching and learning" (Lindvall & Ryve, 2019, p. 142).

However, different levels of the curriculum, particularly the official, taught, and assessed curriculum, are not always in alignment with the learned curriculum (Glatthorn, 2000). That means that although experts in teacher education may believe that they have designed a coherent programme of study that enables students to implement, connect, and transfer knowledge, skills, and values between different parts of the programme, at the same time, the students' perspective may be significantly different. Therefore, this paper deals with the analysis of the student teacher perspective on the coherence of different parts of the programme for class teacher education.

5.2 Coherence in Teacher Education

Although coherence is considered an important determinant of quality teacher education programmes that contributes to avoiding fragmented and mutually unrelated learning experiences for student teachers (Canrinus et al., 2019), the term coherence in teacher education programmes is not explicitly defined (Grossman et al., 2008, Lindvall & Ryve, 2019). In defining coherence, structural and conceptual coherence are often differentiated (Hammerness, 2006), although this

distinction is not always without overlap. Structural coherence includes organization and alignment of courses, i.e. creating courses which build on each other and mutually reinforce each other (Hammerness, 2006; Lindvall & Ryve, 2019). Conceptual coherence refers to content coherence aiming to ensure meaningful relationships between key ideas in the programme (Canrinus et al., 2019), i.e., it implies that a common understanding of teaching and learning is emphasized in all courses (Cavanna et al., 2021). Furthermore, it is emphasized that when developing a programme, it is important to take into account contextual coherence, understood as "alignment of courses to practical or clinical experiences (Goh & Canrinus, 2019, p. 30), i.e., as alignment with external requirements (Canrinus et al., 2017).

Achieving coherence in programmes of teacher education involves various stakeholders (academic staff, student teachers, mentors in schools, educational policy makers) who negotiate the modification of the various programme elements based on a commitment to the common vision of what comprises good teaching, of common beliefs on learning and teaching, and of those who have the same understanding of the standard that should be achieved in practice (Goh & Canrinus, 2019; Richmond et al., 2019). That is to say, programme coherence includes the scope within which institutions for teacher education use an agreed upon framework for curriculum development with clearly defined aims which enable prospective teachers to critically question the purpose of teaching. It also enables them to see the connection between theory and practice through questioning the interconnectedness of various elements of the programme (Goh et al., 2020). Accordingly, Canrinus et al., (2017, p. 313) emphasize that "strong teacher education programmes" consist of programmes in which all courses are "aligned based on a vision of good teaching" (315), i.e. courses which establish coherence between theoretical and practice-oriented courses alongside the courses which are carried out at institutions for teacher education and the school-based practice. Programmes of study which are coherent enable students not only to notice connections between particular parts of the programme, but also to integrate and transfer knowledge of one area to another during their studies (Goh et al., 2020).

Numerous studies point to the significance of coherence in initial education for the professional development of teachers. Coherent programmes of study positively affect the perception of self-efficacy among future teachers (Goh & Canrinus, 2019), increase their self-confidence, and train them for challenges they will encounter in their profession (Goh & Blake, 2015). Research focusing on the issue of coherence in programmes of study from the students' perspective show that students, in programmes which have, over the years, continually tried to establish and ensure coherence, perceive coherence in initial education more

strongly than students whose programmes of study are undergoing changes and improvements which are not directed toward creating coherence (Canrinus et al., 2017). This finding is in agreement with defining coherence as a process (Canrinus et al., 2017; Richmond et al., 2019) which stresses that many individuals with different visions should create a whole that is coherent (Floden et al., 2021).This means that in order to ensure programme coherence, a common vision on what a good teacher entails is necessary alongside the understanding that work on developing coherence in a programme of study is a long-term and continuous process which demands support from the institution in which the programme of study is being carried out (Goh et al., 2020).

The quality of study programmes for teacher education in Croatia has been researched by examining students' self-assessments on the acquisition of competences during their studies (Domović et al., 2022), through comparative analysis of programmes of study at various institutions for teacher education (Knežević, 2017), and by researching the development of students' professional identity during their studies (Vizek Vidović & Domović, 2019). To date, coherence in study programmes from the perspective of students has not been the subject of national research.

5.3 Research Context

Research presented in this paper is part of a large-scale research conducted within the Erasmus+ KA2 project "Coherence in European Teacher Education: Creating transnational communities of practice through virtual scenarios" (2020—1—DE01-KA203-005728). The research was carried out at partner institutions for teacher education in Germany, Sweden, Finland, Norway, France, and Croatia. The results shown in this paper refer only to data collected among students of the Faculty of Teacher Education, University of Zagreb, which is the largest institution for the education of class teachers in Croatia. The study for prospective class teachers is organized as an integrated undergraduate and graduate study (300 ECTS points). Upon completion of the programme of study, students acquire the academic title master of primary education, which qualifies them for work in lower primary education, i.e. with students between the ages of 6 and 10. The programme of study covers four basic components—subject-matter content knowledge (CK), pedagogical content knowledge (PCK), general pedagogical knowledge (GPK) and school-based practice. The programme of study is structured in a way that in the first three years of study focus is on subject knowledge

(CK) and educational sciences (GPK), while the last two years are mainly devoted to subject teaching methodologies (PCK) and school-based practice.

5.4 Research Question

This research represents the first research of students' perception of coherence in the programme of study for class teacher education in Croatia. Therefore, its focus is directed toward one research question:

To what extent do teacher education students find their programme of study coherent?

5.5 Method

5.5.1 Participants

The sample of participants comprised 75 students in their final (10th) semester of the programme of study for class teachers in the academic year 2021/22 at the Faculty of Teacher Education, University of Zagreb. They represent 60.5% of the total number of students enrolled in the same programme and at the same institution. As the research aim was to estimate coherence in the entire programme of study, students attending their final year of study were selected. The majority of the participants were women, and the largest number of participants were between 22 and 23 years of age (86.7%). Prior to enrolling in their studies, most of the students completed a general upper secondary education -*gymnasium*- (85.3%), while other participants completed upper secondary vocational schools. Only four participants had the opportunity to do part-time work in schools during their studies and as unqualified teachers which means that the student teachers included in the research are unexperienced teachers.

5.5.2 Instrument and Data Collection

The questionnaire on the perception of coherence in teacher education programmes of study was used within the project *Coherence in European Teacher Education: Creating transnational communities of practice through virtual scenarios.* The development of the questionnaire was based on earlier research on the

coherence of the study programme (Canrinus et al., 2017, 2019; Goh & Canrinus, 2019; Goh & Yusuf, 2017; Grossman et al., 2008; Hermansen, 2020). To test instrument validity, pilot research was carried out on a smaller sample of participants at all partner universities. Based on the pilot results, parts of the questionnaire were revised and corrected. The final version was translated from the English language to the Croatian language and adapted to the Croatian context of class teacher education. The questionnaire comprised 45 items in total (Cronbach alpha 0.913) and contained seven subscales. For the purpose of this paper, four subscales were used: 1) perceived links over time in teacher education programme (4 items), 2) perceived links between university courses and teaching practices (7 items), 3) perceived opportunity to learn about key theories and research methods (5 items), and 4) students' perspective of teacher educators' knowledge of the teacher education programme (5 items). The participants expressed their agreement with the statements on a five-grade intensity scale (from 1—strongly disagree, to 5—strongly agree). Satisfactory internal consistency was established (Cronbach alpha was within the range from 0.717 to 0.823) for all the scales used. The overall perception of coherence of CK, PCK and GPK in the entire programme of study was estimated with one additional statement.

The questionnaires were administered by researchers during regular classes after obtaining informed consent from the students. Participation in the research was voluntary.

5.6 Results

The data collected was analysed using the SPSS statistical programme (version 2.0). In addition to the overall mean values for the scales, Table 1 shows the distribution of results (N, %) and mean values (M) with associated standard deviations (SD).

When the total mean values of the scales that test particular elements of programme coherence are compared, as can be seen in Table 1, students perceive as best coherence of content which is being learned during their studies (M = 3.67). Their estimate of the ability to observe coherence between university-based courses and school-based teaching practice is somewhat lower (M = 3.41). Opportunities for learning about key theories and research methods are assessed as somewhat lower than the first two components (M = 3.16), while university teacher educators' knowledge of the content of the programme of study is perceived as the weakest component of coherence in the programme of study (M = 3.02).

Table 1 Estimate of perceived coherence of programme of study according to each of the subscales (%, M, SD)

Perceived links over time in teacher education program ($\alpha = 0.717$)						
	N	Strongly disagree + rather disagree N (%)	Neither agree nor disagree N (%)	Rather agree + strongly agree N (%)	M	SD
I can connect ideas, content, notions, and concepts that appear within the framework of one course	75	6 (8.0)	15 (20.0)	54 (72.0)	3.72	0.78085
Theoretical contents within the programme build on one another during the course of study (e.g. contents in courses build on the courses from the previous year/ semester)	75	9 (12.0)	23 (30.7)	43 (57.3)	3.57	0.94688
Courses within the study programme have been built on the theoretical models of teacher competencies	75	10 (13.3)	30 (40.0)	35 (46.7)	3.33	0.85950
I have been able to reflect on the ways my understanding of learning and teaching has been developing during my course of study	75	4 (5.3)	6 (8.0)	65 (86.7)	4.05	0.78660
Total					**3.67**	**0.62217**
Perceived links between university courses and teaching practices ($\alpha = 0.812$)						

(continued)

Table 1 (continued)

Perceived links over time in teacher education program ($\alpha = 0.717$)						
	N	Strongly disagree + rather disagree N (%)	Neither agree nor disagree N (%)	Rather agree + strongly agree N (%)	M	SD
I can make connections between theoretical knowledge on education, learning, and teaching with real teaching practice I have participated in	75	6 (8.0)	22 (29.3)	47 (62.7)	3.65	0.83007
I have been given assignments which have connected my school-based practice courses with theoretical university-based courses	75	14 (18.7)	27 (36.0)	34 (45.3)	3.27	0.90544
Mentor teachers in schools have been demonstrating effective teaching methods	75	13 (17.3)	29 (38.7)	33 (44.0)	3.36	1.00861
Teacher educators at my university have been using effective teaching methods	74	16 (21.6)	29 (39.2)	29 (39.2)	3.16	0.79428

(continued)

Table 1 (continued)

Perceived links over time in teacher education program ($\alpha = 0.717$)						
	N	Strongly disagree + rather disagree N (%)	Neither agree nor disagree N (%)	Rather agree + strongly agree N (%)	M	SD
My school-based teaching practice(s) allowed me to try out teaching methods and implement theories I have been learning about at the faculty	75	5 (6.7)	22 (29.3)	48 (64.0)	3.73	0.85950
What I have learned during school-based teaching practice courses fits in terms of content, to what I have learned in my university-based courses	75	14 (18.7)	36 (48.0)	25 (33.4)	3.13	0.97722
In my school-based teaching practice courses, I have observed how teachers and other student teachers use similar teaching methods or theories I have learned about at the university	75	9 (12.0)	21 (28.0)	45 (60.0)	3.59	0.93134
Total					**3.41**	**0.62228**

(continued)

Table 1 (continued)

Perceived links over time in teacher education program ($\alpha = 0.717$)						
	N	Strongly disagree + rather disagree N (%)	Neither agree nor disagree N (%)	Rather agree + strongly agree N (%)	M	SD
Perceived opportunity to learn about key theories and research methods ($\alpha = 0.823$)						
During my teacher education programme, I have had the opportunity to …						
Read, analyse, or discuss subject matter theories (e.g. mathematics, history, science and social science) which are relevant for the teaching profession (e.g. literary theory, mathematical concepts, historical analyses, theories of social and natural sciences, linguistic theories, …)	75	18 (24.0)	25 (33.3)	32 (42.7)	3.16	0.98694

(continued)

Table 1 (continued)

Perceived links over time in teacher education program ($\alpha = 0.717$)						
	N	Strongly disagree + rather disagree N (%)	Neither agree nor disagree N (%)	Rather agree + strongly agree N (%)	M	SD
Read, analyse, or discuss "broad" educational theories (e.g. foundational theory about teaching and learning, developmental theories, e.g., Vygotsky, Piaget, Bruner)	75	16 (21.3)	17 (22.7)	42 (56.0)	3.44	1.05574
Read, analyse, or discuss educational theories that are relevant for a particular subject matter (e.g. research on teaching mathematics, language skills, teaching history, social sciences, languages, or other subjects)	75	14 (18.7)	34 (45.3)	27 (36.0)	3.23	0.90901

(continued)

Table 1 (continued)

Perceived links over time in teacher education program ($\alpha = 0.717$)						
	N	Strongly disagree + rather disagree N (%)	Neither agree nor disagree N (%)	Rather agree + strongly agree N (%)	M	SD
Read, analyse, or discuss general research methods which are relevant for the teaching profession (e.g. how to conduct educational research, qualitative or quantitative research)	75	25 (33.3)	15 (20.0)	35 (46.7)	3.15	1.11129
Read, analyse, or discuss research methods which can be used in my own classroom in order to assess students' learning progress (e.g. how to do "action research")	75	30 (40.0)	23 (30.7)	22 (29.3)	2.81	1.18200
Total					3.16	0.80625
Students' perspective on teacher educators' knowledge of the teacher education program ($\alpha = 0.798$)						

(continued)

Table 1 (continued)

Perceived links over time in teacher education program ($\alpha = 0.717$)						
	N	Strongly disagree + rather disagree N (%)	Neither agree nor disagree N (%)	Rather agree + strongly agree N (%)	M	SD
I am familiar with the vision of "good teaching" that my teacher education programme promotes	73	10 (13.7)	18 (24.7)	45 (61.6)	3.62	0.89179
I have heard similar views about teaching and learning across the courses in my study programme	73	4 (5.5)	20 (27.4)	49 (67.1)	3.74	0.74587
The teacher educators seem to know what is happening in other courses in the programme of study (e.g. key ideas, student assignments)	73	45 (61.6)	18 (24.7)	10 (13.7)	2.30	0.96731
The teacher educators seem to know what I am required to do in my teaching practice course(s)	73	29 (39.7)	20 (27.4)	24 (32.9)	2.84	1.04102

(continued)

Table 1 (continued)

Perceived links over time in teacher education program ($\alpha = 0.717$)						
	N	Strongly disagree + rather disagree N (%)	Neither agree nor disagree N (%)	Rather agree + strongly agree N (%)	M	SD
My teacher educators seem to know what the programme includes in its entirety	73	33 (45.2)	21 (28.8)	19 (26.0)	2.63	1.09933
Total					**3.02**	**0.71176**
Cohesion between different areas in the programme of study						
Overall, I perceive that my teacher education/training programme is organized in a way that all three key areas—subject science(s), subject didactics, and educational sciences are meaningfully interconnected	35	16 (45.7)	14 (40.0)	5 (14.3)	2.51	0.951

The distribution of results in the first dimension, which refers to cohesion of content(s) learned throughout the study, showed that the majority of participants (86.7%) consider that they had developed the ability to reflect on the ways in which their understanding of learning and teaching had developed (M = 4.05). More than two thirds of the student teachers (72%) observed coherence between ideas, contents, terms, and concepts which appeared in particular courses, while vertical congruence and alignment within the study programme was perceived by more than half of the students (57.3%). Less than half of the student teachers (46.7%) expressed agreement with the statement that courses within their study programme had been built based on the theoretical models of teacher competencies.

In their estimate of coherence between university-based courses and school-based teaching practice, 64% of students expressed agreement with the statement

that during school-based teaching practice they were able to try out teaching methods or theories they had been learning about in their university courses. Similar agreement (62.7%) was expressed in their estimate of the connectedness of theoretical knowledge in educational sciences and actual teaching practice in which they had participated. On the other hand, only a third (33.4%) of student teachers agreed on the existence of coherence between what they had been learning in university-based teaching methodology courses and teaching methodology school-based practice. It is interesting that the effectiveness of teaching methods used by school-based mentors was estimated as somewhat higher than effectiveness of methods used by university-based teachers. Overall, according to the participants' answers in this category, there was a significant number of those in the "neither agree nor disagree" category (from 28 to 48%) which indicates that students cannot perceive the relationship between courses which are university-based and practice in a real school situation.

In total, having opportunities to learn about key educational theories and research methods in their programme of study was not perceived by students as particularly high. From their perspective, slightly more than half (56%) had the opportunity to learn about and discuss broad educational theories and just under half of the students (46.7%) indicated having had opportunities to discuss general research methods. Only a little over a third of the students (36%) stated having had the possibility to analyse and discuss subject matter theories relevant to the teacher profession. Finally, 40% of the students expressed not having the opportunity to analyse and discuss research methods relating to students' learning progress during their studies.

The aspect of coherence which was perceived as lowest was university teachers' knowledge of the study programme in its entirety. Only 13.7% of student teachers stated that teacher educators know what is happening in other courses within the programme. Furthermore, students estimated that only about a third of their teachers (32.9%) know what is expected of students during teaching practice in schools. Also, just under a third of the students (26%) found that teacher educators are familiar with the programme of study in its entirety. Nevertheless, a significant number of students (67.1%) were of the opinion that they have heard similar views about learning and teaching in their courses across their study programme.

According to the participants' answers, the overall perception of coherence between CK, PCK, and GPK is low ($M = 2.51$) which means that despite studying in an integrated five-year programme developed for the purpose of establishing opportunities to interconnect various areas of teacher knowledge, students perceive coherence in their programme of study as weak.

5.7 Discussion and Conclusions

This research analysed selected elements of coherence in the programme for the education of class teachers from the perspective of students. Information on how students perceive their programme of study is important as attaining optimal learning outcomes for prospective teachers also significantly depends on the perception of learning experiences and opportunities for professional development during their studies (Canrinus et al., 2017, Cavana et al., 2021, Goh & Canrinus, 2019, Darling-Hammond, 2006).

The results of this research show that prospective class teachers in their final, fifth year of study, estimate that the connectedness between parts of the programme referring to CK, PCK, GPK and practice in a real school environment is not high. Students' highest perceived coherence in their programme of study estimate was observed for one element of structural coherence, i.e. coherence of contents and concepts within one course. If compared to students' estimates of vertical congruence between courses, the results are much lower. In other words, students do not perceive, to a greater degree, the connectedness between courses during particular years of study. This finding suggests that the requirements set in the initial stage of the programme development have not been entirely met. In conclusion, the initial expectation that more courses in different years of study would contribute to the development of particular teacher competencies by broadening content, establishing relationships between contents, and aligning learning outcomes, and manners of teaching and evaluation (Vizek Vidović, 2009) has not been entirely met.

The perceived coherence between university courses and school-based teaching practice also reveals an area in need of significant improvement in coherence between the mentioned elements of the programme of study. According to the students' perceptions, the connectedness between various theoretical courses, whether content-oriented or pedagogy-oriented (PCK and GPK), and teaching practice relating to particular subject areas, is less than satisfactory. Goh and Blake (2015) warn of the possible conflict of ideals (which are taught at the university) and the reality that occurs in school, which implies the need for creating opportunities for continuous student reflection on the relationship between what is being taught at the university and what they observe or are able to practice in school.

One of the reasons for initiating a university programme of study for class teachers in Croatia was to empower students to develop research competencies which could be used to conduct research in teaching, school, and the educational system which would in turn contribute to their professional development being

considered as research and evidence-based (Domović & Cindrić, 2009). However, the research results in this particular segment indicate a discrepancy between the official curriculum and the learned curriculum. According to the students' estimates, it seems that prospective teachers have not had sufficient opportunities for analysis and discussion of theories relevant for a particular subject matter nor have they sufficiently analysed research methods used in education or for monitoring their students' learning progress.

Of all the examined elements of coherence, student teachers perceive teacher educators' knowledge of the entire programme as the lowest. Yet, their estimate of the common vision and attitudes of different teachers regarding good teaching tends to be very high. This finding suggests that cooperation and coordination between teacher educators is not sufficiently represented when delivering the programme of study.

Overall, the results presented in this paper point to the need for improving the existing programme of study or developing a new programme of study for class teachers. In that case, it is necessary to start by deliberating conceptual coherence which implies the creation of a shared vision of a quality class teacher, i.e. quality programme of study. Its development should include all stakeholders and should take into account that the creation of a coherent programme is a continuous process which demands constant modifications (Canrinus et al., 2019, Cavana et al., 2021, Hammerness, 2006), which includes the understanding that coherence is not an objective outcome (Richmond et al., 2019). Considering the results of this research, the expected challenge is coherence of often "disconnected lands" (Bain & Moje, 2012, p. 62) whether it be those which represent particular domains of teacher education—CK, PCK or GPK, or those involved in university-based courses or school-based practice. In other words, an important requirement in the creation of a coherent and sustainable programme for teacher education is that "individuals take responsibility for moving beyond the individual course they teach and consider how this set of experiences fits into the program vision and into the scaffolding of learning opportunities across the program" (Floden et al., 2021, p.7).

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6 Assessing Student Perceptions of Professionalization Measures and Coherence after the 2011 French Curriculum Reform

Cindy De Smet and Christine Schmider

Abstract

This chapter examines the 2011 curriculum reform in France, which aimed to professionalize the teacher training system and establish national frameworks for teacher competencies in primary and secondary schools. Inspired by European guidelines for teacher education, this reform represented a paradigm shift in the French system, integrating pedagogical knowledge and pedagogical content knowledge alongside traditional content knowledge. The result was a closing of the professional orientation gap with other European teacher education systems and a greater vocational coherence.

Keywords

Coherence • Teacher training • Instructional design • Curriculum reform • French education system

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6.1 Introduction

Teacher education in many European countries has been undergoing profound structural and conceptual changes for years. The design and structure of teacher education, the process of acquiring the core competencies necessary for the teaching profession, and the effects of education and training on teachers and learners are topics that are prominent in current debates, both among research specialists and in politics and society. Expectations of the profession and of the professional competencies teachers are supposed to possess are immense. In regard to these expectations and societal demands, the practice of the profession is becoming increasingly complex (Neuber & Lipowsky, 2014, Rothland, 2013). A growing number of academic articles address questions about the prerequisites of future teachers as well as the development, measurement and assessment tools, and effects of professional competencies acquired by teachers (Cochran-Smith et al., 2008, Zlatkin-Troitschanskaia, Beck, Sembill, Nickolaus & Mulder, 2009). Criticism is often levelled at the fragmented structure of the various phases of teacher training, particularly the division between the study phases and the practical phase of training. There is a certain discontinuity, a fragmentation of knowledge and skills, as well as a curricular content that is not adapted to the requirements of the future profession and that cannot meet the complexity of the profession. One of the criticisms of the existing teacher training systems in Europe is that it is difficult to apply the fragmented knowledge and skills acquired during the years of study. As a result, future teachers have difficulty integrating and adapting their skills to the context of the profession (Blömeke, 2006; Terhart, 2004).

In response to Bologna and Pisa, curricular structures have been reformed in France, as well as in most other European countries, to focus on professionalization and competence orientation. (Le ministère de l'éducation nationale et de la jeunesse, 2013). The weight of the individual study elements and the relation between theoretical and practical components are also being reconsidered to achieve a more coherent and balanced vocational training (Baumert & Kunter, 2006; König, 2014; Wittorski, 2008).

The chapter's central research questions are twofold: 1) How has the 2011 French curriculum reform affected student perceptions of professionalization measures? 2) How do these results reflect coherence?

To answer these questions, we will first provide a brief overview of the organization of teacher education prior to the 2011 reform. After that, we will extensively discuss the 2011 reform and the role of competency-based education. Consequently, the chapter analyzes data from four cohorts of students enrolled in master education courses at the Inspé of Nice (Institut national supérieur du

professorat et de l'éducation) [or National Higher Institute of Teaching and Education] during the 2014–2015, 2016–2017, 2017–2018 and 2018–2019 school years. A survey was conducted to assess how students perceived the professionalization initiatives and actions imposed by the French ministries of education and higher education based on the national competence framework and guidelines.

Finally, the chapter provides an overview of the reform's results and reflects on how students perceive coherence. By examining the impact of the 2011 curriculum reform, this chapter contributes to a greater understanding of the role of coherence in professionalizing teacher training systems.

6.2 What Preceded the 2011 Curriculum Reform?

We need to make a distinction in the evolution of the organization of primary and secondary education. The initial training of primary school teachers remained the responsibility of teacher training colleges until 1989, when significant changes took place. The first of these colleges was established in Strasbourg in 1810. These institutions underwent a rapid series of transformations. Between 1978 and 1986 alone, there were twelve different schemes implemented for the initial training of teachers as well as thirty-eight successive official texts (Le ministère de l'éducation nationale et de la jeunesse, 2023a). In 1978, a significant change was made to the teacher training program for primary school education with the introduction of a three-year training program at teacher training colleges (Prost, 2013).

The training of secondary school teachers, or "professeurs certifiés", was historically organized in two distinct systems between universities and the regional pedagogical centers (CPR, or Les Centres Pédagogiques Régionaux). Universities focused on exam preparation, the regional pedagogical centers (CPR), created in 1955, for the training of probationary teachers after passing exams. This one-year training program at the CPR included classes on teaching methodology and disciplinary reinforcement, observation and practice hours with a supervising teacher, and part-time classroom teaching phase (4 to 6 h per week) whose validation was necessary for tenure (Le ministère de l'éducation nationale et de la jeunesse, 2023a).

Until the Education Orientation Law of July 10, 1989 (Loi d'orientation sur l'éducation, 1989, n° 89–486), primary school teachers and secondary school teachers in middle and high schools were trained using two completely separate systems. As a result, two distinct professional bodies existed with different statuses, career paths, remunerations, and retirement ages (Poucet & Prost, 2016).

The Education Orientation Law of July 10, 1989 brought an end to this situation by establishing the new position of "professeurs des écoles" (for primary school teachers), aligning their position with that of the secondary school teachers. The law also included an implication for teacher education at the university level, as the old teacher training colleges and regional pedagogical centers (CPR) were replaced by University Institutes of Teacher Education (IUFM, or Institut Universitaire de Formation des Maîtres).

6.3 The Centralized Reform of the Teacher Education in France

Compared to other countries, France was characterized by different educational particularities. Firstly, the country had a unique centralized public education system (Dobbins, 2014). Secondly, it is one of the only countries to condition the employment of teachers on the success of a national competition in addition to their university diploma (Le ministère de l'éducation nationale et de la jeunesse, 2023a, 2023b). And thirdly, the French pupils remain grouped together in secondary school until the age of 15. Only then did a differentiation begin.

Not surprisingly, teacher training in France has undergone an even more fundamental change in recent years than in most countries (Tardif & Petropoulos, 2012, Perrault, 2013). Until the reform in 2011, the Teacher Education system was traditionally characterized by a very low level of professionalization. A purely subject-focused first study phase (bachelor) without practical experience was followed by a second phase in which Pedagogical Content (PC), by which we understand knowledge and competences related to educational science, and Pedagogical Content Knowledge (PCK), defined as didactics of the discipline by Shulman (1987), were taught in an isolated way from the previous subject study (Bouvier & Obin, 1998). The focus on the subject-specific CAPES Concours (Certificat d'Aptitude Professionnelle à l'Enseignement Secondaire) [or Certificate of Professional Aptitude for Secondary Education Teaching], a centralized selection examination for all teacher candidates with a complete bachelor's degree in one subject, meant that teacher education students who obtained the CAPES gained access to the teacher profession and obtained civil servant status without ever having followed didactic or educational science related courses. In other words, only after students had completed a subject-related degree, prepared for the Concours after three years, passed the exam, and become a teacher with civil servant status did they meet pupils for the first time while having to teach with the full responsibility for the class (Jolion, 2011).

Following the Bologna reform and under the influence of European guidelines on educational standards, teacher training in France became professionalized with greater consideration of practical experience and subject didactics as well as a focus on competence orientation. In the academic year 2011–2012, a new framework of a consecutive study structure consisting of a polyvalent Bachelor's degree and a profession-oriented Master of Education as well as a competence framework for teacher education were enacted on a national level and implemented in all French Regional Education Authorities or "Académies" (Loi d'orientation et de programmation pour la refondation de l'école de la République, 2013, JORF n° 015). These 30 "Académies" are the decentralized services of the Ministry of National Education in France (Le ministère de l'éducation nationale et de la jeunesse, 2023c). Institutionally, this law fundamentally changed French teacher education. At the core of this new teacher training program was the idea of a coherent professionalization that focused on competence orientation.

6.3.1 Competence Orientation as a Key to Professionalization

As in most European countries, the educational reform that changed the French system aimed for 'competence-based' education. In educational science, competence has been understood as a construct and a performance disposition (Spencer & Spencer, 1993; Weinert, 2001) and increasingly defined and modelled in a context- and disciplinary specific manner through empirical research focusing mostly on cognitive aspects (Bobillon, Schmider & Zaki, 2017). Defined by Weinert as "the cognitive abilities and skills available in or learnable by individuals to solve specific problems, as well as the associated motivational, volitional, and social readiness and skills to use the problem solutions successfully and responsibly in variable situations" (Weinert, 2001, p. 27), the concept of competence in teacher education has evolved in the last few years. More recent subject-specific and transdisciplinary approaches in educational science have attempted to integrate non-cognitive elements into the construct of competence. A good example is the COAKTIV study which was one of the first empirical studies in the German-speaking world in which central facets of teacher competence were studied with regard to their relevance for classroom activities. For this study, the researchers took not only professional knowledge but also beliefs, motivational aspects, and self-regulatory abilities of teachers into account (Brunner et al., 2006). On the same level, König's interdisciplinary model of "professional competence is based on both aspects of professional knowledge and motivational factors, with the

professional knowledge being mostly subject-specifically defined whereas the other factors are largely interdisciplinary" (König, 2014, p. 23). The challenge for curricular developers directed by a competence approach is therefore to create a coherent chain of effects between the three elements: 1) teacher training, 2) teaching competence, 3) and student performance (Blömeke, 2003, Brunner et al., 2006; Terhart, 2012; König, 2014). Coherent teacher training creates competent teachers who improve student competences and performances. This means that being a good teacher is not innate, but rather the result of acquiring competences during a teacher training program and ultimately transmitting them to learners through competent teaching behaviour (Hattie, 2003).

A professionalization that sees itself as competence-oriented and also 'coherent' must therefore take into account very different dimensions and differentiate between them, among others, a temporal one (i.e. the coherence of the study program or the professional biographical process of the individual and between the different training phases), a structural one (i.e. the coordination of the individual elements in the curriculum), a conceptual one (the fitting of module structures, competence goals, and teaching–learning formats), but also an individually 'reflected' one (i.e. the interaction between the acquired competencies on one side and the individual dispositions as well as the understanding of the profession's roles and practices on the other) (Bobillon, Schmider & Zaki, 2017). The competence approaches of Pachler and Field (2001) or König (2014) for which such an integrative consideration of professional knowledge, professional understanding, and motivational factors are essential, can provide the theoretical blueprint and structural models for a coherent vocational competence orientation. The importance of an integrative approach for a sustainable theory–practice relation in teacher education programs should also be stressed if we want to avoid the fragmentation of the contents and different phases of the teacher training. Far too often, they are perceived as not coherently linked (Hammerness, 2006). Recent studies have underlined that the feeling of a coherent competence orientation and professionalisation depends largely on socio-cultural traditions or circumstances, on the education policy of each country, and on the training programs (Canrinus et al., 2015).

What does this mean for the reform of the French teacher education system and its pedagogical and curricular choices? Does the reform reflect the current research situation and the scientific standard in educational research? Does it take into account the necessity of a coherent competence orientation?

Our presentation of the French reform and the analysis of the student data we are assessing aims to answer these questions. The structure and the curricular

program of the French Master of Education considered a variety of the forementioned aspects. In a very French top-down movement, the ministry replaced the in 1990 created IUFMs with University Schools of Education, named "ESPE" (Ecole Supérieure du Professorat et de l'Enseignement) [or Higher School of Teaching and Education], which have since been responsible for the initial and in-service training of teachers in the Master MEEF (Métiers de l'enseignement, de l'éducation et de la formation) [or Professions in Teaching, Education, and Training] degree programs (Cornu, 2015; Le ministère de l'éducation nationale et de la jeunesse, 2023d). As mentioned earlier in this article, today these institutions are called Inspé. These new training centres were conceived as university faculties with the intention of enabling all future teachers to acquire interdisciplinary, profession-related competences, these are taught through transversal, interdisciplinary modules according to the educational standards set by the ministry within the framework of the so-called "culture commune" or the shared professional teaching culture. Teacher training for primary school, as well as lower and upper secondary school, consisted of the newly conceived Master MEEF degree program. This degree prepared students for the state exam while training future teachers in a more profession-oriented manner in addition to the subject-specific qualification. From then on, students not only studied at the university in the first Master's year, taking Content Knowledge (CK, or the body of knowledge such as facts, theories and principles), Pedagogical Content Knowledge (PCK) and Pedagogical Knowledge (PK, or practices and strategies of teaching) courses and passing the state selection examination, the Concours, they also spent half their time of the second Master's year teaching at a school (Le ministère de l'éducation nationale et de la jeunesse, 2015).

6.3.2 Coherence Through Exchange Between Theory and Practice

The reform assigned a pioneering role to the new ESPE Schools. They were meant to provide a closer interlinking of the theoretical components (CK, PCK, and PK) and practical school training. Practice-related aspects of the training program (internships, project work, student sponsorships, etc.) are supposed to reactivate disciplinary course contents, didactics of the discipline and competences acquired in the educational science courses, and clearly link them with each other or emphasize their interrelation. The newly created inter-institutional teaching teams, or the "équipes pédagogiques mixtes", are at the core of this exchange between theory and practice. In addition to the responsible persons

for the various subjects at the university and the teacher education professors, they also include secondary school teachers, school counselors, and mentors who together convey the training content and a coherent profession-oriented teaching–learning practice (Desjardins, Altet, Étienne, Paquay & Perrenoud, 2012).

The idea of a coherent teacher training program, in which theory and practice are not seen as independent domains but rather form two closely interlinked and fundamentally interrelated areas, is also supported by the systematic co-supervision of the students' teaching internship, their induction service which leads to their permanent teacher position and their master thesis. In the mixed tutoring, "the tutorat mixte", students are supervised during their teaching practice by a school mentor (tuteur établissement) and a specialized subject teacher from within the university (tuteur ESPE/Université) who together complete the school visits, evaluate the teaching, and supervise the master thesis. This arrangement allows the subject teachers a direct insight into everyday school life and—in the sense of feedback—valuable information for the design of their own courses and their coherent integration into the students' school practice (Michaud, 2016).

6.4 Assessing Student Satisfaction and Perception Following the Curriculum Reform

6.4.1 Methods and Metrics for Evaluating Educational Change

To evaluate the initial feedback and reactions of those primarily affected by the reform and its practice-oriented professionalization, namely the teacher education students, l'ESPE de l'Académie de Nice commissioned a survey in 2014. The survey aimed to measure the satisfaction with and perception of the 2011 reform. Students in the first year (Master 1) and second year (Master 2) of their master's program were asked to give their opinion on the study organization and its contents. The focus of the survey, which differentiated between first- and second-year students, was primarily on five indicators:

1. General satisfaction with the education program and core courses.
2. Relationship between and satisfaction with the disciplinary courses and the courses related to didactics.
3. Participation by school practitioners.
4. Internship evaluation and internship supervision.

5. State exam preparation: professional orientation (Master 1), tutoring, practical components and master thesis (Master 2).

6.4.2 Measuring Coherence

From the questionnaire, we selected questions that solicit a degree of coherence. First, we will discuss the overall course satisfaction, consequently we'll compare the satisfaction of the subject courses with the satisfaction of the courses related to didactics; observe the evolution of two cohorts from Master 1 to Master 2 and track their appreciation of disciplinary courses and didactic courses; and finally we will discuss the extent to which the courses were perceived as being useful during the internship, as well as the quality of supervision provided during that period.

6.4.3 Survey Versions and Participants

In total, we were able to rely on 4 surveys, namely for the academic years 2014–2015 (Boissicat, 2015) and 2016–2017, 2017–2018, and 2018–2019 (Calistri, 2017, 2018, 2019).

As shown in Table 1, a total of 518 students participated in these surveys, of whom 61% identified as female. This is a normal gender distribution for the secondary education context in France, where 58.4% of all teachers are female (Le ministère de l'éducation nationale et de la jeunesse, 2019). The distribution of students between Master 1 and Master 2 programs was roughly equal, with 244 students in Master 1 and 274 students in Master 2.

For the interpretation of the data, it is important to understand the difference between Master 1 (M1) and Master 2 (M2) students.

In France, the master's degree is a national diploma awarded by universities, commonly referred to as 'bac + 5'. It is accessible after obtaining a bachelor's degree, also known as 'bac + 3'. However, in the case of teacher studies, they consist of a two-year program. For the students involved in this research, the M1 students focus on the disciplinary-oriented state exam concours which is taken at the end of their year, whereas M2 students spend half of their time at the university and half at a school in their own class, teaching as fully responsible teachers.

Tab. 1 Table of participants

		Students	Female	Male	Other
2015	M1	92	65	25	1
2017	M1	59	33	26	
2018	M1	46	26	19	1
2019	M1	47	23	23	1
	244				
2015	M2	107	67	40	1
2017	M2	95	53	42	
2018	M2	34	18	16	
2019	M2	38	32	6	
	274	**518**	**317**	**197**	**4**

6.5 Results

A whole series of aspects stand out in the evaluation of the respective indicators of coherence.

6.5.1 General Satisfaction

In Fig. 1, we present the overall satisfaction with the courses. We observe two main conclusions: First, course satisfaction rises over time for M1 (Master 1) students, while the M2 (Master 2) satisfaction remains more or less stable. Second, the satisfaction of M2 students is lower than that of M1 students.

A possible explanation for the difference in general satisfaction between M1 and M2 students could be the confrontation with the reality of teaching and the associated practical shock that begins for M2 students.

6.5.2 Relationship Between Subject Science and Didactics

Figure 2 shows the satisfaction of our student teachers with their disciplinary and didactical courses.

We can conclude that M1 students value both disciplinary and didactic courses more highly than M2 Students. The trend in Fig. 2 follows the general satisfaction

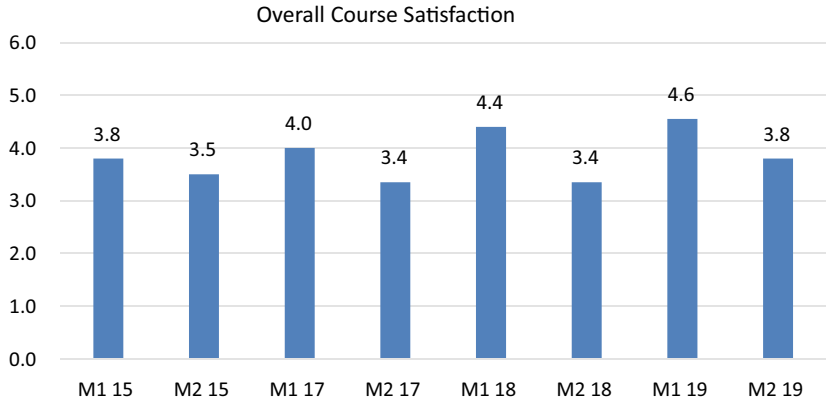

Fig. 1 Overall course satisfaction

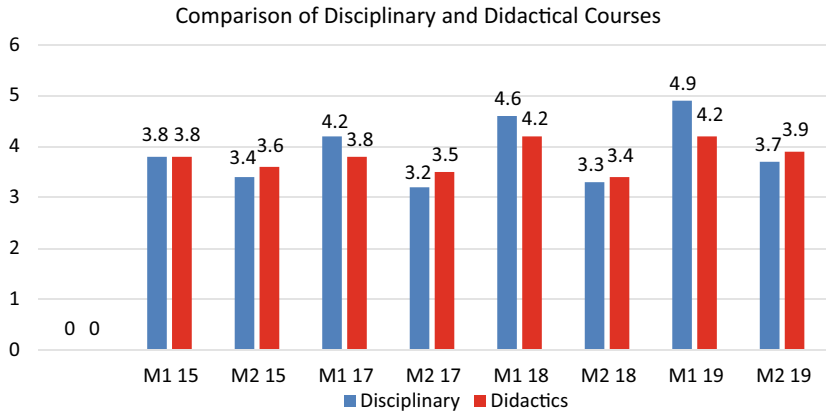

Fig. 2 Comparison of disciplinary and didactical courses

depicted in Fig. 1, where disciplinary course satisfaction rises over time for M1 students, however this is less explicit for their didactic courses. M2 satisfaction remains stable for both disciplinary and didactic courses.

A possible explanation could be the amount of time devoted in the course program to disciplinary and didactic courses for M2 students. The legislative authority decided to allocate less time to disciplinary courses during Master 2 in

favor of the practical aspects of the job (Jolion, 2011). As a result, students' priorities shift after passing the disciplinary-oriented state exam concours (in Master 1) in favor of training that can be labeled as "practice-relevant". Nonetheless, this data indicates that both types of courses are necessary, but disciplinary courses remain vital even when student teachers assume the role of the teacher in their own classroom during their internship.

6.5.3 Cohort Evaluation

The following delves further into this subject and examines the evolution of two cohorts from Master 1 to Master 2 in order to demonstrate how their satisfaction of disciplinary courses and didactic courses changed over time. For instance, the M1 students of 2016 progressed to become the M2 Students of 2017.

Figure 3 shows that all the observations of Fig. 2 remain consistent. Although the data is not of a multitudinous nature, we note that the gap between disciplinary and didactics courses narrows for the 2017–2018 cohort.

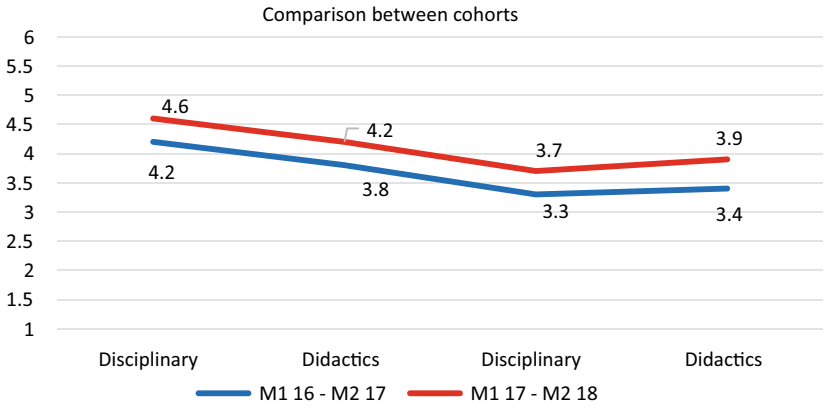

Fig. 3 Comparison between cohorts

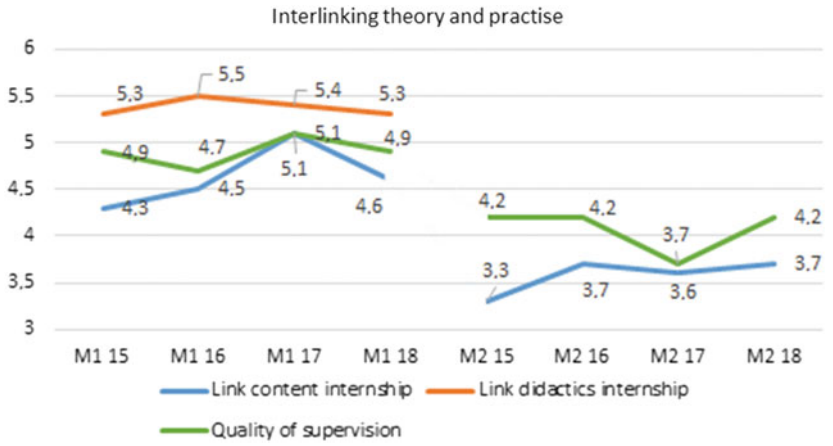

Fig. 4 Interlinking theory and practise

6.5.4 Interlinking Theory—Practice

Figure 4 shows to what extent the internships allowed M1 students to discover the approach of analyzing practice and to implement it, the extent to which the courses taught at the Inspé were useful during the internship, as well as the quality of supervision provided during that period. It is important to note that this figure connects the data points for interpretation, and does not imply the presence of multitudinal data as it involves different groups.

The red line in Fig. 4 shows that M1 students have a stable vision on how the internship helped them to understand didactics and to implement it. Commenting on this, we can say that during the first internship in M1, student activity is mainly limited to observation. Therefore, their evaluation is not yet based on actual teaching.

The blue line in Fig. 4 also shows a decline in the satisfaction of usefulness with the courses taught in M1 compared to M2 (link content internship). This observation follows the previous one.

Lastly, the green line in Fig. 4 shows us that M2 students are less satisfied with quality of the supervision. This can probably be explained by the evaluation criteria being much broader in M2 than in M1. As a result, the personal impact of this evaluation is greater in M2.

6.6 Discussion

At the beginning of this article, we posed the following two research questions: 1) to what extent has the 2011 French curriculum reform influenced students' perceptions of professionalization measures and 2) what insights can be drawn from these findings regarding the coherence of the results.

To address the first research question, we once again refer to Fig. 1, which illustrates that satisfaction with disciplinary courses increased over time for M1 students, while the trend was less pronounced for their didactic courses. Additionally, satisfaction among M2 students remained stable for both types of courses. These findings are further supported by Fig. 3, which indicates that the gap between disciplinary and didactic courses narrowed for the 2017–2018 cohort. While it is uncertain whether the 2011 curriculum is solely responsible for this upward trend over time, teacher educators may have already integrated the reform, leading to increased course satisfaction and consequently influencing students' perceptions.

Regarding the coherence of the results, we can conclude that any modern teacher education system is built upon professionalization and the coherent integration of theory and practice. As such, future teachers evaluate their training based on these two components. While their feelings about the training may be subjective and their understanding of the teaching profession fragmented due to limited experience, their perception is crucial for the development of their professional awareness.

6.7 Conclusion

Our findings highlight the need for curriculum developers, teacher educators, researchers, and political stakeholders involved in educational policy to take students' perceptions into account. The most well-designed educational training program is futile if students fail to recognize its value and purpose.

Unfortunately, we do not have data from all of the academic years since the reform. It would be interesting to compare the evolution of trends. Additionally, it should be noted that the observed trends are not statistically significant as the data is not normally distributed, and that we do not have information on whether the data is representative.

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7 Co-Constructing Multidisciplinary Coherence in Subject Teacher Education: Students' Reflections in Group Discussions

Anssi Roiha and Pilvi Heinonen

Abstract

This article examines how disciplinary coherence is (co)constructed at the student-oriented level in pedagogical studies at the University of Turku. Based on group discussion data, we analyze how coherence is (co)constructed in planning a mutual multidisciplinary learning module on the topic of sustainable development. The focus is on how students talk about their own discipline and its specific nature in relation to other disciplines and the multidisciplinary modules. From the perspective of (co)constructing coherence in relation to multidisciplinary modules, three different types of coherence building discourses were identified from the data. It was interesting how, on the one hand, one's own discipline and subject boundaries seem to be valued, and on the other, how this subject-orientation is questioned and seen as problematic. Based on our findings, we discuss how the participants' discourses of multidisciplinarity relate to the conceptualization of different dimensions of disciplinary coherence (i.e., inter-, multi- and transdisciplinary) and what this means for the development of teacher education.

Keywords

Coherence • Multidisciplinarity • Interdisciplinarity • Transdisciplinarity • Pre-service subject teachers

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7.1 Introduction

Coherence has already been on the agenda for teacher education for some time (e.g., Canrinus et al. 2019; Darling-Hammond et al., 2017; Hammerness, 2006) and it can be approached from different perspectives. Coherence can be divided into conceptual and structural coherence, although they often partly intersect (Hammerness, 2006). Conceptual coherence refers to, for example, an appropriate combination of theory and practice or a shared understanding of the teaching that underpins the whole program. Structural coherence may manifest in alignment of courses around a particular educational concept or organizing the courses in a way in which they build on and reinforce one another. Coherence can also be approached through the dimensions of horizontal and vertical coherence (Broad et al., 2013). The former refers to coherence during the studies whereas the latter refers to coherence across the entire teacher education program. According to Boning (2007), a coherent education program is one in which students can make connections and integrate knowledge, as opposed to a set of disconnected individual courses which provide individual and isolated chunks of information. Coherence can refer to connections within several dimensions, for instance, within disciplines (Faulconer et al., 2020) or between theory and practice (Grossman et al., 2008). In this study, however, our focus is primarily on coherence across disciplines (e.g., Gentzler, 2003) and how it is co-constructed by the participants in group discussions where they talk about multidisciplinary learning.

Although coherence is often presented in an overly positive sense, Richmond et al. (2019) aptly highlight that coherence is not an entirely unproblematic concept. They argue for a certain built in flexibility in order to challenge future teachers to explore alternative ideas and realities. Instead of having an achievable endpoint, coherence should be viewed as an ongoing process that involves all relevant parties collaboratively negotiating coherence. However, Tatto (1996) suggests that coherence does not necessarily mean complete harmonization of the program since diverse thinking adds richness to the learning experience. Instead, she advocates that the learning is organized in a coherent manner.

In this article, we focus on the coherence of teachers' pedagogical studies at the University of Turku, Finland and, more specifically, in one course of subject didactics, where multidisciplinarity is one of its key elements. Subject-specific didactics has a strong tradition in Finnish education (Kallioniemi & Virta, 2012). Harju-Autti et al. (2021) aptly point out that the term subject-specific didactics can itself be interpreted as a term associated with a single subject. Lehtonen et al. (2018) criticize teacher education for maintaining unnecessary

dichotomies, whereby information from opposing perspectives does not meet. Such dichotomies include natural versus human sciences, fact-based knowledge versus experiential knowledge, as well as the knowledge produced by the individual compared to the knowledge produced by the community. In this study, we are interested in the relationship between two perspectives, that is, subject-specificity and multidisciplinarity.

We approach coherence across disciplines through the related concepts of *multidisciplinarity*, *interdisciplinarity* and *transdisciplinarity*. These concepts are often used interchangeably although they can be taken to mean slightly different things (e.g., Alvargonzález, 2011; Choi & Pak, 2006). Multidisciplinarity refers to the exploration of a unifying theme from the perspective of different subjects while maintaining clear boundaries between them (Choi & Pak, 2006; Drake & Burns, 2004; Klein, 2010). Conversely, transdisciplinarity means integrating sciences and perspectives in a way that transcends their boundaries. Connections are thus being built between disciplines or entirely new areas of knowledge are being created (Choi & Pak, 2006; Drake & Burns, 2004; Klein, 2010). According to Aarnio-Linnavuori (2018), transdisciplinary learning takes time and is challenging to implement as a one-off lesson or short module. Cantell (2017) suggests that transdisciplinary learning resembles transformative learning (e.g., Mezirow, 2006), since it questions current paradigms and critically reflects on the so-called truths in the existing world. Interdisciplinarity can be seen to fall somewhere between the two approaches above. In interdisciplinary learning, the integration of disciplines is more profound than in multidisciplinary learning but less strong than in transdisciplinary learning. The different disciplines are still kept independent but links and relationships are created between them (Choi & Pak, 2006; Drake & Burns, 2004; Klein, 2010). According to Choi and Pak (2006), multidisciplinarity, interdisciplinarity and transdisciplinarity can also be described by the words *additive*, *interactive* and *holistic*, respectively. It is important to note that, to some extent, these concepts are overlapping and the same terms can refer to slightly different issues in different contexts. It is therefore interesting to examine how student teachers themselves understand and conceptualize multidisciplinarity in our data in relation to their own subject and discipline.

In this article, we examine how the participants' understanding of disciplinary coherence in teaching and learning unfolds in group discussions organized in a course focusing on multidisciplinarity. First, we will provide a brief overview of the course in question and its structure. Our focus, however, is on the students' perceptions of multidisciplinarity and how it is implemented and how different subjects are linked together in a multidisciplinary learning module. In this article, we address the following research questions:

RQ1: How do the participants co-construct the understanding of multidisciplinary learning in the group discussions and what discourses for building disciplinary coherence can be identified in the group discussions?

RQ2: What is the participants' relationship with their own subject in relation to multidisciplinarity, interdisciplinarity and transdisciplinarity?

7.2 Context of the Study

The context of this study is the University of Turku, Finland, where students complete their teacher's pedagogical studies during one academic year. Altogether, the studies are worth 60 ECTS credits, which consist of 20 ECTS of educational sciences, 20 ECTS of subject-specific didactics and 20 ECTS of teaching practicum. The subject didactics and teaching practice components of the studies are mainly carried out in their own subjects. Conversely, all students, regardless of their subject, attend the education lectures. However, the lectures are relatively lecturer-centered and there is not a strong emphasis on cross-disciplinary collaborative work.

In this article, the context of our data is the course: subject-specific didactics III. As part of this course, there is a series of lectures common to all students on educational topics that permeate all teaching. The lectures are offered on a variety of topics, such as multiliteracy, differentiation and sustainable development. Students can choose the lectures they attend and must attend a total of 16 h of lectures. An additional part of the subject-specific didactics III course is a multidisciplinary module that students plan. This is to prepare them for their future work as teachers, as the Finnish national core curriculum for basic education requires at least one multidisciplinary learning unit to be implemented each year. The lectures described above are meant to underpin and inform the planning of the multidisciplinary modules, which we describe in more detail in the following section.

7.3 Multidisciplinarity in the National Core Curricula

The Finnish national core curricula provide a solid basis for disciplinary coherence. The curricula use the term *transversal competence* to refer to *an entity consisting of knowledge, skills, values, attitudes and will* (the Finnish National Agency for Education = FNAE, 2014, Sect. 3.3). The National Core Curriculum for Basic Education outlines seven transversal competencies, such as *cultural*

competence, *multiliteracy* and *ICT competence*, the aim of which is to *support growth as a human being and to impart competences required for membership in a democratic society and a sustainable way of living* (FNAE, 2014, Sect. 3.3). The six corresponding competences in the National Core Curriculum for General Upper Secondary Education include *multidisciplinary and creative skills*, *ethics and environmental competences* and *global and cultural competences* (FNAE, 2019, Sect. 6.2). In addition to these transversal competences that should transcend all learning, the curriculum for basic education stipulates that the education provider ensures that pupils' studies include at least one multidisciplinary learning module per academic year. The multidisciplinary modules contribute to the development of the transversal competences introduced above.

However, despite the disciplinary coherence promoted by the curricula, they are nevertheless very much fragmented into specific subjects and outline subject-specific objectives and content in each subject. Moreover, the approach to disciplinary coherence in the curricula is rather moderate. First, the curriculum for basic education uses the term *multidisciplinary learning* to refer to the modules in which phenomena are approached through different subjects. As discussed in the introduction, this term denotes a learning process in which subject boundaries are maintained (cf., interdisciplinary or transdisciplinary leaning). Secondly, the transversal competencies are also approached from a subject-specific perspective. The national core curriculum for basic education states that *each subject builds the pupil's competence through the contents and methods typical of its field of knowledge* (FNAE, 2014, Sect. 3.3). The curriculum for general upper secondary education talks about the transversal competencies in a similar vein.

7.4 Previous Studies on the Topic

Disciplinary coherence among pre-service teacher education has been the subject of some international research (e.g., Fitzgerald et al., 2021; Tanase & Lucey, 2017). The topic has been looked at from many perspectives, including team teaching (e.g., Coleman et al., 2023), online learning (e.g., Geiger et al., 2018) and curriculum implementation (e.g., Brand & Triplett, 2012). However, due to the scope of the present study, in this article we will concentrate only on studies carried out in the Finnish context, which provide background for our own research.

Disciplinary coherence in subject didactics is a rather unexplored terrain and there are only a limited number of studies that have examined Finnish pre-service teachers' views on multidisciplinarity, interdisciplinarity and transdisciplinarity.

Harju-Autti et al. (2021) explored 32 pre-service subject teachers' views on a multidisciplinary project carried out as part of their university studies. The authors were interested in how students saw the link between the experience of the joint project and their future working life. In the joint project, the students were tasked with designing a course for upper secondary school students that would combine the subjects of all the students in the group. The students came from two main disciplines, that is, foreign languages and social studies (i.e., history, philosophy, communication, psychology and political sciences). Overall, the students were very positive about the project and felt their perspectives were broadened and widened as a result of the multidisciplinary collaboration. The students described the project as having lowered the threshold for designing multidisciplinary courses in the future and as having generated insights into new cross-curricular projects.

Tarnanen et al. (2019) examined what pupils (n = 250), teachers (n = 25) and student teachers (n = 23) reported having learned in a multidisciplinary learning project with 5-8th graders. The students reported learning interaction skills to work with diverse groups of students and text production skills. The teachers reported learning more about co-operation with colleagues, the process of the interdisciplinary work and about their pupils. The student teachers highlighted learning about their own strengths and weaknesses, group dynamics, collaboration and the organization of the multidisciplinary unit. The authors conclude that their study showed that in a multidisciplinary learning approach, a teacher's role is very different from that of traditional teaching and learning. A teacher is more of a facilitator than a purveyor of knowledge and learning is very student-centered which can pose its challenges. The authors suggest that their experiment shows that the multidisciplinary skills and subject-specific skills can be studied in parallel, which is in line with the ethos of the Finnish national curricula.

Cantell (2017) explored pre-service subject (n = 69) and primary teachers' (n = 35) perceptions of the benefits and challenges of multidisciplinary learning. The results showed that, overall, the pre-service teachers' attitudes towards multidisciplinarity were positive. The participants felt that a multidisciplinary approach can provide a better overall understanding of the content, compared to a subject-based approach. However, many also perceived combining multidisciplinarity and different subjects as challenging. Lack of familiarity with multidisciplinary working and negative attitudes towards other subjects were mentioned as challenges.

Pre- and in-service teachers' attitudes towards disciplinary coherence can be assumed to have a direct impact on how it is implemented in schools. Venäläinen et al.'s (2020) study showed that there is room for improvement in how

the multidisciplinary modules in basic education are organized. They tend to be mainly projects or theme days and are thus characterized by their one-off nature. Pupils' involvement in the design of the multidisciplinary modules has also been limited and the design has not sufficiently taken into account the content objectives of the subjects. The assessment of learning during these modules has also proved problematic. On the other hand, the multidisciplinary modules have increased teachers' co-planning and collaboration. The authors conclude that a more in-depth focus on transversal competences as an objective of basic education would require more time for teachers to discuss and share good practices together. Teacher education should also prepare future teachers to take better account of multidisciplinarity in their teaching.

7.5 Methods

Our research data consist of group discussions between teacher students of different subjects (e.g., foreign languages, Finnish language and literature, mathematics, history and social studies) recorded in autumn and spring 2021.[1] The data were collected as part of one of the general educational lectures on the topic of climate skepticism as a pedagogical challenge, which was an online lecture organized on Zoom. At the end of the lecture, the participants were asked to reflect in groups on how the topic of the lecture could be used in the design of a multidisciplinary learning module. In three separate group discussions, the students collaboratively tried to plan a multidisciplinary learning module around the lecture topic. Altogether, 12 students participated in the group discussions. The data comprises three audio- and video-recorded group discussions, totaling approximately 40 min, which have been transcribed verbatim.

The participants were asked for written consent before the lecture and they were informed about the study in advance with a detailed privacy notice. In the data extracts, the participants are anonymized and no information that could identify an individual participant has been included. The data has been stored securely on platforms provided by the university and is accessible only by the research team.

[1] The group discussions are part of the data for an ongoing research project in which researchers from different disciplines are working together to develop research-based teacher education for future subject teachers. In addition to the authors of the present study, the research group comprises the following researchers: Jan Löfström, Eija Yli-Panula, Anuleena Kimanen and Riia Kivimäki.

In this study, we focus on the ways in which pre-service subject teachers jointly construct multidisciplinary coherence and their perceptions of the planning and designing of multidisciplinary learning modules. We aim to link the exploration of disciplinary coherence emerging from the data to a conceptualization of multidisciplinarity along the interdisciplinary-multidisciplinary-transdisciplinary axis.

For the data analysis, we apply discourse analytic and linguistic research methodology (e.g., Fairclough, 1992; He, 2017; Juez, 2009). The guiding thread of the analysis is the linguistic choices participants make in the discussions to build coherence between different disciplines and subjects as well as the thematic tendencies that can be identified in relation to multidisciplinarity. We pay attention to the thematic and topical aspects of the discussion, the linguistic means and choices participants use to structure the relationship of their own subject and discipline to other subjects and disciplines, and the commonalities and interdisciplinary connections they build in the discussion.

7.6 Findings

From the group discussion data, we have identified three discourses through which disciplinary coherence in the design of a multidisciplinary learning unit was built: 1) the discipline/subject-oriented discourse of integration, 2) the broad unifying discourse and 3) the holistic discourse of change.

7.6.1 The Discourse of Discipline-Based Integration as a Coherence Builder

In the group discussions, a strong subject-oriented discourse was a very common way of building disciplinary coherence in the design of a multidisciplinary learning module. In this case, interdisciplinarity is seen above all as a somewhat mechanical integration of different disciplines:

> *1) If you want to make some banners for school, that could be one way of doing something like a full day, just to bring different subjects together. That hey let's write*

multilingual posters about how you can make a difference or what decisions we can make. That could do some good. (GD2/21)[2,3]

The subject-oriented discourse of integration reflects, on the one hand, the subject-oriented tendencies of the Finnish national curricula and, on the other, the strong subject-orientation in the participants' pedagogical studies. In this discourse, multidisciplinary teaching is constructed and understood primarily from the viewpoint of one's own subject, as illustrated by the following extracts:

2) My major is geography and minor biology. This climate change is according to the curriculum quite strongly present in our subject, of course it's in all subjects but substantively, it's particularly in our subject. (GD1/21)

3) I really started to think about this from a factual point of view, that in geography it's possible to look at the effects of climate change and perhaps also ways of preventing it. From both the natural and human point of view, to see what effects society has on this and how climate change affects society. (GD1/21)

In extract 2, the theme of a multidisciplinary learning module is linked to the content of the curriculum and the topic is considered a core theme from the point of view of the participant's own subject (*this climate change is according to the curriculum quite strongly present in our subject*). In extract 3, the interlocutor's subject-based orientation is reflected in the way they indicate the possibilities offered by their own subject to address the multidisciplinary theme (*in geography it is possible to look at the effects of climate change*). We interpret this as indicating not only a subject-based orientation, but also a strong subject-oriented identity among pre-service subject teachers, which is also reflected in extract 4, in which the participant emphasizes the specific possibilities of their subject in dealing with a multidisciplinary theme:

4) Especially when the teaching of religion and especially the teaching of ethics has its own special nature - exactly in general the classes of religious studies provide a very special opportunity to reflect on one's own living environment, worldview, personal opinions and ethics so that if it could be extended to other subjects, it would be a great thing. (GD3/21)

[2] The code refers to the number and recording year of the group discussion.

[3] The quotes are direct translations from the group discussions held in Finnish. They have been slightly edited for the sake of clarity, for example by removing filler words and hesitation sounds.

As a coherence-building discourse, the discipline/subject-based integration discourse is rather mechanical and pragmatic. This is reflected in the linguistic formulations in the group discussion, for example in the way one's own subject is described as a subject that is easy to include in the multidisciplinary learning module, as illustrated by the following extract:

> *5) The first thing that came to mind was all the materials in language lessons that can be easily changed, or to use some texts on the subject or even encourage someone to search for information in the target language, or even organize a debate on the subject. Surely it would be easy to include English, in particular. (GD2/21)*

The mechanistic and pragmatic nature of the discourse is also reflected in the orientation of the interlocutors in that multidisciplinarity is conceived as a pedagogical activity in which all subjects are exhaustively included in one way or another, sometimes artificially as in extract 7 below:

> *6) You can really include all the subjects in it [=multidisciplinary learning module]. At least you can include some kind of links to all the subjects. (GD2/21)*
>
> *7) Well, P.E. is perhaps a bit more difficult to include, perhaps there could be something like climate change tag or something. (GD2/21)*

Particularly extract 7 highlights an orientation in which teaching and content are approached through different subjects rather than relevant phenomena and themes. Although the curriculum states that all subjects take turns in implementing the multidisciplinary learning modules, this should be done in a way that is appropriate to the module in question.

In this discourse, the construction of multidisciplinary coherence is reflected in the linguistic structures, for example in the verb choices reflecting orientation. Multidisciplinary coherence is verbalized by *including*[4] (extract 8) or *embedding* (extract 9) content or themes that do not fundamentally belong to one's own subject, which at the same time underlines the subject-oriented and mechanical nature of the discourse in relation to the construction of coherence:

> *8) In maths you can include all sorts of bigger things that you might not think of at first. I did a lesson on taxation in maths recently where we went through the history of taxation. (GD2/21)*

[4] The original Finnish verb "*ympätä*" in these examples is semantically elevated and carries a metaphorical meaning of forced association. This contributes to underlining the subject-oriented nature of the discourse.

9) It's relatively easy to embed a climate perspective in social studies and history, but it was interesting how through foreign language teaching you can expand that perspective to a more global direction. (GD3/21)

Alongside the discourse of embedding things in one's own subject, extract 9 also illustrates the construction of another type of coherence in relation to multidisciplinarity: expanding and broadening the scope of the topic from the viewpoint of one's own subject. This way one's own subject is seen as a platform against which to expand the construction of knowledge across disciplinary boundaries and through which to develop pupils' transversal competences, as extract 10 also shows:

10) It seems to me that dealing with these issues in a foreign language helps the students to understand and comprehend the issue because it's dealt with in a global way. It also involves the learners in the global discourse. And when they feel that they understand and have the vocabulary, it's perhaps easier to understand, then perhaps it would also broaden their views and their own opinions in some way. (GD3/21)

These last two data extracts (9 and 10) reflected a slightly deeper understanding of multidisciplinarity compared to the other extracts with more mechanistic approach, also reflecting the ambiguity of the construction of multidisciplinary understanding. Therefore, they resemble the next level of discourse we have identified, that is, the broad unifying discourse, which we will discuss in more detail next.

7.6.2 A Broad Unifying Discourse in Building Coherence

Another coherence building discourse that emerged from the group discussions was the discourse that draws more explicitly on transversal competences. We have labelled this discourse a broad unifying discourse in building coherence. Rather than a mechanical combination of subjects, this discourse shows more clearly that the coherence and integration between subjects in multidisciplinary work is outlined explicitly in terms of the multidisciplinary theme, as opposed to the content or objectives of individual subjects, as illustrated by the following extract:

11) This is something that can be brought up in all subjects, for example in subjects like home economics and then in mathematics, so it's a really multidisciplinary topic. (GD1 /21)

In the broad unifying discourse, multidisciplinarity is conceived as a coherent and goal-oriented entity, in which the viewpoints of different subject areas offer their distinct perspective on the theme at hand (see extract 12). The disciplines are seen as intersecting in addressing the transversal theme (see extract 13) and the contribution of each subject is described as providing its own dimension to the transversal work, through which the common theme can unfold in an interesting and instructive way:

> *12) This would be a very interesting multidisciplinary learning module if the same topic was discussed from slightly different perspectives in different subjects. It could shed some light on it for the students in a very interesting way. (GD3/21)*

> *13) How to get the students to activate their own thinking about what else could be done and what they could do themselves? And then what countries can do, what cities can do? There are links to quite many subjects here, but I think that these things can be dealt with in foreign language classes as well. When they are discussed in the target language, the pupils learn the language and vocabulary and at the same time they learn about this topic. Then if these important topics were addressed in every subject, it would become perhaps more self-evident to them. (GD3/21)*

Finally, the broad unifying discourse also reflects the ethos of building multidisciplinary coherence, in which the integration of subjects (see extract 14, *tie them together more*) or a multidisciplinary joint project (see extract 15) can provide students with meaningful experiences and at the same time create the conditions for connecting the subject matter more explicitly to the surrounding society. In this way, multidisciplinary work also enables pupils to experience participation, which is considered one of the key cornerstones of multidisciplinary work (FNAE, 2014).

> *14) I also thought that if you tie them [=different subjects] together more, it can bring more the experience that it's really meaningful and do something useful and then on the other hand if you tie them together you might get more involved in the surrounding society. (GD3/21)*

> *15) In social studies we want to encourage pupils to be active in society, so it's a good way to include the language so that they would start - somehow through participation and they could take part in an international project so that they could practice the language at the same time and then it would be a kind of joint project. (GD3/21)*

One feature of the broad unifying discourse is that, in it, the objectives for multidisciplinary work that are common to all subjects are described. In this discourse, when describing multidisciplinary work, perspectives that unite the subjects and

build coherence are sought from broader unifying agendas regardless of the subject. For example, in addressing climate change, pupils are guided to understand that there is potential and hope for action to solve problems such as sustainable development:

> *16) Something that I think is perhaps important in all subjects is that there is hope that we can do something about this and that we can have an impact, and somehow I would see this as something that unites all the subjects. (GD1/21)*

7.6.3 The Holistic Discourse of Change

The third coherence-building discourse in our data is the holistic discourse of change. This differs from the discourses above in that it describes disciplinary coherence in multidisciplinary work as an ideal for the future and a kind of change that is still to come.

From the perspective of building coherence, the holistic discourse of change can be seen as a kind of counter-discourse to the subject-based integration discourse, as within this discourse, students are sometimes very clear in their criticism of the fact that subjects have been kept so separate (see extract 17) and subject boundaries have been too closed (see extract 18). At the same time, this discourse reflects a desire for change, which shows that students have an embedded ideal of multidisciplinary work and the teaching of broad learning units (see transversal competences in the curriculum, FNAE, 2014), specifically as a non-subject-oriented pedagogical activity.

> *17) I feel that the subjects have been kept so separate that it's high time to change it a bit. (GD3/21)*

> *18) More active demonstration that something can really be done and that this works. I'm thinking a bit more broadly than from the viewpoint of language teaching, but then if I think about my own English teaching, the language is always a good element in it, but somehow I would like to take ways from other subjects as well and not to have such closed boundaries when it comes to such broad learning modules. (GD3/21)*

Although the above quotes reflect the holistic discourse of change, the students are still relatively moderate in their views, which is reflected in their choice of words (e.g., "*a bit*" in extracts 17 and 18 and "*ways*" in extract 18).

The holistic discourse of change can be seen as reflecting the ideal put forward by the curricula of multidisciplinary work as a long-term and pervasive approach, as illustrated by extract 19:

> *19) It would be kind of ideal that maybe I also like things to be constantly in the background to some extent that they are addressed in a slightly broader context than just that we had a theme day and now it's over and it was about climate change this year. (GD2/21)*

The above example brings to the fore a mild criticism that multidisciplinary work is easily reduced to a single theme day instead of relating it to a broader context. The fact that the discourse seems to reflect the ideal of the curricula and to indicate only a possible future direction is reflected throughout in the conditional forms (e.g., *would*) which are very typical of this discourse.

This discourse clearly shows how students have been socialized to understand the basic principles of multidisciplinary work, through which a coherence regarding linking subjects is also built in this discourse. Extract 20 illustrates that students describe multidisciplinary work as a long-term activity, ideally as an organic part of teaching that is sufficiently long-lasting (see also the curriculum, FNAE, 2014), preferably the entire academic year:

> *20) It's a good point that a theme day can be just fine but it would be more important to try to make it an organic part of the teaching so that it would be present throughout the school year to make people think and also try to provide up-to-date information and to justify things with facts. (GD2/21)*

Through the holistic discourse of change, multidisciplinary work is described as cooperation between teachers, based on a common set of values and common guidelines through which the unification of teaching is seen as possible. Coherence in multidisciplinary work is then built through a jointly constructed broader pedagogical understanding and by taking into account the understanding of the same theme built up by other subjects in the teaching of individual subjects. It is clear that this kind of pedagogical work requires strong pedagogical collaboration, as the following extract illustrates:

> *21) We would all be in favor of such cooperation that we could take things from the methods of other subjects and from the things that are going on there about the same topic and make it a bit more uniform so that one teacher doesn't say one thing and another one says another but that they would be in accordance with the values of the curriculum and the school. Then more broadly for the guidelines to be clear, it would need this kind of cooperation between teachers in the school and a common view in*

a particular school so that these things could be taken forward pedagogically. (GD3/21)

In the holistic discourse of change, it is sometimes quite clearly expressed that genuinely multidisciplinary work that brings subjects together is seen as desirable and valued, which is typically reflected in various evaluative expressions (*great*, *useful*, *meaningful*; see extracts 14 and 22). From the viewpoint of building coherence, however, multidisciplinary cooperation is sometimes described as something for which there are still practical obstacles in today's school, such as a lack of resources:

22) I think it would be great if there were some schools with the resources to be able to combine, for example, religion, history and social studies so you would get a really great multidisciplinary module, for example, from the perspective of climate change combined with for example foreign languages, geography, biology... just about any subject really. (GD3/21)

7.7 Discussion & Conclusion

This article examined the participants' perceptions of disciplinary coherence in group discussions organized in a course focusing on multidisciplinarity. The findings imply that the students had different attitudes towards disciplinary coherence. Most of them approached it in a rather mechanical way through their own subject, resembling the ethos of multidisciplinary learning (Choi & Pak, 2006; Drake & Burns, 2004; Klein, 2010), which is strongly underpinning Finnish education. Others, in turn, expressed views that approached disciplinary coherence in more depth and even linked it to interdisciplinary and transdisciplinary approaches (Choi & Pak, 2006; Drake & Burns, 2004; Klein, 2010). However, they too did not seem to perceive the disciplinary and multidisciplinary approaches as a dichotomy, but rather as a meaningful combination of both. On the other hand, as future subject teachers, they were clearly oriented towards the clash between the ideal of multidisciplinary teaching and the practical realities. Even if teachers are motivated and willing to implement multidisciplinary learning through co-teaching, the current school culture and teaching resources do not necessarily support this.

Many factors may influence the participants' attitudes towards multidisciplinarity. Firstly, the organization of their studies and their entire subject didactics

part can easily lead them to analyze things by default mainly from the viewpoint of their own subject. This orientation may have been influenced by the way in which the students have been guided to understand the importance of multidisciplinarity in subject teaching. It is possible that there has not been a clear and coherent view on this among the teacher educators either. In the future, the program could be developed in a way so that the importance and modelling of multidisciplinary teaching and the links between different subjects in multidisciplinary work are made more explicitly visible. Additionally, the fact that the participants are future subject teachers and not primary school teachers may be an argument in favor of a more subject-oriented approach. The participants mainly study a single subject and its didactics, which is naturally more important in their pedagogical thinking than for primary teachers, who have to master a broader range of subjects. As a result, primary teachers are presumably more likely to combine subjects and seek links between them.

The age of the pupils may also be a factor. Subject teachers typically work with older pupils than primary school teachers. Multidisciplinarity is often approached in greater depth with younger pupils, while more subject-specific issues are explored with older pupils. For example, the International Baccalaureate curriculum follows an inquiry-based, transdisciplinary curriculum framework in primary school, whereas at the secondary level, the approach is more interdisciplinary and disciplinary (International Baccalaureate, n.d.). Similarly, in Finnish upper secondary schools, the tendency is more towards a disciplinary rather than multidisciplinary approach, although the latest curriculum has introduced 6 transversal competences encouraging more multidisciplinary learning. However, the matriculation examinations at the end of upper secondary school do fairly little to reflect multidisciplinarity. Although from 2023 onwards, they will also include multidisciplinary tasks that can build on the transversal competences introduced in the curriculum. It will therefore be interesting to see how the development of multidisciplinarity will progress in upper secondary schools and matriculation examinations and what kind of washback effect (see e.g., Kuang, 2020) it may have on teaching. Multidisciplinarity is therefore clearly an aspect that will be emphasized in the future and which must also be taken into account more clearly in teacher education. Even if the degree of multidisciplinarity defined in the curricula can be perceived as quite moderate compared to a transdisciplinary learning approach, it seems imperative to address the topic with future teachers in a deep and profound way, as it has not yet taken root very strongly in the field (e.g., Venäläinen et al., 2020).

Some students challenged or questioned certain fixed traditions and practices related to school and teaching. Questioning subject orientation was one example, and some expressed the view that strict boundaries between subjects should be abandoned (see also Cantell, 2017). Participants also highlighted the importance of collaboration in achieving the ideal of multidisciplinarity. Rather than just physical co-teaching, they emphasized more the shared values and views on pedagogy that each teacher can implement and convey in their own teaching. As Juuti et al. (2015) also emphasize, teachers can implement multidisciplinary teaching on their own by incorporating interdisciplinary content, perspectives and methods in their teaching. This could be assumed to be relatively natural, as many of the disciplines themselves are already inherently interdisciplinary.

Multidisciplinary learning has been presented as a solution or alternative to strong textbook-based teaching (Kujamäki, 2014), which is very strong in Finland in all subjects (e.g., Hiidenmaa et al., 2017). The students' quotes also reflected a vision of implementing multidisciplinary teaching in ways other than using textbooks. As working methods, multidisciplinary learning is often associated with phenomenon-based learning, which has been implemented in many Finnish schools (e.g., Symeonidis & Schwarz, 2016), as well as inquiry-based learning (Pedaste et al., 2015). These were implicitly referred to in the group discussions. However, none of the students challenged another feature of traditional schooling, namely, learning in age-structured groups. In some schools, it is precisely multidisciplinary learning modules that have been implemented across grade levels (see e.g., Tarnanen et al., 2019).

Overall, the participants seemed to be searching for a meaningful balance between a subject-oriented and multidisciplinary approach to teaching. This balancing act can also be observed in the curricula which try to marry disciplinary and multidisciplinary learning in a coherent way. What is then the ideal level of multidisciplinarity in teaching? Does a subject-based approach have its place at school as the main approach to learning or should there be a shift towards stronger multidisciplinary learning? How can we achieve a meaningful and appropriate approach between the two and how can the right balance ever be found for every situation and every individual? In the future, these issues will certainly be increasingly considered by curriculum developers, teacher educators and individual teachers alike. In order for us teacher educators to be able to guide future teachers in taking account of multidisciplinarity, we ourselves must first be aware of its complexity and related dimensions. The question we must ask ourselves is what kind of disciplinary coherence are we aiming for and what challenges or gaps might such coherence bring with it.

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8 Exploring Coherence between Teacher Education and the Competence Required to Facilitate Students' Oral Participation in Foreign Language Classrooms

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Abstract

This chapter reports on a case study aimed at exploring how newly qualified Spanish teachers perceive coherence between their recently concluded teacher education programme and their own acquired competence in facilitating oral activities in the classroom. Our starting point is that the core components of sensing coherence are comprehensibility, manageability, and meaningfulness. Our findings indicate that teacher education is perceived as comprehensible and meaningful in terms of facilitating oral participation. However, the findings also indicate that teacher education, both at the university and in practice schools, has room for improvement regarding the facilitation of oral activities.

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Keywords

Sense of coherence • Core practice • Oral participation • Teacher education • L3 classrooms • Teaching moves

8.1 Introduction

Many newly qualified teachers do not perceive that they are adequately prepared for professional teaching practice in schools (Dahl et al., 2016), and teacher education programmes are criticised for being fragmented and disconnected from practice (Caspersen & Raaen, 2014; Conway & Munthe, 2015; Hatlevik & Smeby, 2015). These challenges have gained the attention of research on coherence in teacher education (Canrinus et al., 2017; Hatlevik & Havnes, 2017; Klette & Hammerness, 2016). Klette and Hammerness (2016) describe coherence as "a consistent approach to teaching and learning that informs programme construction both within coursework, across courses and between fieldwork and university classes. A coherent programme has a set of courses that are conceptually linked, is designed to deliberately build understanding of teaching over time, and has careful alignment between university coursework and field placements" (p. 29). However, Canrinus et al. (2017) argue that the core of the coherence problem is the extent to which student teachers perceive the study programme as coherent. However, as opposed to student teachers, newly qualified teachers may have an even more thorough understanding of coherence and how the teacher education programmes prepare for professional practice. Therefore, the main objective of this chapter is to discuss the findings from a qualitative study of three qualified Spanish teachers' perceptions of coherence between their newly concluded teacher education programme and their own acquired competence which is required to facilitate students' oral participation in the foreign language classroom. This knowledge is important for making qualitative improvements in teacher education programmes.

8.1.1 Sense of Coherence in Teacher Education

Antonovsky (1987) claims that the concept of "sense of coherence" includes the following three core components: comprehensibility, manageability, and meaningfulness, which are important motivating factors of human behaviour. In teacher education, comprehensibility refers to a student teacher's perception of

educational content as understandable. Manageability is the student teacher's confidence in his/her ability to develop skills or access the support and resources required to master educational and professional demands. Meaningfulness refers to the student teacher's perception of educational content as relevant and useful for professional practice in school (Hatlevik & Havnes, 2017; Lejonberg & Hatlevik, 2022). We define the scope of this study from the language didactics point of view. We operationalise "sense of coherence" by investigating what the newly educated teachers do in their classroom teaching and how that corresponds to what is emphasised in teacher education, skills such as promoting a safe learning environment, increasing motivation, and creating tasks that involve oral participation and systematic use of the language. We argue that the connection to professional practice in teaching at the university by emphasising core practices such as facilitating oral participation, is important for promoting student teachers' sense of coherence in our teacher education programme.

8.1.2 Facilitating Oral Participation as an Essential Core Practice for Foreign Language Teachers

The teacher plays a crucial role as a facilitator of students' learning (Hattie, 2011), and facilitating students' oral participation in the classroom is a core practice for all teachers (Grossman, 2018). Core practices are identifiable components that teachers enact to support learning and "consist of strategies, routines, and moves that can be unpacked and learned by teachers" (p. 4). In *Talk Science Primer*, which is part of the curriculum for student teachers at the University of Oslo, Michaels and O'Connor (2012) define talk moves as "strategic teacher moves designed to open up the conversation and support student participation, explication, and reasoning" (p. 7). Thus, in this chapter, we use the term *teaching moves* to describe specific methods, strategies, techniques, and activities that the teacher may use to facilitate students' active engagement, particularly oral participation and production.

As oral production is a prerequisite for language learning, it is among the language activities described as part of the communicative competence in the Common European Framework of Reference for Languages (CEFR) (Council of Europe, 2020). It is also necessary to implement the action-oriented approach stressed by the CEFR. Moreover, students' oral production is particularly stressed in the Norwegian curriculum for foreign languages, with communication as one of the subject's "core elements" with the largest number of *competence goals* (KD, 2019). However, the stated importance of communication in general, and of oral

communication in particular, does not necessarily translate into good oral practices in the classroom. On the contrary, one of the most widespread challenges teachers report on is the difficulty in creating an appropriate learning environment, as well as motivating students to language use and oral production. For this reason, facilitating students' participation in oral activities in the classroom is a highly relevant and indispensable core practice for foreign language teachers and is thus a key competence that student teachers should acquire in teacher education.

8.1.3 Oral Participation in L3 Classrooms

According to the general focus on communicative competence (Canale & Swain, 1980) and the *action-oriented* approach stressed by *CEFR* (Council of Europe, 2020), the learner is given a prominent position as "user and social agent" (p. 29) whose communicative needs should regulate the learning process. Nevertheless, in foreign language (here L3) classrooms, the schoolteacher's role as a facilitator of oral production is crucial. Teachers should be able to facilitate goal achievement by ensuring that their students have the desired active role (Mezzadri, 2006). Successful teaching moves aim at creating opportunities for students to engage in meaningful interactions in the target language through communicative activities such as role-plays, discussions, and debates. Being often the only language role model in the classroom, teachers should provide students with the necessary and adequate linguistic input (Vold & Brkan, 2020) as well as feedback to improve their language skills and build their confidence in speaking. They should also encourage students to use the language in real-life situations and help them develop strategies to overcome communication barriers. Oral production in the L3 language classroom, as part of general oral participation, can only be achieved through oral participation and depends on many factors.

8.1.3.1 The Role of Affective Elements in the Learning Environment and Oral Participation

With language learning being highly dependent on the ability to communicate and use the language, a number of studies have stressed the importance of the so-called affective elements in the language classroom in either facilitating or getting in the way of oral production. In addition, most L3 classes in Norway[1]

[1] L3 languages have a semi-optional status in the Norwegian school system. At the lower secondary level students are required to choose between an L3 language or alternative and

comprise students from parallel classes and are consequently mixed groups, with students converging from the different permanent classes at the same grade level. The fact that L3 pupils don't know each other very well can affect group cohesion (Dörnyei & Kormos, 2000; Dörnyei, 2001). Thus, L3 languages are subjects where the learning environment can be seen as an issue to be taken into consideration, not only because of the possible impact on students' satisfaction and learning (Carrai, 2022), but also because of the "anxiety reactions to situations in which one might make use of the target language" (Gardner & MacIntyre, 1993, p. 2). Language classroom anxiety, considered a specific component of the language learning process (Dörnyei, 2005) as well as language motivation and satisfaction with the chosen language (Dörnyei, 2018; Dörnyei & Kubanyiova, 2014; Carrai, 2014; Dörnyei, 2001), is recognised as an impeding factor with a negative effect on language performance and learning (Oxford, 1999). Further, the importance of the learning environment as a counteractive measure to language classroom anxiety and for the promotion of oral language production has been underlined with wide consensus by studies on the role of group cohesiveness in L2 motivation (Dörnyei & Kormos, 2000). Group dynamics (Dörnyei, 1997) and a pleasant and supportive atmosphere (Dörnyei, 2001) are commonly considered key elements for succeeding in the language classroom and contributing to students' satisfaction. This indicates that facilitating oral participation and production is also dependent on the teacher's ability to lower anxiety levels, actively work to create a positive and supporting learning environment, and build group cohesion (Dörnyei & Kormos, 2000) and a playful dimension in the classroom (Caon & Rutka, 2004).

In summary, teaching moves need to work on two different and interdependent fronts: on the one hand, they should promote activities that enable and create the practical conditions for the students' oral participation and production; on the other hand, they have to minimise the obstacles impeding this participation while promoting the conditions which support the right learning environment.

competing subjects such as In-depth Studies in Norwegian, English or Math, or Skills for Working Life, all with an equivalent number of teaching hours. At the upper secondary school level, students who have chosen a programme for general studies (a university-preparatory programme) are obliged to study an L3 language for at least 2 years (either they continue with the same language, or they change to a different one).

8.1.4 Research Question

Enabling teachers to promote oral participation involves applying the principles of comprehensibility, manageability, and meaningfulness to the L3 classroom both as a relevant part of teacher education and as a way to develop teachers' own professionalism. In the case of L3 oral participation and production, this can be considered the moves teachers use to create activities directly promoting oral participation and production, removing the obstacles impeding the same participation—that is, lowering language classroom anxiety and creating a safe learning environment—and finally, paying attention to their own use of the target language as a way to stand as input and stimulus to students' use of the language. To address this challenge, we investigate the following question: *How is the teacher education programme coherent with the needs of L3 teachers when it comes to facilitating oral participation and production?*

8.2 Methodology

The project was designed as a qualitative case study (Stake, 1978, 2006) that explored how newly educated Spanish teachers facilitated oral activities in the classroom and how they strengthened students' motivation for oral participation. The study is based on two types of data sources: observations of newly educated teachers while teaching in their classes and interviews conducted with these teachers.

The study was approved by the National Data Protection Services (NSD). All participants signed an informed consent form.

8.2.1 Participants and Context

The participants in this study were a small group of three female Spanish teachers, which can be categorised as purposeful selection (Maxwell, 2013). This means that they were selected because of their ability to inform, specifically since they acquired their qualifications through the University of Oslo 1-year post-MA teacher education programme during the spring of 2022, and they are three of the six ex-students in this category currently employed in schools. The fact that they were available and willing to participate contributed to establishing a productive relationship (Maxwell, 2013, p. 99), especially considering the setting of the study involved a close observation of their teaching practice. Although this

selection method allowed the feasibility of access and data collection, it might also raise concerns of validity, which pertain to the limitations of this study and which were partly addressed by collecting data on two separate occasions and with two different methods, as mentioned above.

The Teacher Education programme (60 ECTS) in which these teachers were enrolled consists of three parts: pedagogical knowledge, subject didactics, and 60 days of teaching practice in schools. The programme is designed as three integrated courses (10 + 20 + 30 ECTS) which both contain pedagogical courses, subject didactics courses, and school practice. The courses are integrated in that they have common descriptions of learning outcomes and common exams in which students display pedagogical and subject didactic knowledge and link it to lessons learned from teaching experiences in schools. The programme is centred around four main themes: (1) teaching and learning, (2) classroom environment and management, (3) assessment of learning and (4) adaptive teaching and differentiation. The educational provision covering the pedagogical content/part of the programme is organised as lectures for the whole cohort of students and seminars in groups of about 30–40 students for the different teaching subjects. The specific L3 didactics part of the programme is organised into seminars for all of the L3 languages to be taken together as well as seminars specific to each language. During the first and second term, the seminars integrate themes 1 and 2, associating them with the specific components of language didactics. The third term includes themes 3 and 4. In particular, the promotion of oral activities in the classroom is a recurrent topic during the general L3 seminars about productive competences, motivation, and learning environment, as well as during the language-specific (Spanish) seminars about oral production and interaction.

8.2.2 Data Collection

The data collection comprised observations of Teacher 1 and Teacher 2, as well as interviews with all three teachers. Due to complicated schedules, observation of Teacher 3 was not possible in the timeframe of this study. The participants were informed that we wished to observe a "regular lesson". The premise for the observations was that the teachers would teach in their own classroom as usual but with a special focus on whether and how they eased students' oral participation. This means that we focused on the specifically designed oral tasks, general activities that could include oral production, and other, even unplanned, occasions during the lesson during which the students could be motivated to speak the language. We also observed how the class reacted to oral tasks and

how motivated the students appeared in taking advantage of the opportunities they were given to practice their oral skills. The target of our focus on students' participation was to identify the possible challenges that teachers face during class in order to discuss this topic during the interviews.

The structure for our observations is partially derived from the *teaching plan* that teachers are trained to use in our programme. It is based on two categories that summarise and concretise how we intended to analyse the objects of our observations: (1) planned oral activities, and (2) other teacher's moves, that is, activities or strategies indirectly promoting oral participation and production. For each category, we observed both the teacher's and the students' roles, the resources used for the activity, how the activity considered the specific classroom context (and possibly was adapted to it), and lastly, how the teacher used the target language.

The data collection took place in January 2023. The three teachers work in schools in the Oslo area, which differ in level but are more or less the same size; that is, they are average-sized classes with approximately 25 students. Teachers 1 and 3 had a group of students consisting of a Spanish upper secondary level 2 class, while Teacher 2's group was a Spanish lower secondary level 1 class.[2] Regarding their experience as teachers of Spanish, all three teachers had some previous experience, and Teachers 1 and 3 had several years of experience as part-time substitute teachers before enrolling in the programme. The interviews with Teachers 1 and 2 were conducted after the observations, while Teacher 3 was interviewed on Zoom. The purpose of the interviews was for the teachers to elaborate on their experienced challenges in motivating students for oral participation and to identify possible needs for improvements in teacher education regarding preparing student teachers for facilitating oral participation. The interview guide was divided into two main areas: questions regarding the teachers' acquired competence in facilitating oral practices and the general role of teacher education. The first area includes (1) the purpose and the preparation of the lesson, and (2) the lesson itself, which also includes the topic of the teacher's self-consciousness of his/her own oral production or use of the target language.

[2] Level 1 corresponds to CEFRs A1-level and can be achieved either during the lower secondary school (grades 8th to 10th) or during the upper secondary school (grades 11th and 12th). Level 2 corresponds to CEFRs A2-level and is achieved during the upper secondary school.

The second area includes (3) the teachers' reflections about their own teaching practice. This area also sought to collect comments related to the recently completed teacher education programme and to their perception of coherence between the programme and professional demands.

8.3 Findings and Discussion

In what follows, we present the most relevant findings to answer and discuss the research question regarding coherence between our teacher education programme and the actual needs of L3 teachers in the classroom.

As stated in the introduction, we chose to concentrate on the general need for different teaching moves aimed at facilitating oral participation in the classroom. The use of these kinds of moves during the lessons as well as the teachers' critical reflections about their own practice and the eventual unfulfilled needs during the interviews can be interpreted as outcomes of their acquired professionalism. Further, the interview data on the teachers' self-reports of their experience during the teacher education programme and later on as newly educated teachers can account for their eventual perceived coherence.

In particular, we categorised teachers' moves into two sub-categories: (1) the moves that teachers use to actively promote oral participation and production and (2) how they manage to ensure a safe and supportive environment, which is an indirect prerequisite for oral participation and production.

Since the two observed lessons differed in content, level (of the class), and attention paid to oral practice, we chose to present and discuss the results of the observations dealing with *the kinds* of activities that were specifically planned to facilitate students' oral production, as well as other activities that could *indirectly* lead to oral production despite not directly targeting it.

Based on the topic, the findings from the interviews are partly integrated in the discussion about teachers' moves or on perceived coherence. In the case of coherence, the findings are displayed using the following two categories, tapping on the coherence between the indications received during the teacher education programme and their practical experience with the actual teaching: (1) acquired competence and coherence between plan and execution of the lessons, and (2) reflections and feedback.

8.3.1 Teachers' Moves to Promote Oral Participation and Production

During the observations and interviews, we paid attention to the moves that the teachers enacted which were aimed directly or indirectly at stimulating students' oral participation and oral production. The teachers in this study both exemplified different moves throughout the lesson in the classroom and later described them during the interviews.

The teaching moves are divided into two distinct categories according to our findings: the indirect job teachers perform using the target language in the classroom that aims at exposing the students to and getting them acquainted with the language, and the practical activities that target the students' oral response.

8.3.1.1 Use of the Target Language

All three teachers showed (or reported) that they use Spanish in the classroom. Teacher 1 used the target language during an activity of eliciting the conjugation of some verbs orally and by producing short and simple sentences during the explanation of the activities, even if these were translated immediately into Norwegian. Teacher 2's use of Spanish, despite the low level of competence of this class, was extensive, systematic, and intentional. She used it to give simple instructions, to comment on the students' participation, and to encourage more oral production. The students appeared to understand and follow the teacher due to the use of transparent words, repetitions, and slow diction. Teacher 3's account of her own use of the target language revealed an even more proactive strategy; she reported using Spanish almost the whole time, and being extremely conscious of her diction, choice of transparent words, and use of body language.

These findings indicate that the three teachers recognise the importance of the teachers' role in this matter, although to different extents. This is especially important in the L3 context because of the lack of exposure to the language in the students' real life and of the teacher frequently representing their sole oral input, especially in the Norwegian context, where it has been found to be insufficient and subject to debate (Vold & Brkan, 2020). The frequency of use of the target language in the classroom contributes to "normalising" it as a practical means of communication for the students. According to the CEFR's action-oriented approach, learners should practice with real-life tasks and be able to "do things" in the language (Council of Europe, 2020). An attempt of such can be seen in Teacher 1's use of Spanish to give short instructions, whereas Teachers 2 and 3 showed a more systematic use of Spanish. The systematic use of an L3 language might also depend on how confident the teacher is in using it, and Teacher 3's

greater use of the language than Teacher 1 or Teacher 2 might be due to Teacher 3 being a native speaker, even though this cannot necessarily be considered as the only reason (Vold & Brkan, 2020).

8.3.1.2 Oral Production

In the planned actions targeted at promoting the oral use of Spanish, the various examples we encountered during the observations could be ranked from little action-oriented (Van Patten, 2002) activities, such as direct response to teacher plenary questions (which could be answered both in the mother tongue and in the target language), to more task-based activities, which the students had to complete by using the language orally as a form of production or for interaction. All three teachers were observed or reported using these plenary talks in the L3 classroom, for example, in eliciting answers to questions on a text, in translations, or simply as a way to consolidate a topic. These activities do not require a direct and extensive oral production or interaction but limit the use of the language to a simple response or an answer, even expressed by a single word or verb without the need for complete or complex sentences. Teacher 1 mostly used plenary talks during our observation, but this might not be representative of her teaching moves since her lesson had to be improvised due to technical problems in the classroom. Teacher 2 also used plenary talk to recall the students' prior knowledge about the conjugation of certain verbs that were functional to the successive oral activity.

Regarding more action-oriented activities, we observed an example in Teacher 1's playful "verb-conjugation relay", in which the students were divided into two teams to compete against each other. In this team race, one person from each team had to complete a task (conjugate and translate a verb form), tag the next person, and so on until the teacher stopped the activity. The competition appeared to be an engaging experience for the whole class; moreover, the students moved from the level of the single word or verb to the composition of simple sentences.

Teacher 2's entire class was planned to promote oral participation and production, and the lesson goals were explained to the students at the beginning of the class. During the lesson, we observed various activities, the starting point of which was a plenary talk recalling students' prior knowledge of the topic of verb conjugations, which were functional. This was followed by more task-based activities on two different (but related) topics, including short dialogues based on model texts produced by the teacher and requiring oral interaction among the students. The first activity started as a dialogue in pairs (between students sitting near each other) that exchanged roles according to the structure of the model text. During this part of the activity, the teacher went around to the different pairs and helped. The activity was then extended to become an interaction

involving the whole class: the students were asked to stand up and move around the class, performing the same dialogue with the remaining students. During the entire activity, the teacher was an active part of the interaction, acting as one of the partners in the dialogues, especially with the most hesitant students. The second activity followed the same pattern as the first one, with dialogues in pairs at the desk to start with and interaction with the rest of the class afterwards. The difference was that the dialogues this time were based on the use and exchange of physical objects (slips of paper, content of their school bags, etc.), so this was more of a real-life task (Van Patten, 2002) in which the students had to interact in Spanish using the language as an essential means for them to get the object they needed. The lesson concluded with two consolidating moves (Klette, 2020): a plenary listening activity to an authentic recording on the same topic as the second activity and a Kahoot game.

We did not observe Teacher 3's lesson; thus, we relied on collecting data from her self-reports about lesson planning during the interviews. She reported planning her lessons to allow for alternating between different language competences, including oral production and interaction. Her lessons were characterised by frequent variation between the use of playful activities, plenary talks, short dialogues with the teacher or in pairs, students' production of videos and the use of clickers (e.g. Kahoot and Quizlet). The moves reported by Teacher 3 were not so dissimilar to those of Teacher 2, but we could not observe them. Nevertheless, her methodical use of clickers, such as *Duolingo Classroom,* aiming at personalising the tasks to the single student, gave us the picture of conscious and systematic attention to real-life tasks that encompassed a form of oral participation, if not production and interaction.

Lastly, all three teachers proved to be attentive to the special needs of their students. The perception of a manageable task or the feeling of getting the help they need is an important aspect of students' L3 motivation (Carrai, 2022) and can be the key to language production. Following this principle, Teacher 1 monitored the development of oral production by going from pair to pair and helping during the task. Teacher 2 also intervened directly by performing the task with some of the most reluctant students and later by taking part in the oral interaction with the whole group. Teacher 3 adopted an even more preventive approach to adapting the language or the difficulty of the activity by differentiating the tasks on *Duolingo* and assigning them to the different students according to their progression.

8.3.2 The Promotion of a Safe and Supportive Environment

All three teachers considered language classroom anxiety as an impeding factor for oral production and reported choosing different approaches to this challenge. Teachers 1 and 2 seemed to make large use of playful activities both as ice-breakers and as methods to lower the anxiety level, especially regarding oral participation and production. Teacher 3 chose a more preventing strategy: she concentrated on language sounds by organising competition based on repeating difficult words without knowing their meaning. This kind of activity is not directly related to students' oral production per se but can indirectly strengthen students' self-confidence regarding pronunciation and improve the learning environment by creating a relaxed atmosphere in the classroom and ultimately group cohesion. Concerning supporting students' general L3 motivation and oral production, Teacher 3 used the *Duolingo classroom* as an instrument for vocabulary training, with challenges adapted to individual students. She also gave her students positive reinforcement for effort instead of achievement. Compared to Teacher 3, who did not struggle much with a lack of students' participation, Teachers 1 and 2 found it challenging to engage all the students. Teacher 2 solved the problem by taking direct action, having short dialogue-like interactions with individual students or asking direct questions during plenary activities.

The findings from both observations and interviews demonstrated general agreement among the three teachers about the importance of a safe learning environment, and all of them showed great attention to the classroom dynamics and environment during their activities. Teachers 1 and 2 intervened during the oral activities, strengthening the students' perceptions of support from the teacher (Dörnyei, 2001). However, part of the observations and of the interviews was dedicated to the question of the affective elements as impeding factors to oral participation and production.

The verb-conjugation relay in Teacher 1's class aimed at promoting a relaxing atmosphere and managed to make the students concentrate on the task without the burden of language classroom anxiety (Dörnyei, 2005). As a playful activity performed in competing teams, it also contributed to group cohesion (Dörnyei & Kormos, 2000). Lowering the students' anxiety level (Carrai, 2014) could have also been an essential contribution to the success of the activity, both in terms of participation and practical L3 production. Teacher 2 seemed to work actively and systematically to promote a relaxing and supportive environment by setting the mood for every lesson with music videos, organising playful activities, such as *Kahoot*, and planning tasks that facilitate oral production without exposing individual students in front of the class. In fact, both oral activities demanded

that the students speak simultaneously, which made it impossible for the single students to be heard by someone other than the student in the same pair. Further, both activities supported group dynamics because of the continuous change in partners (Dörnyei, 2001). The possible anxiety connected to oral performance was also reduced by the role of the teacher going around and supporting a single student. Teacher 3 presented examples of strategies directed at strengthening the learning environment, such as the use of *clickers* in groups, but also showed a preventive attitude in regularly playing with the language together with her class on two levels. On the one hand, she organised playful activities and rewarded effort instead of achievement, which proved to be a clever way to lower performance anxiety (Caon & Rutka, 2004). On the other hand, the use of body language and training with the sound of Spanish without having to concentrate on meaning can contribute to creating a safe and playful environment.

8.3.3 Acquired Competence and Coherence Between Lesson and Preparation

When asked to give feedback to our teacher education programme during the interviews, the three teachers seemed to agree on the importance of teacher education in preparing them for their role as teachers in general and as teachers of Spanish, even though all three teachers had some degree of previous experience.

Regardless of their experience as teachers before teacher education, they reported several aspects of the programme that they found particularly useful for their profession and had some remarks concerning specific topics or parts of the programme. A recurrent topic during the interviews is the place for or amount of necessary pedagogical and didactic theories in the programme. As our teacher education programme is organised around the three components of pedagogy, (language) didactics and teacher practice, it is clear that each different component has a different field of pertinence that must complement the others. The findings from the interviews might show some confusion around the perceived integration of the components, and therefore the application of these in order to satisfy the professional demands encountered in the classroom.

Teacher 1 reported particularly appreciating the topics chosen in language didactics and the more structured and guided teaching experience during the practice period. Nevertheless, she would have liked an even more practical approach to the different challenges in the classroom, not necessarily only those concerning language teaching. For this reason, she expressed the need for more examples and specific techniques to deal with students. Teacher 2 was especially appreciative of

the integration of didactics and pedagogy but was dissatisfied with her experience with the practice school and mentor to whom she was assigned, indicating few examples and teaching practices that were not consistent with the action-oriented approach stipulated by the CEFR (2020) and the Norwegian curriculum (2019). However, Teacher 3 was very satisfied with the programme, citing her theoretical background as a base for her practical approach to teaching.

According to what we observed and what was reported by the teachers during the interviews, the three teachers internalised and put much of the theory and examples from the pedagogical and didactical components of the programme to practice. From the language teaching point of view, the findings from both the observations and the interviews showed the teachers' awareness about the specific topics of oral participation: they recognised the need for specific teaching moves to promote oral participation and production and devoted much attention to ensuring a safe learning environment. Both of these elements are consistent with specific courses in pedagogy and language didactics. However, one could argue that the extensive use of plenary talks and the lack of situations suitable for spontaneous oral production are not entirely in agreement with the aim of facilitating oral participation. The former is because the context of the entire class can be a kind of element and teaching move (Gardner & MacIntyre, 1993) that does not facilitate or impede the use of the language. The latter is because, according to the CEFR (2020) and the Norwegian curriculum (2019), spontaneous language production and interaction should form part of general language competence. The above-mentioned moves could therefore represent a form of lack of coherence with both the pedagogical and the didactical components. A confirmation of this can be found in the three teachers' recognised experience of oral participation and production as still a challenge. The role of the third component of the programme, that is, the practice in schools, should provide the student teachers with the necessary practical moves.

8.4 Concluding Remarks

As this is a qualitative study containing observations of two and interviews with only three participants, there are limitations regarding the richness of the data and insights gained from our study. Despite its methodological limitations, our study allows for in-depth and detailed exploration of the experiences, perspectives, and behaviours of the participants. Thus, our study provides valuable insights that can inform future research and practice. Our study indicates that the participants generally sensed coherence between what they learned in teacher education on

campus and what they needed in terms of competence as professional practitioners regarding facilitating oral participation and production in the L3 classroom. Sensing coherence in teacher education is about perceptions of the educational content as comprehensible and meaningful, and the professional demands as manageable. The findings indicate that the teachers largely understood the importance of facilitating students' oral activity in the classroom and that a safe learning environment is important for students to dare to be verbally active. This means that they might recognize their experience of teacher education as comprehensible. The findings from the interviews leave us with the impression that the newly educated teachers perceived our programme as meaningful, since the newly educated teachers largely found what they learned about this topic in their education to be useful for the planning and implementation of their teaching.

Furthermore, the observations showed that the newly educated teachers largely applied what is emphasised in teacher education regarding facilitating students' oral participation. This might indicate that they perceived their role as manageable, although we indicated how their moves towards promoting the oral element in the classroom could be improved. On the one hand, this may call for more practical examples during the seminars as well as for strengthening their understanding of the theoretical knowledge. On the other hand, this could also mean that their practice periods in schools, where they are supposed to train on how to teach and specifically address the challenges related to facilitating oral production, still remain a *black box* about which we have limited knowledge. Our study, therefore, highlights the importance of studies that go into depth on the learning opportunities provided during practical periods in schools, as well as at the university.

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9 Perceptions of Coherence among Teacher Education Students and Newly Qualified Teachers of Foreign Languages. An Exploratory Norwegian-German Study

Gerard Doetjes and Katja Zaki

Abstract

Recent studies on coherence in teacher education draw attention to a process- and actors-oriented approach, considering not only the supply-side, i.e. questions of structural or curricular programs of teacher education institutions, but also the reception of these offers by teacher education students. Against this background, the following contribution covers an exploratory interview study among teacher students and newly qualified teachers (NQTs) of foreign languages in Norway and Germany that who were asked asked about their teacher education programs. The chapter starts with a sketch of the theoretical foundations, followed by an outline of the chosen methodology—a qualitative approach with semi-structured interviews in a transnational setting – and a discussion of selected findings. In this context, a comparison is made between different cohorts and locations of education in order to shed light on the importance of curricular differences and to deduce questions for further research.

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Foreign language teacher education • Coherence orientation • Supply- and reception-oriented models • Sense of coherence • Student teachers • Newly qualified teachers (NQTs)

9.1 Introduction

In order to develop professional competencies which can be called upon and used effective in diverse classroom settings, prospective foreign language teachers must be able to connect subject-specific (i.e. linguistic, literary, cultural, linguistic-practical), subject-didactic and educational professional knowledge (Gruber, Mandl & Renkl, 2000). In many teacher education programs, however, there are hardly any learning opportunities that specifically promote the development of integrated knowledge structures or coherent study experiences through a targeted orchestration of different study contents (Darling-Hammond, 2006). Instead, they are often characterized by a fragmentation into phases, domains, and institutions (ibid).

Accordingly, measures that aim to improve the envisaged coherence of study programs and theory-practice links at the curricular level (*program coherence*) are essential for the effectiveness of teacher education (e.g. Canrinus et al., 2015) and are therefore being supported by national as well as international funding programs. The creation of coherence is, however, not only dependent on new curricular and conceptional offers on the "supply-side", but also on their reception and perception by students with their individual professional biographies and learning varibales (perceived coherence).

Thus, even if curricula are designed (or intended) by universities to be profession- and coherence-oriented, this does not automatically mean that the corresponding programmes are implemented and realised in such a way that they are perceived as meaningful and coherent by (all) students (ibid).

Against this background, the following article explores students' and newly qualified teachers' (NQTs) views on their teacher education programs, trying to outline general tendencies as well as possible contextual differences and factors in a comparative study conducted in Oslo/Norway and Freiburg/Germany.

9.2 Theoretical Foundations

9.2.1 Dimensions and Connotations of Coherence

When thinking of the term "coherence", philologists who work in foreign language teacher education in teacher education might not immediately think of a design principle of study programs, but possibly of structural aspects of texts or the local and global formation of coherence on the part of the readers. The use of the term for the description of structural or institutional, curricular or conceptual features of study programs is first found in the middle of the twentieth century in Anglo-Saxon curricula research (actually showing analogies to the above-mentioned linguistic concept of coherence but with a different disciplinary perspective and interest in knowledge); as a concept of curriculum studies, it was, however, neither primarily nor exclusively applied to teacher education, but also for disciplines such as law or medical studies (cf. Hammerness, 2006; Buchman & Floden, 1991).

Subsequent approaches of coherence orientation and attempts of refining the definition emphasized in particular structural, conceptual and personal measures of higher education institutions, which aim at an interconnection of study parts, at patching up fragmentations and discontinuities. If we look at teacher education as a complex interdependent system of structures, processes, and actors, we can further distinguish between different dimensions and understandings of coherence orientation and generation.

9.2.2 Program Coherence versus Perceptions of Coherence?

Regarding coherence-oriented arrangements for linking study components and domains of professional knowledge (such as content knowledge/CK, pedagogical content knowledge/PCK and pedagogical knowledge/PK; cf. Shulman, 1987) or theory and practice, a distinction can be made between more supply-oriented and more reception-oriented considerations. Often, coherence in teacher education focuses on the description of the first, with curricular, structural forms of coherence in the foreground. Yet, even if curricula and study programmes are designed (or intended) by universities to be profession- and coherence-oriented, this does not mean that the corresponding programmes are implemented and realised in such a way that they are also automatically perceived by as meaningful and coherent by individual (cohorts of) students (Canrinus et al., 2015).

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Accordingly, recent studies define coherence as a co-constructive process (Hammerness, 2006; Nordine et al., 2021) and emphasize actor-based approaches that consider the role(s) of the actors involved as well as the effects on contextual factors and recipients with their individual variables. As integrative supply-use models (Joos et al., 2019; Helmke, 2007) suggest, teacher education should thus be understood as a complex interdependent system of structures, processes and actors that influence the effective use of educational resources. In this context, the significance extends beyond merely the institutional and structural aspects (e.g. curricula). Equally crucial is the way different stakeholders interact and how offers and processes are received by students: "Although teacher educators may perceive their program and courses to be coherent, the question remains to what extent student teachers are also able to perceive the linkages within their programs" (Canrinus et al., 2017). In this context, salutogenetic models of coherence perception, such as the one developed by Antonovsky (1997), seem to be of particular relevance since they address holistic approaches and conceptions of the coherence and focus on the perspective of students' and their study experiences as a whole. Accordingly, in addition to the cognitive level of comprehensibility, it also includes aspects of individually perceived meaningfulness and manageability (Antonovsky, 1997).

9.3 Foreign Language Teacher Education in Germany and Norway

As different as the connotations of coherence orientation may be, they did not arise independently, but are framed by historical, cultural, educational-political as well as subject-specific framings. Diverging conceptions and models of teacher education in Germany and Norway, for example, can hardly be understood without a look at their historical genesis and ecological contexts.

9.3.1 Teacher Education in Germany

Despite regional differences due to the federal organization, the basic structure of foreign language teacher education in Germany is characterized by a consecutive structure of university-based education (bachelor and master or state exam, depending on the region) and a school-based induction phase (18 to 24 months until the final teaching qualification).

Traditionally, the first university-based phase has a high proportion of subject-related studies. For all school languages that can be studied, for example, philological subdisciplines (linguistics, literary studies, and cultural studies) account for approximately 60 to 70% of the study for secondary education (Legutke et al., 2022, p. 18). This is not only due to the repeated emphasis on the importance of subject knowledge for pedagogical content knowledge (Voss, 2021), but also due to the historical genesis of a diversified school system and teacher education system from the nineteenth century onward. Not until the 1960s and 1970s did paradigm shifts increase the importance of educational science components, research-oriented didactics as well as profession-oriented language practice.

Triggered by the Bologna reform and the post-PISA shock of the 2000s, publicly funded programs such as the Quality Offensive Teacher Education have consequently enhanced structural and/or conceptual reform processes nationwide. In Baden-Württemberg, for example, the state government replaced the traditional teacher training program with a first state examination by a combination of a polyvalent Bachelor of Arts or Science and a Master of Education (RahmenVO-KM, 2015). Due to the challenge of structural reorganization, the changeover also offered the opportunity to redesign and align existing models, module structures, and teaching concepts (Table 1).

In Freiburg, the curricular reforms were accompanied by changes in organizational structures, institutional responsibilities, and curricular designs. Since then, the foreign language teacher education program for upper secondary schools is

Table 1 Study components and ECTS in the reformed BA/MA programs for secondary education at the University of Freiburg and the University of Education, Freiburg.

	University of Freiburg		University of Education Freiburg	
	BA/B.Sc	M.Ed	BA/B.Sc	M.Ed
CK, subject 1	75	17	61	6
CK, subject 2	75	17	61	6
PCK, subject 1	5	10	5	18
PCK, subject 1	5	10	5	18
PK	4	35	27	33
School practice	6	16	3	24
Thesis/other	10	15	18	15
Total	**180**	**120**	**180**	**120**

organized in a consecutive program of a subject-centered bachelor's degree and a profession-oriented Master of Education with a stress on educational and didactical courses as well as an integrated semester of practical studies in schools (see Reiser & Zaki in this volume for more detailed information).

9.3.2 Teacher Education in Norway

In Norway, universities and university colleges can offer four types of teacher education programs for primary and secondary school: five-year master programs for Grade 1–7, Grade 5–10 and Grade 8–13 and a one-year post-master program for Grade 5–13. However, until recently, teacher education for Grade 1–7 and 5–10 were bachelor programs and the one-year program required a bachelor, not a master. At this time, it is not possible yet to say how this reform has affected schools and teaching, but in light of a significant drop in student numbers across all programs in 2023, a revision of the reform might be necessary. The number of school subjects, the main goals and the minimum number of ECTS for CK, PCK and PK are defined by law, but universities and university colleges have a degree of freedom to define their own teacher education concept within legal limitations. There is no formal qualification after the bachelor phase of the program and there is no further qualification needed after students leave the program; i.e. there is no school-based induction phase. However, municipalities are encouraged to have a mentoring program in place for first-time teachers.

Below, we show the composition of the five-year master program at the University of Oslo. Main characteristics of the program are: a) Students become teachers of two subjects. All CK courses for the minor subject are completed in year 1; the major subject, being the master subject, extends from year 2 until year 5, e.g. students can have English as their minor and German as their major. b) Students participate in three combined PK/PCK courses in year 2, 3 and 4. The PCK part of these courses is split between both subjects. PCK courses for German are normally combined with French and Spanish, but some exemptions are made to provide students with the opportunity to work on (and in) German separately. c) Students have a total of 100 days of school practice in year 2 until 5, always organized as mid-semester practice phases. Practice covers both subjects (Table 2).

Table 2 Study components and ECTS in the five-year MA teacher education program at the University of Oslo.

	BA phase, University of Oslo	MA phase, University of Oslo
CK, subject 1	80	60
CK, subject 2	60	–
PCK, subject 1	7.5	7.5
PCK, subject 2	7.5	7.5
PK	15	15
School practice	40 days	60 days
Thesis/other	10	30
Total ECTS	**180**	**120**

9.4 Explorative Interview Study

With the objective of examining students' general perceptions of coherence in their study programs, questionnaire surveys were conducted at the partner institutions of the ConnEctED consortium (cf. Mikkilä-Erdmann et al., Domovic et al. in this volume). To obtain further insights into selected elements of individual perceptions and their lines of thought, among the student populations as well as among NQTs, an explorative interview study was conducted for and in the German und Norwegian context. Building on the theoretical foundations of a polyfactorial concept of coherence outlined above and taking into account the global inferences from the questionnaire data, the decision was made to use semi-structured group interviews in a transnational setting. For this purpose, a semi-structured interview guide was developed and piloted, based on the above-mentioned salutogenetic coherence construct (Antonovsky, 1997).

9.4.1 Sample

The interviews were carried out in four focus groups: German students of Spanish (Ge-St; N = 4), Norwegian students of German (No-St; N = 3), German NQTs teaching Spanish (Ge-NQT; N = 4) and Norwegian NQTs teaching German or Spanish (No-NQT; N = 3). In total, 14 participants were interviewed. The interviews were conducted in German, except the mixed Norwegian NQT groups, where English was used.

9.4.2 Instrument: Structure, Piloting and Implementation

The semi-structured interview guideline was developed based on earlier studies on coherence in pre-service teacher education (Joos et al., 2019; Faltermaier & Dietrich, 2017; Felbinger, 2010; Darling-Hammond, 2006). Accordingly, the guideline consisted of three main blocks, each covering a thematic unit:

- (Warm-up)
- Coherence in the sense of **comprehensibility** and interconnectedness of the teacher education program
- Coherence in the sense of **meaningfulness**
- Coherence in the sense of **manageability** and well-being
- (Closing remarks)

The core interest of the study was to find out whether and to what extent students and graduates (Newly Qualified Teachers/NQTs) experienced their teacher training programme at the locations under consideration as meaningful and coherent (in the case of trainee teachers looking back on their studies). This implied a discussion of the following aspects: connections between courses in terms of content, the comprehensibility of the study program and the imparting of profession-oriented knowledge and skills. For NQTs, the perceived significance of their studies for their current practice and feelings of self-efficacy also come into play. Since four different focus groups were to be interviewed: teacher students and NQTs both in Norway and in Germany, the interview guide consisted of a common core as well as differentiating elements. The interview guide was piloted with a group of students from both Germany and Norway and adapted accordingly.

9.4.3 Exploratory Results

For the analysis of the material, a combination of a summarizing and a structuring content analysis according to Mayring (2015) was applied, whereby the coding guide was significantly oriented to the categories of the underlying coherence understanding and the developed interview guide. To verify and refine the coding and to detect possible inconsistencies with the material as well as to guarantee for an interrater reliability, the entire process was carried out by two researchers. Finally, the interview data of the four group interviews were processed. For the purpose of the present chapter, which examines the student view of coherence

experience from two perspectives, i.e. between German and Norwegian students and between teachers and NQTs, selected results are subsequently presented in an explorative manner.[1]

9.4.3.1 Sense of Coherence Among Master of Education Students

Norway/Oslo

Analyzing the interview data of the Norwegian student group—all enrolled in the five-year teacher education program at the University of Oslo with German as one of their subjects—it became clear that the aspects of coherence of the salutogenetic model, comprehensibility, manageability, and meaningfulness, are to be seen as interdependent, and at times as competing.

As far as the ***comprehensibility*** and ***interconnectedness*** of the study program is concerned, the participants generally perceived a logical and reasonable conception underlying their studies ("You can see a slight common thread", No-St2), but also mentioned discrepancies between the intended, implemented and achieved curricular aspects as well as concerning the coherence of the different domains. A student studying German and history, for example, stressed that certain offers that were able to highlight structural or conceptional connections between subject sciences and didactics and/or theory and practice were only selectively available—such as courses in subject sciences offered for teacher education students only, co-taught or coordinated courses by university lecturers and teachers/mentors from schools: "For example, there were professors who gave lectures and then there were seminars with teachers from the school accompanying them." (No-St1)

Concerning the manageability criterion, both referring to the ***manageability*** of the study program as well as to the (expected) manageability of the future profession through their study program, several statements stress factors of support and appreciation through the institution and staff. In this context, it was highlighted that the organization would often not take into account extracurricular life aspects of the students (the need to work, health issues) and sometimes even build new obstacles (e.g. not facilitating stays abroad). Generally, however, the students felt well integrated and supported by faculty and their peers, and they considered the social integration as one key factor to feeling secure and self-assured about their program.

[1] All cited German interview passages were translated into English. Possibly disappearing nuances were accepted for the sake of general comprehensibility and reader-friendliness.

While levels of comprehensibility and manageability of the study program were rather high, the **meaningfulness** of the study program was seen as having room for improvement, especially concerning the conception of university courses of the program. The practical elements of the program as well as their interlocking with the university studies were seen as very beneficial. Among the university courses, subject didactics were seen as the most meaningful:

> So I think the subject didactics is the most relevant for us, so it's about summarizing and selecting everything we know about the subject and, that's the most important thing for us, to be able to pass it on to the students and also how, so in what order, what makes sense, so this whole overview […]. (No-St2)

Even those seminars, however, were perceived to be too theoretical and too little linked to practice:

> One criticism is actually only that in the seminars, because the subject didactics was in the seminars, it was very theoretical somehow. I mean, the theory should be there, but [...] being a teacher is somehow a halfway craft, you have to apply it somehow. I don't mean that you should get a recipe, that it always works like that, but just that you learn a bit more practically. (No-St2)

The focus group agreed on that point and added that the strong theoretical focus and little practical relevance was even stronger in other domains, i.e. in educational sciences and subject sciences; an exception were selective courses in linguistics and literature (phonetics, literature of the twentieth century, such as post-war "Trümmer-Literatur") as well as, in particular, language practice, such as courses in grammar:

> So we have this grammar subject, which was absolutely 100% relevant, because the level is not that high at school. And this grammar subject is the one that we use the most, I think, in any case. (No-St1)

Generally speaking, the selection of profession-relevant topics as well as methodology and concrete references to the school context were described as too dependent on the choice of courses by students and/or by the teaching styles of individual lecturers. One of the students, however, stressed the importance of the subject sciences from another point of view. Even if they had no concrete reference to the subject matter, they would still be able to give him more background knowledge and thus security and authority for teaching (and, in particular, giving explanations):

> I found that it [the subject-related study part] is not so relevant directly for being a teacher. But it is important, I think, just for general education as a teacher. And if you know these things, then you are better able to explain things. (No-St-3)

Suggestions that were made in the end of the interviews included a stronger modelling of practical situations through simulations or role plays, the selection of topics of practical relevance, good guidance and mentoring arrangements.

Germany/Freiburg

When discussing aspects of **comprehensibility** and **interconnectedness** of the program, German students underlined—just as their Norwegian fellow students—that they perceived a general conceptual consistency of their studies, although the latter were only partially aligned with the teaching profession. Concerning the individual study components, many CK-courses (i.e. language, literature and culture courses) of the bachelor phase, for example, were reported to be joint by non-teacher education students and, accordingly, not profession-oriented at all. Language courses seemed to have the most graspable relevance as well as a recognizable internal progression in this context, opposite to literature courses, which were perceived as less connected and of rather little relevance (cf. Ge-St3). The Master of Education program was conceived as more integrative and more profession-oriented.

In general, students seem to be rather happy with their choice of studies and see a general ***meaningfulness*** despite of several points of criticism—not only because of the program itself, however, but also because of complementary biographical aspects. As far as the teacher education program is concerned, the practical phases are seen as most motivating and most "eye-opening" (cf. Ge-St2), while the meaningfulness of educational sciences and didactics courses seem to depend on the concrete focus. Courses focusing on inclusion aspects, for example, are surprisingly perceived as little relevant by some of the German students interviewed, because "the further you get in school system, the less inclusion" (Ge-St1), i.e. the division of students in the German school system seems to have an influence on students' perception of the need of insights in inclusion.

To an even higher extent than the Norwegian students, the German student group considered CK (literature, culture and linguistics courses) as only partially relevant for school practice itself but valued it as an important foundation that might strengthen their personal horizon and authority (Ge-St3). They seemed to appreciate a thorough understanding of the foundations of the subject and differentiated between their knowledge and content of the school subject.

More than the Norwegian group, German students highlighted the connections between their studies and their *personal interests and experiences*. For instance, one student (Ge-St1) mentioned that while working at a volunteer job, he discovered that he likes to work with people and is good at knowledge transfer. Another student (Ge-St2) added that she enjoyed being a coach for young people. In a similar way, they stressed the importance of having *mentors* themselves and of knowing staff that they could ask for help for teacher education related questions. Additionally, concerning biographical factors, their own language/personal biography were stressed as influential as well individual hobbies, attitudes, and part-time activities in general. One student (Ge-St1) stressed the fact of having been socialized in a "family of teachers" and describes teaching as a "meaningful activity" because of its relevance for society.

As far as ***manageability*** is concerned, German students seemed to appreciate PK courses ("super exciting"/Ge-St1, "somehow interesting"/Ge-St2), but they also pointed out the heavy workload, courses being mainly concentrated in the master phase of their studies. Some students described PK courses as "boring and lengthy", with one student saying that she lacked motivation and that she experienced a feeling of being overwhelmed before exams (Ge-St2).

The semester with twelve weeks of integrated school practice at the end of the studies is perceived as very valuable and motivating by the students, although it implied a heavy workload ("mega, mega much"/Ge-St4). It did often not appear to be congruent or even connected with the theoretical concepts ("all that theory"/Ge-St4)) of their study program. Generally, students reported that the fact that they had so few practical elements during their studies made them feel "anxious" (Ge-St2 and Ge-St4)—on the one hand, they felt that there should have already been more practical elements in the bachelor phase as preparation for the master and the induction phase.

Concerning the manageability with regards to the future profession, most German students did not yet feel prepared—partly because of a lack of practice and partly because of their competence levels in the foreign language. As far as the limited amount of school practice and practice-related courses are concerned, students did not only address the mere amount, but also a "too narrow scope" (Ge-St1/Ge-St2). They argued, for example, that their studies concentrated too much on the role of teachers as instructors and that they would also like to learn more about other aspects of teachers' work, i.e. administrative task and school management.

One student (GeSt-1) pointed out they will be needing to continue to work on their language skills, as the program contained very few language courses. Students also mentioned a lack of structured courses in cultural studies and cultural

aspects, which they stated weren't prioritized in the study program. Some students reported they compensated these shortages by coming from Spanish speaking countries themselves or by staying abroad during their studies.

9.4.3.2 Sense of Coherence Among NQTs

Norway/Oslo

Unlike the students' group, the NQTs looked back on their teaching program with some distance, which impacted all three of the aspects focused on in the present study. Furthermore, to a greater extent than among the students' group, the assessment of the teaching program among graduates seemed to depend highly on their current personal situation and satisfaction with the teaching profession. Consequently, the evaluation of the comprehensibility and meaningfulness of the studies, was strongly related to the estimated manageability of the current profession. On the one hand, this is hardly surprising, as retrospectives are generally marked by and coherent and with the present experiences. On the other hand, the extent of the respective influences was not expected when the study was planned.

Regarding ***comprehensibility*** *and* ***interconnectedness***, it became clear that the boundaries between individual domains and parts of one's own studies seemed to blur retrospectively, and, for example, in some cases a clear distinction was no longer made between subject-specific didactics and educational sciences.

Retrospectively, the group saw the potential to increase the **meaningfulness** of their former study program by focusing stronger on school relevant topics, not only concerning the subject matter (i.e. choosing school relevant topics in literature or linguistic courses) but also the integration of content and courses that address other fields and challenges of the teaching profession. Concerning the focus of their university courses, some reported rather disillusioned on what they had learnt—be it on the use of the foreign language in class, which does not seem to work in practice, or also on the relevance or non-relevance of specific topics:

> I think it's not only that there was no didactics in the kind of science subject, but a lot of the subjects were also extremely irrelevant, especially in the master's degree. Like there's no way I can ever use that knowledge in class. For example, I have 20 study points in „Das Nibelungenlied". So I can read middle-aged German. I know about middle-aged culture and I'm never going to mention that in front of the students. So I feel like I had to gain a lot of knowledge that is completely useless in my work as a teacher. (No-NQT-2)

Besides that, several participants mentioned improving preparation for working with parents, administrative issues and school management.

Concerning the ***manageability*** aspect, the group emphasized high levels of stress during their studies, which were not always related to the work load itself, but also to a perceived lack of personal assistance and guidance on some occasions (e.g. when not being able to stick to the planned schedule for personal reasons, or when planning a semester abroad). Generally, supportive structures such as trustful counsellors and the opportunity to take part in mentoring programs were mentioned as positive. Such offers ensured that the stress experienced by students could be reduced. Further, the existence of a stable peer group was mentioned as an assuring factor.

As far as the manageability of professional challenges is concerned, the general impression was very different. While one NQT reported that "the jump into the cold water" was a difficult but a manageable learning experience, another expressed high levels of frustrations and doubt:

> And it was so obvious when I started working that what I learned at university was of such little use. Also, what I learned in pedagogy and what I really needed, I had not learned at university. Survival strategies is a big thing. I barely got through the first year and I would consider myself at risk to drop out from teacher job right now because a lot is like, okay, I know the ideal, I know how an ideal lesson should look like and I just don't manage. (No-NQT-3).

In the end, all participants suggested that teacher education should invest in the emotional stability and integration of its students, "listen more to the voices in schools" (No-NQT-2), and at the same time deepen, concentrate, and expand the offers of profession-oriented topics and areas, such as non-violent communication or school management.

Germany/Freiburg

The German NQTs look back on their studies is also generally marked by the perception of a recurrent theme—which is, however, surprisingly connected to their current experiences. Concerning the ***comprehensibility*** *and* ***interconnectedness*** of the former study program itself, they reported on similar issues as the German students: They saw a clear split between the bachelor phase on the one hand, which was dominated by subject sciences whose relevance they could not always identify (an exception here, once again, was the language practice; furthermore, linguistics courses were perceived as more coherent than literary studies and the latter more so than the offer of cultural studies courses, which seemed to be the least vertically coherent and interconnected), and the master phase on

the other. Only in the Master of Education did they recognize a strong stress on profession-oriented courses—as well as interconnections between different domains.

When asked about links between different fields of their studies, for example, they referred in positive terms to a course combining CK and PCK in an integrated master seminar (about "memoria histórica, cultures of remembrance"), a PK course where they were asked to video-tape a short teaching session on core practice in their subjects, as well as a profession-oriented language practice course offered by a lecturer with school background:

> I actually thought that was pretty good, that sometimes teachers from the field offered courses. They even offered materials and gave examples of lessons. (Ge-NQT-2).

As a consequence of the perceived division, they did not experience their study program as a *continuous* professional development of their professional (e.g. educational, didactical, methodological) competences, but rather as a sequence of distinct phases with distinctive functions. Yet, somewhat surprisingly, they attribute different categories and aspects of relevance and benefit to each of the latter and evaluate their entire study program as very meaningful. Interestingly, the induction phase seems to come into play here—as the experiences of this school-based phase after their studies (which is needed to gain a full teaching qualification) was retrospectively seen as a sort of missing link, being not only very praxis-oriented and motivating in and of itself, but also attributing retrospective sense and meaningfulness to the phases before it.

An additional aspect that several NQTs mentioned, like their fellow students' group, was the relevance of commitments outside their studies and induction phase (such as working as a swimming coach or a tutor) for experiencing meaningfulness and self-efficacy ("It's nice to feel how you can transmit something to people"/Ge-NQT2). One participant also explained that very early biographical experiences as well as her memories of her own teachers influenced her in that regard.

Once more, the statements revealed an interdependence of different aspects of coherence, also between the perceived meaningfulness and the manageability (of studies and the future profession). In general, the German NQTs recognized that a five-year program can't completely prepare them for the job—retrospectively almost "defending" their study program and its shortfalls which they identified. In addition to the function of the induction phase, they unanimously stressed the importance of self-discipline, engagement, and the reflection on the individual strengths as important elements:

> And yes, in the end, I think enthusiasm and motivation for one's own subject are important, perhaps also experience in the foreign country, so that one can really convey the culture. Of course, you can never do that 100 percent, but I think it makes a big difference if you teach something and have lived in the culture yourself, experienced how the language is used, what traditions are like, and so on. (Ge-NQT3)

When asked for suggestions, NQTs expressed a high satisfaction with their professional development altogether. Concerning the university-based studies, they wished that they had had more opportunities to connect theory and practice. In this context, they suggested that courses should be more centered around school related topics (such as background knowledge) and that there should be more and better-connected practical phases.

9.4.4 Discussion

The aspects and nuances of perceptions of coherence that emerged in the interviews show traces and influences of different factors: by the respective teacher education system and related national/regional educational cultures, by personal positions and roles in the system as well as by professional and language biographical variables. And surprisingly, it is precisely the latter that also points to decisive differences and conditional factors, which under similar conditions lead to differences in experienced meaning, significance, or even general satisfaction.

Essentially, we see that in all groups both systematic factors and various misconceptions regarding the domains involved lead to latent dissatisfaction and to some lack of understanding of the teacher education programs. The boundaries concerning what actually belongs to subject science and why, and the dividing lines between educational science and subject didactics were often fluid. Regarding the continuity and vertical coherence of the individual areas, differences were observed that, on the one hand, were unanimously put forward (a naturally comprehensible progression and inner coherence in language practice courses, as far as they existed), but, on the other hand, depended strongly on one's own study experience and on the courses chosen. This point was put forward by both the German and the Norwegian groups, whereby the freedom of choice of the students in Oslo also referred to entire intradisciplinary sub-areas, i.e. to take language and culture or literature, for example.

Desiderata which were brought forward by all groups were stronger interconnections (and their verbalization) of individual study domains and phases, and, above all, corresponding contents specific to and relevant for teaching, which

include references regarding its significance for the profession. Also, students expressed a wish for a stronger connection between theory and practice.

Interestingly, the German NQTs, who had to complete an 18-month induction between their university studies and their full qualification as teachers, had a more positive retrospective view of their studies than the Norwegian students, who began teaching immediately after graduating. The induction phase seemed to act as a complementary sense-maker to the studies. The recollection of their own studies, by nature always selective and marked by the perception of their present situation, therefore seemed to be more positively colored by the second phase and to result in a general satisfaction with the overall picture. Due to the explorative character of the study, it is not possible to derive any generalizations in this regard, but it is nevertheless desirable to investigate this further and to give greater consideration to the group of graduates and their reconstructive view of coherence in teacher training (or in relation to their professional biographical process in general), which has hardly been taken into account in recent coherence research.

Similar observations can be made regarding meaningfulness and manageability. Here too, the national differences seem comparatively small despite the different systems. In general, the perceived significance during the studies, which was attributed to the study program itself, was somewhat higher among the Norwegian students—which was attributed to, among other things, the practical components as well as mentoring offers—but was overall comparable to that of the German student group, whereby in the latter, the relevance of personal factors was also emphasized in particular (experiences as tutors, soccer coaches, etc.).

Regarding manageability, it seems necessary to differentiate between the assessment of the ability to cope with the study program itself and the ability to cope with the professional challenges as a teacher due to the study program. With regard to the ability to cope with the study program, the response dynamics of German and Norwegian students differed with regard to the focus: While Freiburg students referred more to the high workload including many exams and thus concentrated on the workload itself, the students from Oslo emphasized the importance of circumstantial factors such as the atmosphere, the appreciation and the personal support and advice at their institute, which all influenced their personal levels of resilience. Due to the exploratory nature of the study, no sweeping tendency can be derived. However, institutional and contextual factors of teacher education cultures should be considered in subsequent studies.

As far as the ability to cope with the professional demands of a foreign language teacher is concerned, the basic tendency of the graduates on both sides

differed. On the German side, this seemed to be particularly due to the complementary factor of the traineeship, which made the overall system retrospectively appear meaningful and coherent.

Independently of this, however, both groups mentioned the desire to already be broadly prepared for the various challenges of the teaching profession during their studies. According to them, the focus should not only be on the role of the teacher in the classroom, but also on related areas of dealing with parents, school management, etc. Some voices also suggested that the manageability should be increased by changing the conditions at the schools themselves and drew on examples from other contexts such as France; however, since this was not the focus of the study, the related statements are not covered here.

To conclude, the need for a more integrative view on coherence and profession-orientation was expressed and emphasized across all focus groups. We need to see teacher education students not only as students, but rather as holistic personalities with different language biographies, cultural backgrounds, and other individual learning variables. In addition, there is a need for a more interconnected transmission of core competences of the teaching profession itself as well as related areas, such as educational management, parental work etc.

9.5 Conclusion

Whereas research on coherence in teacher education often places aspects of intended and implemented program coherence at the center of the analysis, the present article shifted the focus to the sense of coherence among the addressees of teacher education programs, i.e. teacher education students and graduates (newly qualified teachers).

Through semi-structured group interviews in Norway (Oslo) and Germany (Freiburg), the aim of the exploratory study was to ascertain how reformed teacher education programs in both countries are perceived by those who have either recently completed them or are currently taking part of them. Against this backdrop, the focus of interest was on the respective perception of coherence by members of the different focus groups, operationalized through the constructs comprehensibility, manageability, and meaningfulness as central factors of a salutogenetic model of coherence.

Generally speaking, the study illustrated once more how teacher education in general, and the drive towards greater coherence in particular, is to be viewed as a polyfactorial system, the functioning and impact of which depend on the interaction of a wide variety of factors and actors: Just as important as systemic

and curricular aspects that shape study programs is their concrete implementation as well as the perception and narrative construction of the latter within heterogeneous groups of individuals with their different profiles, paths and professional biographies. With regard to future research, whether regionally focused or comparative, longitudinal studies which track perceptions of coherence over a longer period of time, also after graduation and into professional life, could be purposeful and promising in order to further investigate long-term effects, dynamics and context-sensitivities. In this respect, qualitative studies in particular could contribute to shed more light on personal positionings and narrative constructions as influencing factors for perceptions of coherence, be it within or across the various phases of (future) teachers' professional biographical stages.

As the exploratory content analysis of the data indicates, a number of hypotheses and subsequent research questions can be derived, as well as practical requirements for the further development of teacher education programs.

Principally, the voices of students and graduates can be read as a plea for a personalized or more holistic, personalized and individualizable teacher education. As seen, besides the systemic factors, it is especially teacher students' language and professional biographies as well as individual learner variables in general that strongly influence the experience of coherence. Both the flexibility of the programs through elective and other differentiation options and the personal counseling and support of students through mentoring offers, peer groups, and academic advisors appear essential here.

Future research could, for example, focus on the importance of individual variables of teacher education students (of foreign languages) as well as systematic supportive structures such as mentoring programs and induction phases that seem to have a considerable influence on how student teachers and newly qualified teachers perceive their education.

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Research-based Teacher Education Curriculum Supporting Student Teacher Learning

10

Auli Toom and Jukka Husu

Abstract

Coherent research-based teacher education curriculum is of vital importance when educating student teachers for the teaching profession in the academic university context. It is essential that the characteristics and complexities of teachers' work are comprehensively taken into account in the curriculum. At the same time, the curriculum needs to prepare student teachers to learn an inquiring orientation towards teachers' work. It is essential that student teacher learning is at the core of teacher education programmes. This means that teacher education should have a clear research-based profile and organising theme, and that its curriculum should be coherent. In addition, pedagogical practices utilised in teacher education need to allow student teacher learning, collaboration with their peer students, active professional agency in a variety of ways, and allow for learning pertaining to taking care of their well-being. Teachers are in a key position in orchestrating pupils' learning in their own classrooms, as well as in supporting their peer teachers' learning, promoting pedagogical innovations, and developing schools. Pre-service teacher education should equip student teachers with strong professional agency, which

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allows them to learn continuously in the profession, support pupils and colleagues, as well as act professionally in continuously changing educational contexts.

Keywords

University education • Teacher education • Research-based curriculum • Curriculum coherence • Teacher education pedagogy • Student teacher learning

10.1 Introduction

In this chapter, we outline the importance of a coherent and constructively aligned (cf. Biggs, 1996; Floden et al., 2021) research-based curriculum for supporting student teacher learning for the teacher profession. We begin by elaborating the characteristics of teachers' work and the key capabilities based on current research. We then turn to the complexity of student teacher learning of these capabilities as well as the role of teacher education pedagogies in it. Our second aim is to discuss the wholeness of research-based and coherent teacher education curricula. The third aim is to suggest future considerations for supporting teacher learning, which includes the time in the profession after the pre-service education.

Researchers on teachers, teaching and teacher education have identified the characteristics of teachers' work and the essential capabilities needed in the teacher profession, for example, related to learning and teaching: well-being, interaction, and school development (Clandinin & Husu, 2017; Husu & Toom, 2016; Lampert, 1998; Toom, 2017). The research has defined core capabilities necessary in teacher's work but also identified current needs of the profession. More emphasis needs to be placed on teachers' capabilities in supporting the well-being of pupils, acting in the diverse and changing contexts, as well as continuous learning in the profession (Toom & Husu, 2022).

Earlier research has discussed some of the complexity of teachers' learning of these essential capabilities (van Eekelen et al., 2006; Bronkhorst et al., 2014; Heikonen et al., 2020). Earlier research has also emphasised the importance of high-quality teacher education and pedagogies when cultivating student teacher learning and supporting their development in the profession (Clandinin & Husu, 2017; Cochran-Smith et al., 2015; Toom et al., 2010). In addition, these have been continuously emphasised in educational policy papers, reports, and agendas related to teachers, schools, and pupils' learning (e.g. TALIS, 2018; Unesco, 2021). The discussion about teachers' capabilities arises because teachers have

a central role in enhancing pupils' learning as well as the developments and innovations of the educational system. Teachers are also in a key position with regard to enacting a school's educational task and their role in society (Juvonen & Toom, 2023).

While there is a consensus on the importance of supporting student teacher learning of key capabilities for teachers' work and the important role of high-quality teacher education programmes related to this, a crystal clear understanding of the essential and necessary characteristics of teacher education curricula does not exist (cf. Husu & Toom, 2016). While several principles, practices, and even empirical evidence can be found (e.g. Cochran-Smith et al., 2015; Toom et al., 2010), the earlier literature says surprisingly little about the importance of research-based characteristics and coherence of teacher education programmes in terms of student teacher learning (Grossman, 2007; Kansanen, 1991; Kansanen et al., 2000). The challenge in teacher education programmes is especially related to coherently supporting student teachers' learning to become teachers and doing it both collectively and individually throughout their studies in teacher education (Floden & Buchmann, 1993; Grossman, 2007). Furthermore, surprisingly little research exists on the relationship between student teacher learning and learning environments in teacher education, as well as how various components of the learning environment contribute to student teachers' learning (Heikonen et al., 2020; Soini et al., 2015; Toom et al., 2017). Learning key capabilities for teachers' work requires a variety of meaningful theoretical studies and activities, practical studies and practice related to teaching, versatile support, as well as continuous reflection and feedback.

10.2 Complexity of Teachers' Work

Teachers' work is highly complex, demanding academic and practical work (Lampert, 1998; Toom, 2017), which is not always considered as such due to its practicality as well as familiarity to everyone through their own personal school experiences and *apprenticeship of observation* (cf. Lortie, 1975). Teachers do their work in versatile interactions, social surroundings, and communities. The teacher profession is demanding in the sense that it is anchored to a long-term planning of education, teaching and learning in school and classroom in line with the national curriculum. It also assumes a thorough preparation of lessons on the classroom level and anticipation of support for each pupils' learning and growth (van Manen, 1991). In the Finnish context, the aim is to support the growth of every pupil towards finding their own strengths and learning-paths as well as

towards responsible citizenship in a democratic society (Finnish National Core Curriculum for Basic Education, 2014). This all happens and coincides with the curriculum and with respectful regard of the families' and guardians' worldviews and education at home.

An important aspect regarding the demands of the teacher profession is that it assumes the ability to solve complex problems and make quick decisions in changing situations in the classroom and in school interactions, which need to be aligned with the long-term plans (Shavelson, 1973; Toom, 2017). Teachers always need to consider the contextual and situational as well as collective and individual aspects of their decisions, and ensure that pupils' learning in school is always supported. Teachers' work presupposes *pedagogical tact* (Toom, 2012; van Manen, 1991) in the interactions in the classroom with pupils and the school community with colleagues.

Societal changes significantly influence schools and teachers as well as the teacher profession (Juvonen & Toom, 2023). Society sets explicit and implicit demands and expectations on schools and teachers, which are also assumed to be fulfilled (Buchmann, 1986; Toom & Husu, 2018). Some of these are related to the core professional responsibilities, an ethical code, and integrity (Day, 2021; Tirri & Kuusisto, 2022), whereas others are related to more recent changes in schools, e.g. diverse pupil composition and pedagogical developments. Schools are becoming much more diverse in all aspects due to a globalised world, and teachers also need to be able to take care of the learning needs of pupils with diversities and intersectionalities (Madden, 2015; PIONEERED 2021–24).

Current research on learning and instruction highlights placing pupil learning at the core of all instruction. In addition, pupil learning of both subject-specific skills and generic skills are emphasised (Finnish National Core Curriculum for Basic Education, 2014). This means that teachers need to understand pupil learning processes thoroughly and have skills to facilitate it in a variety of pedagogical methods and practices. These are currently mainstream in basic education curricula internationally. All these aspects are realised in individual teachers' work in everyday practice in schools.

It can be clearly stated that the teacher profession is complex and demanding as well as being relatively independent (Day, 2021; Niemi et al., 2018). Teachers are regulated in the educational system through their responsibilities and duties, and how their role is defined in the curricula (Toom & Husu, 2018). Teachers work throughout continuous changes, uncertainties and incompleteness stemming from inside and outside the school.

10.3 Learning to Become a Teacher

These characteristics of teachers' work need to be taken seriously when planning and enacting teacher education curricula and when supporting teacher learning. According to earlier versatile research, learning to become a teacher is a complex and non-linear process which takes time (Bronkhorst et al., 2014; Heikonen et al., 2020). The process includes identity development (Beijaard & Meijer, 2017), the learning of professional agency and capabilities for teaching (e.g. Soini et al., 2015; Toom, 2017; Heikonen et al., 2020), and development towards adaptive and collective expertise, which was found as an important resource for teachers' work (Leana, 2011; Vangrieken et al., 2015). Also, moral aspects and their learning are of vital importance (Tirri & Husu, 2002; Toom et al., 2015), which need to be a part of teacher education.

The core of teachers' expertise has been shown to consist of professional capabilities 1) in learning and instruction, 2) in interaction, 3) in well-being, and 4) in school development (Soini et al., 2016). These professional capabilities are necessary in teachers' major professional contexts: in classroom interaction with pupils and in professional community with colleagues. Professional capabilities in learning and instruction means that teachers have extensive research-based knowledge and skills to support pupils' learning, but also the ability to take care of their own learning and support colleagues' learning. Professional capabilities in interaction means that teachers know how to construct functioning interactions among pupils, among colleagues, and with parents and enhance learning and development. Professional capabilities in well-being means that teachers realise that well-being is an essential precondition for both their pupils' learning, but also their own and colleagues' learning, and they can build such circumstances in the classroom and school. Professional capabilities in school development means that teachers know the key factors of school development and they have skills for launching pedagogical innovations and promoting school improvement.

Many theories, foundational studies, and empirical research also emphasise moral dimensions of teaching, professional ethics, and values as a pervasive factor in all teachers' work (Tirri & Kuusisto, 2022). This means that a teacher has a clear understanding of ethical aspects in the teaching profession, has clear ethical principles, is sensitive towards moral issues in teaching, and can act in dilemmatic situations. This allows teachers to take care of pupils' learning and support their growth towards responsible adulthood and citizenship.

Many researchers perceive teachers' professional capabilities as integrative and consisting of knowledge, skills, and dispositions to act (Blömeke et al., 2015; Toom, 2017). Toom and her colleagues (2021) also perceive professional agency

as a necessary capability for teachers to steer their own learning both in pre-service teacher education and afterwards in the profession. Professional agency for learning means that teachers need to become skilful learners during teacher education, i.e. they are willing to learn, they feel that they are able to learn, and they manage a variety of strategies to do so in practice (Pyhältö et al., 2015). Thus, it can be said that professional agency is a sort of "meta capability" which is necessary for teachers' work (Soini et al., 2015; Toom et al., 2017).

It is essential to identify teacher' necessary professional expertise and capabilities to be learnt during pre-service teacher education, but it is especially important that teachers are prepared to continue to learn and develop throughout their career. Toom and her colleagues (2021) note that professional agency is a necessary capability for teachers to steer their own learning. The transition from pre-service teacher education to teachers' work as well as the first five early career teacher years have been shown to be challenging (cf. Berliner, 1994; Heikonen et al., 2020; E 2022). It is a phase when many teachers choose to leave the teacher profession. Early career teachers should be supported and mentored effectively (Toom & Husu, 2021a, 2021b) to be able to and willing to continue. Early career teachers need to increase their efficacy, develop professional practices and routines, and become engaged to the school community. They also need extensive support in school community, for example in issues related to pupils' multiprofessional care, differentiation, administrative work in school, pupil assessment, and collaboration with parents (Heikonen et al., 2016).

10.4 Coherent Curriculum in Academic Teacher Education

Although the core characteristics of teachers' work are relatively similar everywhere, the national educational policies influencing teacher education, teacher education contexts, teacher education curricula, and the pedagogical methods and practices applied in teacher education vary significantly internationally (Cochran-Smith et al., 2015; Zeichner, 1983). Teacher education can take place in academic university contexts, universities of applied sciences, colleges, or even schools; Depending on the country, teacher degree regulations and teacher qualification regulations can be very different (Kansanen, 1991; Kansanen et al., 2000; Zeichner, 2006). Teacher education can be controlled with various educational policies or programme accreditations, or it can be a more autonomous duty of the universities, as it is in Finland (Toom & Husu, 2021a, 2021b). Also, the respect towards the teacher profession, the attractiveness of teacher profession and the entrance examination requirements to teacher education vary depending on the context.

They have influence on the candidates applying to and studying teacher education programmes, and further to the enactment of teacher education curriculum.

In many countries, teacher education has been influenced by different turns or emphases, namely practice, research, and accountability turns (Toom & Husu, 2021a, 2021b). This means that at some point, practical aspects related to teacher education, like versatile connections to schools and professional practice, teaching practice in schools, or practical skills of teachers' work have been emphasised. During the research turn, academic aspects, research-based, and research-related elements to the teacher profession have been in focus in the curricula and practice of teacher education. The accountability turn refers to the teacher education institutions and teacher educators which have been controlled in a variety of ways, e.g. through policies, evaluations, or reports in a certain direction.

Research-based master's degree level teacher education in the university, in which research, practice, and accountability elements are in balance, has been chosen as a relevant way to educate teachers in many countries, e.g. Finland, Estonia, and Norway. Finland has over forty years of experience enacting academic research-based teacher education in university contexts (cf. Kansanen, 1991; Kansanen et al., 2000; Toom et al., 2010). Research-based teacher education in the Finnish context means that student teachers are supposed to learn an inquiring orientation towards teachers' work while learning to become teachers with strong professional agency and extensive pedagogical expertise. Teacher education curriculum contents are based on research; student teachers reading of research literature as well as utilising teaching methods and pedagogical practices have been shown to be effective for learning, therefore inquiring methods are used in teacher education. Student teachers also study a variety of research methods during their studies, especially such methods that allow them to engage deeply with teachers' work while working in the profession (cf. Antonsen et al. submitted). They also do theses focusing on relevant topics in teachers' work during their teacher education. In research-based teacher education, teacher educators also do research in, on, and for teacher education to further improve and develop it (cf. Cao et al., 2023). In the Finnish academic master's level teacher education programme (300 ECTS), the curriculum is constructed according to the principles of the university degree. The curriculum consists of main subject studies in educational sciences, minor subject studies, multidisciplinary studies in the subjects taught in school, teaching practice, and general language studies.

From the viewpoint of characteristics of teachers' work and the capabilities and required expertise in the teacher profession, it is relevant to consider the characteristics of pre-service teacher education. Teacher education and its curricula can be organised in a variety of contexts in a variety of ways (Zeichner,

1983). Still, it is of vital importance that it has a clear organising theme and goals (Cochran-Smith et al., 2015), which are shared among all teacher educators involved in teaching and communicated thoroughly for the student teachers. It is essential that teacher education is coherent and constructively aligned (Biggs, 1996) with the organizing theme and learning goals set for student teachers studying in the programme. Coherence means that all study units in the curriculum are carefully planned and that they all contribute to the broad goals of the programme concerning student teacher learning to become a teachers (cf. Buchmann & Floden, 1992; Floden et al., 2021; Hammerness, 2006). It is essentially the collective duty of all teacher educators involved in teacher education in a teacher education institution to contribute to the construction, constant evaluation, and continuous revision of the teacher education curriculum. They are key persons who teach and supervise student teachers in theoretical and practical studies, and who also do research related to teacher education.

Thus, teacher educators' scholarship of teacher education, research capabilities and extensive pedagogical capabilities are of vital importance, since they are the ones who put the teacher education curriculum to practice (Ellis & McGuire, 2017; Floden et al., 2021). The enactment of teacher education curriculum depends on the teacher educators, their expertise, and the pedagogies they utilise in the practice of teacher education. It is not sustainable to build teacher education only on the current premises or on the details of the current national core curriculum for basic education (cf. Pantic & Wubbels, 2010; Korthagen, 2004; Juvonen & Toom, 2023), but rather, teacher education should cultivate teacher learning and learning of essential teacher capabilities (cf. Ball & Forzani, 2009). They should be included as a focus of teacher education.

Coherent research-based teacher education curricula can be structured in a variety of ways. The broader context in which teacher education takes place and teacher qualification requirements regulate the practices within teacher education. Teacher education curriculum in Finnish universities follow the same general structure as all other university curricula. The whole degree (300 ECTS) consists of a bachelor's degree (180 ECTS) and a master's degree (120 ECTS) in educational sciences. Faculties of education have broad autonomy in deciding about the content details of the curricula, and in practice, teacher education staff members construct the curriculum in detail. They negotiate the learning goals, research-based contents, and teaching and assessment methods in intensive collaboration. They also guarantee program coherence throughout the program and various courses (cf. Floden et al., 2021). Student teacher learning and development to become a teacher is at the core of the curriculum construction process. The aim is to provide students with a broad research base for the profession,

but also extensive practical skills through teaching practice periods. The aim is also to provide students with skills for continuous learning and professional development. The theoretical and practical studies in the curriculum vary in the different study years, and the demands placed on the students increases as students progress in their studies.

10.5 Supporting Teacher Learning in the Profession

There exist a variety of ways to support teacher learning in the profession and to organise in-service teacher education (Payne & Zeichner, 2017). It is also linked to the educational system, policies, resources, professional communities, and schools as well as characteristics of the pre-service teacher education in a certain context. Still, it is always of vital importance that it is relevant for teachers, it helps them to further develop their expertise, and it is coherent and of good quality. The most important things to keep in mind are the process and characteristics of teacher learning both individually and collectively.

A very essential, but difficult question related to pre- and in-service teacher education, is the coherence and continuum between them. In principle, it is clear that teachers would benefit from learning basic teaching skills and capabilities first in the in-service teacher education, and then, after some years in the profession, it could be beneficial for them to deepen their expertise further in the in-service teacher education in terms of more complex aspects together with their colleagues (cf. Leana, 2011; Vangrieken et al., 2015) and mentors from the same school. This would also allow them to develop their school community in a variety of ways. In practice, it is not always so easy to define which aspects of teacher expertise should be emphasised in pre-service teacher education and how to identify those that would be especially relevant in the in-service teacher education phase.

Increasing diversity in society and schools increases the complexity for the teacher profession and it further sets higher demands for teacher expertise. The themes related to diversity and intersectionality in schools (cf. PIONEERED, 2021–24) as well as moral and ethical aspects in schooling and education (Biesta & Burbules, 2003; Sanger, 2017) may require much more attention in teacher learning and in the in-service teacher education than before. There may be a need to support teacher expertise that allows them to build plural but equal schools which further develop society (Avalos & Rasquin, 2017; Cochran-Smith et al., 2009). Teachers need versatile capabilities for perceiving diverse pupils' learning needs and taking care of them (Noddings, 2010).

The changing landscapes of societies and schools as well as the teacher profession show that teachers need to learn *academic* and *practical* capabilities in the profession in the future, but also further recognize the need of *moral*, *situational,* and *contextual* capabilities (Ellis & McNicholl, 2015; Kelchtermans & Vanassche, 2017). This highlights the goals and tailoring of in-service teacher education to meet teachers' and schools' needs. Various institutions and communities have important roles in teachers' learning and in-service teacher education, because the learning needs can be versatile and none of the institutions can respond to them alone.

Academic university teacher education institutions have responsibility in producing and delivering *research* knowledge in pre- and in-service teacher education. *Schools as practical communities* have a central role in supporting teacher learning throughout their career and also in-service teacher education. Schools can support teachers' learning in the workplace and maintain professional networks. *Local communities and foundations* can support teachers' and school communities' learning and development by connecting them to the local contexts and surroundings. This can increase the relevance and coherence of teacher learning (cf. Moon, 2016).

10.6 Conclusion

Teachers' work is complex and challenging academic, social, interactive and moral work. A teacher works in versatile contexts and situations where long-term and hopeful educational goals and ideals must be taken into account while making quick decisions in constantly changing situations. The expertise and capabilities needed in the teaching profession are many, and it takes years to become a professional and expert teacher. Teacher learning is a complex and relatively slow process, which requires enough time and possibilities to concentrate on learning. Teacher expertise is constantly challenged, since many of the changes and needs of an increasingly diverse society occur in schools and in classrooms. The professional knowledge, skills base, and expertise therefore need to be solid and strong.

Thus, it is important to consider the characteristics and qualities of teacher education: What are reasonable organising themes and goals? Where should teacher education take place? How is it possible to maintain quality teacher education programmes? Academic master level research-based teacher education organised in the university context has been considered as a relevant way of organising teacher education in many countries. The research-based approach as

an organising theme, and the presence of research and inquiry in its versatile and various forms need to be guaranteed. More importantly, student teacher learning needs to be placed at the heart of the programme and all study units, practices and assignments need to support it. This means that the teacher education programme needs to be coherent in all its details. Teacher educators have a key role in building research-based and pedagogically coherent curricula for teacher education programmes, and thus, they are the ones whose research expertise and pedagogical skills actually matter in a significant way.

Teacher learning is likely to continue throughout the years during professional practice, so it is critical to consider how teacher learning can be best supported. The continuum between pre-service and in-service teacher education should also be learning-focused, coherent, and aligned. The teachers would benefit from collaboration of various institutions linked to them and to school. They would also benefit from collaboration with their peers, structures which enhance their learning continuously, and support from mentors (Toom & Husu, 2021a, 2021b). The support during the early career years of the teacher profession is especially critical (Meristo, 2016; Heikonen et al., 2020). The possibility to constantly steer one's own professional learning and development together with peers throughout the career both in the pre-service and in-service teacher education is crucial. This should be supported coherently and in a variety of ways (Ilomäki et al., 2017; Leana, 2011; Vangrieken et al., 2015).

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Fostering Coherence in Finnish Teacher Education: The MAP Model

11

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Abstract

This chapter discusses the process of fostering coherence in teacher education in Finland through a teacher competence model: the Multidimensional Adapted Process Model of Teaching (Metsäpelto et al., 2022). Originally developed to facilitate nationally unified student selection for initial teacher education, the MAP model represents a collective interpretation of teaching quality made by an expert panel from seven Finnish universities organizing teacher education. It encompasses the current evidence base and prevailing discourses on what teachers ought to know and be able to do. In this chapter, we examine recent trends in the Finnish educational landscape and present the argument that the MAP model holds promise for enhancing aspects of coherence within teacher education in both respect to its goals, emphases and shared guidelines as well as its implemented curricula across different units.

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Additionally, we present findings from an analysis comparing the curricula of primary school teacher education programs (grades 1 to 6) in two universities, which provides evidence of systemic coherence. The chapter concludes by offering a critical reflection on the implications of adopting a generic teacher competence model for fostering coherence in teacher education.

Keywords

Conceptual coherence • Institutional coherence • Systemic coherence • Competence model • Student selection

11.1 Introduction

Program coherence in teacher education refers to the extent to which the core ideas of teaching and learning are shared by individuals involved in educating students in teacher education programs; and the degree to which the various components of teacher education—learning goals and contents in the curriculum, instructional methods, assessment, coursework, and fieldwork—are aligned in supporting the high-quality teacher education and the development of effective teachers for the future (Hammerness, 2006; Tatto, 1996). To make informed decisions about curriculum design to enhance program coherence, stakeholders in teacher education need to have a shared understanding and a clear vision of the program's purpose, objectives, and expected outcomes (Cavanna et al., 2021; Hammerness & Klette, 2015). However, creating a shared vision in teacher education can be difficult for several reasons, for instance, due to teacher education having diverse stakeholders with different perspectives, interests, and agendas (Richmond et al., 2019). Hence, to negotiate coherence, it is critical to involve stakeholders in dialogue which can make use of existing frameworks and models for effective teaching.

This chapter describes the process of developing a common vision or framework for program coherence in Finland by creating a teacher competence model titled Multidimensional Adapted Process Model of Teaching, which is referred to as the MAP model for short (Metsäpelto et al., 2022). We will first describe the context of initial teacher education in Finland. Then, with the MAP model serving as a guiding framework, we will discuss the benefits of building program coherence for teacher education in terms of internal consistency and interconnectedness of concepts, theories, and practices (*conceptual coherence*; e.g., Canrinus et al., 2017; Grossman et al., 2008). Special focus will be on coherence across learning

opportunities within a specific study phase or subject area (*horizontal coherence*; Grossman et al., 2009) and over the course of studies (*vertical coherence*; Darling-Hammond, 2017) from student selection at entry phase to the transition to working life and in-service phase. We will also address the challenge of promoting *institutional* (Hermansen, 2020) and *systemic coherence* (Wilson et al., 2022) by fostering a shared understanding of teaching within educational institutions and across the national teacher education system. In this context, we present results from our analysis of the curricula of two universities, specifically examining the systemic coherence of the initial teacher education programs for primary school teachers. The chapter concludes by providing a critical reflection on the implications of adopting a generic teacher competence model in the pursuit of coherence in teacher education.

11.2 The Context: Finnish Teacher Education

Finland is widely recognized as a country that highly values the teaching profession. In Finland, initial teacher education (ITE) programs are structured as a three-year bachelor's degree followed by a two-year master's degree. These programs encompass a comprehensive curriculum that includes studies in education sciences, subject-specific content, pedagogy and research methods combined with several teaching practices. While primary school and special education teacher students graduate at the master's level, early childhood education teacher students receive their teacher's degrees at the bachelor's level. However, those who aspire to assume leadership positions in the educational field can pursue further studies at the master's level.

The popularity of many ITE programs (especially primary school and special education) in Finland is remarkable, evidenced by a significantly higher number of applicants compared to the limited number of available spots. This reflects the high regard for the teaching profession and the value placed on quality teacher education in the country. Overall, Finnish teacher education strives to produce highly competent, reflective, and research-informed educators who are well-prepared to meet the diverse needs of students and contribute to the improvement of education as a whole.

Initial teacher education in Finland is primarily organized by eight universities located across different regions of the country. These universities have high autonomy in shaping the specific content and structure of their programs, and they are geographically dispersed to ensure that teacher education programs are accessible to students from various parts of Finland.

11.3 Developing a Shared Vision: Multidimensional Adapted Process Model of Teaching

By working together, stakeholders involved in teacher education can negotiate a shared vision of the goals of teacher education—constituting high teaching quality—that support the development of effective teachers. In Finland, building a shared vision of teaching quality became necessary to support the process of selecting students for initial teacher education, which was reformed in the year 2020. Teacher education in Finland differs from many other countries in that prospective teachers undergo a rigorous student selection process prior to beginning of their studies. The two-phase student selection is designed to assess the suitability of prospective teachers for the profession and their potential to excel in the demanding teacher education program. The first phase of student selection evaluates the applicants' cognitive skills by utilizing matriculation examination scores and a source-based multiple-choice test designed annually for this purpose (Haataja et al., 2023). The second phase involves an aptitude test, which includes multiple short interviews, such as assessing applicants' social and problem-solving skills and communication abilities (Metsäpelto et al., 2022).

With thousands of applicants participating in the two-phase selection process every year, organizing the entrance examination for teacher education in Finland demands significant resources and investment from the universities. Given that there is no separate qualification phase at the end of teacher education studies, student selection serves as a crucial gatekeeper in the Finnish educational system. Therefore, ensuring the validity and reliability of the entrance examination is of utmost importance, and student selection methods must be grounded in research and incorporate best practices in the field (e.g., Haataja et al., 2023; Metsäpelto et al., 2022).

As part of the 2020 reform, the selection process for teacher education was standardized across all eight universities that offer such programs, allowing applicants to apply to multiple programs (such as primary school teacher education, special teacher education, and early childhood education) within a single university or to multiple universities by taking a single entrance examination, which is administered and scored uniformly. Developing a national joint entrance examination required a shared understanding of the qualities that define effective, high-quality teaching. This involved establishing a common understanding among stakeholders across universities regarding the key skills in teacher profession that are developed and nurtured during teacher education studies, as well as the skills and competencies expected of applicants during the entry phase and, thus, evaluated during the student selection phase.

The challenge of forming a common framework or model depicting teacher's key competences was unprecedented in the Finnish educational landscape (or even internationally), as representatives of teacher education institutions had not previously strived to form a shared vision, even though some organizing principles had been shared among teacher education programs across different universities. One such principle is adherence to research-based teacher education, which has been described as a paradigm, orientation, leading principle or an organising theme of Finnish teacher education (Krokfors et al., 2011; Toom et al., 2010). The principle that the contents of the curriculum and the practice of implementation of teacher education are guided by scientific research and knowledge was also the starting point for the design of the current teacher competence model, the MAP model.

The MAP model was built by an expert panel that included representatives from seven universities offering university-based initial teacher education degree programs in Finland. The work was part of the OVET project (2017–2020; https://sites.utu.fi/ovet/en/) funded by the Finnish Ministry of Education and Culture. An expert panel conducted a thorough examination of academic literature and studies on education to create a consensus and analyze the prevailing discourse in the field. The process of building a model also included discussions at each university with a pool of teacher educators, researchers, and representatives of the universities' Teacher Training Schools. The preliminary model was also presented to national stakeholders, including representatives from the Ministry of Education and Culture and the Trade Union of Education in Finland in professional meetings. The model was presented in several international conferences, and discussions were carried out with Professor Sigrid Blömeke, who, with her colleagues, had published the original teacher competence model on which the MAP model was based.

The development of the MAP model was a challenging but ultimately rewarding collaborative endeavor involving expert panel members from seven universities, who brought with them diverse organizational backgrounds, unique values, and identities shaped by local policy environments and social and cultural conventions (Hermansen, 2020). The process of building the model has been described in detail by Metsäpelto and colleagues (2022). Briefly, in a multiorganizational setting, a multivoiced dialogue was initiated, incorporating features of an expansive learning cycle (Engeström & Sannino, 2010). Several cycles of panel discussions were conducted that revealed differing views, contradictions, and personal and institutional sense-making. The differing views became the driving force of the development of common framework of teacher competence that required collective agency and reflection of the key domains in teacher profession.

The first phases of model building process included specifying the goal, searching for information, and brainstorming. Blömeke et al.'s (2015) teacher competence model was selected as the starting point for the MAP model. This model outlines teacher competences as a continuum where dispositions (e.g., teacher knowledge, affect, motivation) are dynamically interlinked with observable job performance (e.g., quality of instruction), and the situation-specific skills such as ability to perceive and interpret classroom interaction and make decisions on instruction to mediate the connection between these two domains of competence. To create the MAP model, the expert panel undertook a rigorous process of refining and specifying competencies from Blömeke et al.'s (2015) model. This process involved conducting a thorough review of relevant research (Grant & Booth, 2009) and engaging in dialogue to encourage individual and group reflection. The aim was to create a model that could represent the diverse contexts of the teaching profession, spanning from early to special education and content disciplines. The next step consisted of establishing the research base and the last steps of refining and finalizing the model in terms of agreeing on the key constructs, their operationalizations and relations. The iterative process of revisiting the key competence domains continued for 16 months. The resulting MAP model was a collective interpretation of the current evidence base and the prevailing discourses on what teachers should know and be able to do. The MAP model is presented in Fig. 1.

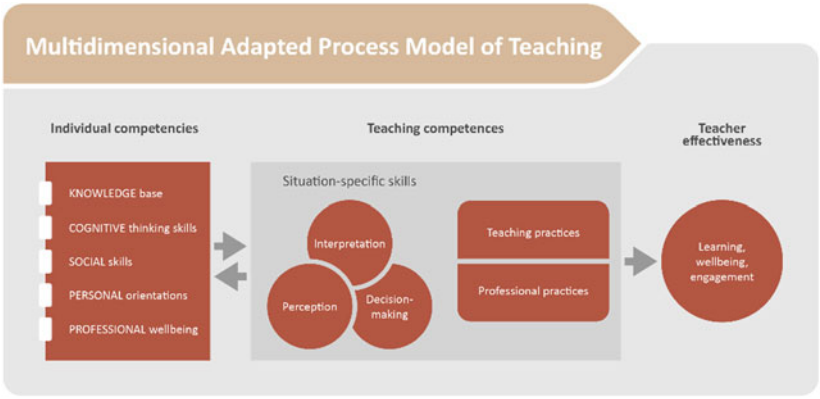

Fig. 1 The Multidimensional Adapted Process Model of Teaching (the MAP model), adapted from Blömeke, Gustaffson and Shavelson (2015)

The MAP model depicts the process of teaching and student learning as a dynamic system. Instead of constructing teacher competences narrowly through a limited set of skills, teaching is viewed as a multidimensional process that involves multiple components, such as teacher knowledge, social and emotional skills, beliefs and values, and instructional practices and emotional support, which all contribute to teaching quality and outcomes of teaching and learning at the student level. Student outcomes are broadly defined to include, for instance, student gains in basic academic skills and learning objectives but also motivational, social, and affective outcomes and student engagement in learning (Seidel & Shavelson, 2007).

An important conceptual distinction in the MAP model differentiates between teacher's individual competencies and teaching competences. The category of individual competencies refers to underlying yet developing competencies, such as knowledge base of teaching and learning, cognitive and social skills, personal orientations (management of oneself in the role of teacher, e.g., teacher identity and motivation for teaching career) and professional wellbeing (see Table 1).

The category of teaching competences refers, first, to teaching practices, defined through the quality of classroom processes. Classroom quality is affected by the teacher's ability to organize optimal learning environments to maximize students' engagement and knowledge-building and to facilitate a community of learners. For instance, according to Hamre et al. (2013), high-quality classrooms are characterized by a positive emotional atmosphere and teacher's skills to respond sensitively to students' needs. There are also clear behavioral expectations and proactive classroom behavior management strategies combined with instructional support that promotes students' higher order thinking and expands their understanding.

The category of teaching competences, as defined in the MAP model, includes a range of responsibilities beyond the classroom, collectively referred to as professional practices. These practices involve tasks such as planning and preparing instruction, organizing learning content into lessons that help students achieve their learning objectives, and employing analytical skills to select appropriate learning goals, assessment methods, materials, and resources. Other professional practices involve effectively communicating with parents and involving them in school partnerships, actively engaging in professional communities, advancing one's professional development, and demonstrating a motivational drive to incorporate new knowledge into practice. Additionally, these practices include taking on leadership roles and contributing to pedagogical development within one's school community (Metsäpelto et al., 2022).

Table 1 Descriptions of individual competencies in the MAP model and the frequency of mentions in the curricula of two universities

MAP Category	Description	Number of mentions in curricula		
		All	UTU*	JYU**
1 Knowledge base of teaching and learning		271	126	145
Content knowledge	Subject-specific knowledge of facts, concepts, and theories	98	48	50
Pedagogical knowledge	Cross-curricular knowledge of pedagogical principles and strategies (e.g., motivation)	21	6	15
Pedagogical content knowledge	Knowledge combining the content of the subject and teaching practice (e.g., differentiation)	111	54	57
Practical knowledge	"Wisdom of practice" built through practical teaching experiences and their reflection	7	2	5
Contextual knowledge	Knowledge of the school system and curriculum (e.g., effect of economic factors on schooling)	34	16	18
2 Cognitive thinking skills		155	72	83
Higher order thinking skills	Understanding, interpreting, classifying, comparing, analyzing, and applying information	55	19	36
Critical thinking	Analyzing ideas and arguments, and using reasoning to formulate beliefs and solve problems	17	6	11
Creativity	Generating original or inventive ideas, willingness to evaluate, and refine ideas by being open and responsive to ideas of others	63	38	25

(continued)

Table 1 (continued)

MAP Category	Description	Number of mentions in curricula		
		All	UTU*	JYU**
Communication, argumentation, and reasoning	Articulating thoughts and ideas and formulating arguments skillfully using diverse communication skills and media	2	0	2
Metacognition	Knowledge of and regulation of one's own cognition (e.g., monitoring learning processes)	18	9	9
3 Social skills		66	38	28
Relational skills	Ability to listen, take turns, seek help, convey empathy, cooperate, and manage conflicts	37	18	19
Emotional competency	Ability to perceive, understand, regulate, and express emotions	4	1	3
Diversity competency	Ability to respond to individual differences in ways that support and respect the dignity of each learner; commitment to equal treatment	15	12	3
Intercultural competency and interaction	Ability to navigate sensitively in multicultural contexts and consciousness and reflective stance around issues such as ethnicity and religion	10	7	3
4 Personal orientations		48	18	30

(continued)

Table 1 (continued)

MAP Category	Description	Number of mentions in curricula		
		All	UTU*	JYU**
Personal dispositions	Adaptive ways of thinking, feeling, and behaving in diverse situations across time (e.g., desire to be responsible, as in conscientiousness)	0	0	0
Self-conceptions	Beliefs and perceptions about oneself in different life domains (e.g., teacher self-efficacy)	4	1	3
Professional beliefs, values, and ethics	Beliefs about nature of knowledge, learning and learners; personal values, ethical standards and moral obligations of the teaching profession	22	6	16
Motivational orientation	Interest in and continual commitment to teaching profession and professional development	0	0	0
Professional identity	Dynamic process of understanding oneself as a professional, agency in identity negotiation	22	11	11
5 Professional well-being		5	4	1
Occupational well-being	Satisfaction in teacher studies/work; experiencing vigor, dedication, and immersion in work	5	4	1

(continued)

Table 1 (continued)

MAP Category	Description	Number of mentions in curricula		
		All	UTU*	JYU**
Stress management strategies	Coping with expectations and workload utilizing individual and community resources	0	0	0
Teacher resilience	Capacity to overcome stressors and bounce back from adversity	0	0	0

Note: *University of Turku, Finland; ** University of Jyväskylä, Finland

In line with Blömeke et al.'s (2015) competence model, the MAP model also includes teacher's situation-specific skills of perception, interpretation, and decision-making processes. They encompass the abilities to perceive, make sense of, and respond to the dynamic and multifaceted aspects of the teaching and learning environment. These processes play a vital role in teachers' ability to effectively plan, adapt, and deliver instruction to meet the diverse needs of their students.

According to the model, the components in the model are in a transactional relationship with each other and change over time when they are influenced by initial teacher education, continuous professional development, and working life experiences. The MAP model is already in use in Finnish initial teacher education and recently in professional development programs for in-service teachers, as well as in research on teaching and teacher development (Koski et al., 2023; Metsäpelto et al., 2022).

11.4 Building Conceptual Coherence to Teacher Education Through the MAP Model

Conceptual coherence in teacher education refers to the internal consistency and interconnectedness of the various concepts, theories, and practices that are taught to student teachers as part of their study paths within a specific teacher education program (Canrinus et al., 2019). Such coherence is important because learning to teach is enhanced when student teachers encounter consistent ideas across learning experiences that help them to make sense of the phenomena and make

learning experiences more cohesive, interpretable and meaningful (Hammerness, 2006).

Teacher education programs have faced criticism for lacking cohesion, with individual components appearing disconnected and failing to connect student teachers to the larger aims of education and the relationships between different aspects of teacher education (Grossman et al., 2008). Typically, fragmentation and disjointedness relate to a lack of links between theory and practice, that is, coursework organized at the university and field experiences organized at local schools or teacher training schools (Canrinus et al., 2017). Limited conceptual coherence and fragmentation in teacher education programs may result in student teachers experiencing uncertainty about who they are as teachers (Rogers, 2011). They may also have difficulties in formulating a vision of their own teaching and have an increased risk of leaving the teaching profession (Hammerness, 2014).

The MAP model was originally designed to serve as a guiding framework for Finnish student selection to teacher education programs. It was soon acknowledged, however, that the model also has the potential to bring conceptual coherence to our understanding of the core skills and knowledge which are currently taught in teacher education programs and included in curricula. Although research on the coherence of Finnish teacher education programs has been scarce, the little available evidence indicates that student teachers have, at least in some teacher education programs, perceived their program as lacking coherence, indicating the need for improvement (Canrinus et al., 2017).

The advantage of the MAP model is that it presents teaching quality as a comprehensive whole. The model unifies various previously separate or unconnected elements of teacher and teaching research, ultimately leading to a holistic understanding of the teaching profession. The holistic approach contrasts many other insightful models that determine knowledge and skills critical to teachers from a more narrow, specific view point (e.g., competences critical to mathematics teachers; Baumert & Kunter, 2013). The model is based on the prior extensive analysis of academic literature on education, making it consistent with the values of Finnish teacher education, which emphasizes a research-based approach (Krokfors et al., 2011).

The analysis of the implementation of the MAP model as a conceptual framework in Finnish teacher education programs reveals variations across universities. For instance, one university places a strong emphasis on the MAP model, incorporating it prominently in its primary school teacher education curriculum. Several other universities have used the MAP model when determining the essential skills and objectives for their teacher education programs, although the model itself may not be specifically referred to in the curriculum. In some universities,

the MAP model has been used as a theoretical basis and guiding framework for teaching practices in the Teacher Training Schools. In Finland, teacher education goals and standards are regularly updated through periodic curriculum reforms. The MAP model was introduced recently in 2022, and its use as a conceptual framework in teacher education may become more prominent in the future.

11.5 Promotion of Horizontal and Vertical Coherence in Teacher Education

Horizontal coherence refers to the consistency and integration of different components of a teacher education program within a specific study phase or subject area, for instance, in the first study year or in a particular course (Grossman et al., 2009). It involves aligning the objectives, content, instructional strategies, and assessment methods to ensure that they support the overall goals and objectives of the program. One particular challenge during any study phase has been combining theoretical studies and teaching practice into a coherent learning experience. Student teachers often consider teaching practice as a highly meaningful learning experience, whereas coursework focusing on theoretical knowledge is often perceived as distant and detached from practical teaching in classrooms.

The MAP model promotes a close connection between theory and practice, with a focus on using knowledge to drive action. Theory and practice in teaching are integrated, as demonstrated in the construct of situation-specific skills, which involves a teacher's ongoing process of observing significant events in the classroom, interpreting their meaning, and making informed decisions, such as selecting an instructional approach (Blömeke et al., 2015; Kaiser et al., 2015). In this process, theoretical understanding is vital for teachers as it enables them to understand and analyze students' thinking, pay attention to other crucial elements of classroom dynamics and make informed decisions about the course of action in concrete teaching practice. The MAP model, by highlighting the close relationship between theory and practice, can facilitate the integration of theoretical and practical studies and enhance students' appreciation of the significance of theoretical knowledge.

The aligment of coursework and field experiences into a seamless continuum of ITE ensures that the knowledge and skills acquired by student teachers are connected and reinforced throughout their studies, known as vertical coherence (Darling-Hammond, 2017). The analysis of the implementation of the MAP model in promoting vertical coherence indicates that it has helped to determine

the essential skills and abilities required at the beginning of teacher training (especially at the student selection phase) (Metsäpelto et al., 2022). During the entry phase to teacher education, applicants are not required to already have teaching skills, and simulated teaching exercises are not part of the admission process in Finland, although they may be used in other student selection procedures (e.g., Bowles et al., 2014). Thus, at the selection phase, the MAP model directs attention to and emphasizes individual competencies, many of which are markers of the applicant's capacity to successfully complete teacher education and their overall suitability for the teaching profession.

Additionally, the MAP model can be utilized to construct a curriculum that facilitates the growth and enhancement of various skills and abilities throughout a teacher education program. For instance, in a primary school teacher education program in one Finnish teacher education department, teaching practices are arranged in a progression that increases in difficulty and complexity (O'Neill et al., 2014). The first teaching practice includes transitioning from being a student to a student teacher, learning to observe students and groups of students to gather information on their learning, motivation and other attributes as part of situation-specific skills, and conducting brief teaching sessions. The next teaching practice in the third year of study marks a shift towards taking on a teacher's role in the classroom. This involves planning and executing extended teaching sessions, and learning to evaluate the quality of teacher-student interaction in the classroom (Hamre et al., 2013).

Using the MAP framework to understand these learning experiences, it can be seen that the situation-specific skills practiced in the first teaching practice and the high-quality teacher-student interactions rehearsed in the second teaching practice are critical components that contribute to the quality of the classroom. A teacher's capability to recognize significant events in the classroom is the foundation for effective communication and interaction with students (Blömeke et al., 2020). By emphasizing the connection and accumulative nature of learning between each phase of teaching practices, the MAP model helps student teachers understand the progression and improvement of their skills, thereby enhancing the perceived coherence of the teacher education program.

In continuing professional development for in-service teachers, the MAP model can serve as a reflection tool for teachers to help identify skills or knowledge domains which need to be updated. For example, following the COVID-19 pandemia, maintaining professional well-being has been recognized as an increasingly important competency domain (Warinowski et al., 2021), which one can effectively learn to regulate only after transitioning to working life with everyday experiences in teaching. A milestone has been achieved in the provision of

continuing professional development to in-service teachers with the collaboration of seven universities that developed the MAP model. An online course, aimed at teachers, has been developed to increase in-service teachers' awareness of the key competences and to educate them about the MAP model. The Regional State Administrative Agency, which is a key player nationwide in organizing continuing education for in-service teachers in Finland, has published a MAP model based online course in spring 2023.

11.6 The MAP Model in Promoting Institutional and Systemic Coherence in Teacher Education

Institutional coherence refers to the degree of alignment and consistency within an educational institution regarding its policies, practices, and programs for teacher education (e.g., Hermansen, 2020). Systemic coherence, on the other hand, functions at macro-level and requires nationwide partnership among institutions, policymakers, and other stakeholders to ensure that all components of an educational system work together in support of the vision of teaching (Wilson et al., 2022). Program leaders in teacher education have a central role in achieving coherence at institutional and systemic levels, although it necessarily requires dialogue and negotiation at all levels of the educational system.

Regarding institutional coherence, the goal of the MAP model was to identify competence domains, which are relevant across a wide range of teacher education programs and, thus, generic to teaching. The major teacher education programs in Finland include primary school teacher (grades 1 to 6), special education teacher and early childhood education teacher programs, but the perspectives of subject teachers and career counsellors were also considered when the model was constructed. Thus, the model was designed to focus on generic and transferable teacher competencies that would be common for all teacher education programs within a particular institute, thus bringing consistency to our understanding of teachers and teaching. Overall, the development of the MAP model for teacher competence was inspired by the global dialogue about teachers and teaching across the world (e.g., Schleicher, 2011). A comprehensive review conducted by Paine et al. (2016) highlighted the increasing global consensus on learner-centered teaching, fostering active learning and problem-solving, and embracing student diversity within international research discourses. The MAP model was conceived as a reflection of the evolving global perspectives on teaching and was informed by the growing body of research in the field, fostered by

an increasingly collaborative international community. Although aiming to identify the "core" of teaching quality across different teacher professions, it was initially acknowledged that some specific teacher competences are likely to take somewhat different emphases across teacher professions, for instance, due to different age groups of learners (e.g., early childhood education and primary school teachers).

The MAP model can be interpreted as an affordance that has a high potential for strengthening the coherence of teacher education beyond single teacher education programs towards coherence at systemic levels. Recently, Jyrhämä (2021) reviewed the contents and organization of teacher's pedagogical studies in Finnish institutions that result in the qualification to work as a teacher. The analysis showed that although pedagogical qualifications are regulated by legislation, pedagogical studies were fragmented and there was significant variation between institutions in how the pedagogical studies were organized, signaling low systemic coherence in the consistency and uniformity of teacher qualifications in Finland. The study suggests a continued need to evaluate the coherence of teacher education programs at education systemic level and seek ways to enhance it.

11.7 A Case Study on Systemic Coherence in Initial Teacher Education Curricula: A Comparative Analysis of Two Universities

As an illustration of analyzing systemic coherence, we examined the curricula of the same ITE program at two Finnish universities. Curricula can serve as proxies or indicators of systemic coherence, as their alignment and similarities across institutions can offer insights into the extent of shared understanding within the broader educational system.

We analyzed how the five individual competency domains of the MAP model (see Table 1) were reflected in the learning objectives of primary school teacher education curriculum texts. The data consisted of the primary school teacher education curricula that were in effect in 2019 and openly available on the websites of the University of Turku and the University of Jyväskylä. The methodological approach used was document analysis, which involves analyzing written material that was originally published for a purpose other than research (Bowen, 2009).

The data was analyzed using a qualitative theory-guided content analysis approach. The curriculum texts were reviewed to identify and code mentions pertaining to the individual competency domains. In cases where coding was ambiguous, discussions were held, and necessary adjustments were made. Then,

mentions related to the five individual competency domains were compiled together and thematically organized in an effort to understand and interpret the type of competency the ITE program aimed to develop. Thematic categories were created by identifying the connections within the expressions and relating them to the MAP model and existing research literature. For a more detailed description of the procedure, please refer to Metsäpelto et al. (2021).

The results showed that, in the primary school teacher education curriculum texts, a total of 544 mentions of learning objectives associated with the MAP model's competency domains were identified. As can be seen in Table 1, the domain with the highest number of mentions in both universities was Knowledge base of teaching and learning, totaling 271 mentions. The domain of Cognitive skills was also prominently mentioned, with a total of 155 mentions. The domains of Social skills and Personal orientations had relatively fewer mentions, 66 and 48, respectively. The domain of Professional wellbeing had the fewest mentions, with only 5. When comparing the mentions in curricula between the two universities, we observed that although the number of mentions was not identical, the overall magnitude was highly similar. This indicates a significant level of consistency and alignment in terms of learning objectives within the teacher education programs of these universities. It suggests that there is a shared understanding or agreement on the key components of initial teacher education, at least across these two institutions.

11.8 Conclusion

In this chapter we have discussed coherence of teacher education by focusing specifically on the benefits of using a unified teacher competence model, the MAP model, as a guiding framework for developing national coherence in Finnish teacher education.

The use of the MAP model has a lot of potential in improving teacher education coherence, but it also has its challenges. One of the challenges is the risk of having a vision that is too strict, limiting the opportunities for student teachers to discover different viewpoints and ideas about teaching and learning (Buchmann & Floden, 1991; Hammerness, 2006; Richmond et al., 2019). To overcome this risk, it has been recommended that teacher education programs should have a clear framework (such as the MAP model) while also allowing room for exploration and creativity (Hammerness, 2006). This will guard against overly constrained views on teaching and learning and provide support for student teachers development of agency and negotiation of teacher identity. One advantage of the MAP

model is its presentation of main competency domains at a relatively general level, allowing for student teachers to interpret and apply the model in their own unique ways. Additionally, the model encompasses a wide range of competencies, which provides flexibility and accommodates diverse perspectives.

The construction of the MAP model is the result of a multidisciplinary approach that integrates educational psychology, learning research, as well as contextual and constructivist perspectives from fields such as educational sociology and multicultural research. While some may argue that the model may appear to be missing certain important concepts when viewed from a single perspective, its true benefit lies in its ability to provide a holistic view of teaching. By incorporating diverse perspectives, the model offers a comprehensive understanding of the complexities and nuances of the teaching quality. Yet, for the communities of teacher educators and educational leaders, the process of seeking and negotiating coherence can be a demanding process, and it may be realistic to accept that all teacher educators in any given program will not agree with the articulated vision. In order to have a better chance to achieve a shared vision of teacher education at all system levels, the process must invite wide involvement (Bruch & Higbee, 2002) so that there is a sense of program ownership among those involved in educating prospective teachers.

Through the analysis of curricula, we investigated the level of coherence in learning objectives within the teacher education programs of two universities. Using the MAP model as a framework, the results indicated that these institutions were striving towards relatively similar learning objectives, suggesting the presence of a cohesive vision of teaching. It is important to note that curriculum similarity alone does not guarantee systemic coherence, but it does provide a valuable starting point for assessing the alignment and consistency in ITE. These findings have implications for discussions and strategies aimed at improving coherence and quality in ITE programs within the broader educational system, which, in turn, can contribute to the overall enhancement of teacher education and the promotion of effective teaching practices.

Finally, it is important to recognize that coherence in education is not a fixed or objective aspect of an system, but rather a subjective perception of how the different parts of a teacher education program function together (e.g., Penuel et al., 2009). The MAP model has the advantage of making the connections between the various knowledge areas and skills required for the teaching profession clearer, thereby increasing shared understanding and dialogue in making the learning experience more research-based, meaningful for student teachers, and visible for teacher educators.

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12 Identifying Core Practices as a Framework for Teacher Educators' Cooperative Professional Development

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Abstract

Connecting different knowledge domains is one of the main problems in teacher education. This chapter showcases a cooperation between two teacher educators at the University of Oslo. The aim of the contribution is two-fold. We identify specific core practices that are highly relevant for foreign language teaching in schools. Based on our experiences, we also propose a cooperative model for teacher educator competence development using an investigative approach to core practices as a framework. Such a cooperative model can contribute to the creation of better connections between different teacher education domains and, by doing so, promote student teachers' sense of coherence.

Keywords

Professional development • Core practices • Pedagogical knowledge • Pedagogical content knowledge

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12.1 Introduction

A recurring criticism of teacher education is fragmentation (Conway & Munthe, 2015; Moon, 2016; Zeichner, 2012). Student teachers' experience of fragmentation may be caused by teacher educators having little insight into each other's teaching and limited knowledge of what students learn in other parts of the program. Hammerness (2006) emphasizes conceptual and structural coherence as important features for coherence in teacher education programs. Conceptual coherence implies shared visions of good teaching—what and how student teachers learn—among the teacher educators (Hammerness, 2006). However, "simply having a vision of good teaching is not enough. The vision needs to inform program design, curriculum and pedagogy, and shape what and how new teachers learn" (Klette & Hammerness, 2016, p. 29). Structural coherence concerns designing the various components in the program (courses on campus and practice periods in schools) so that they build on each other and can reinforce each other (Hammerness, 2006). Formal education or training of teacher educators has traditionally received little attention (Loughran, 2014; Lunenberg et al., 2014), and few countries have designated programs for becoming a teacher educator at university (van Veen, 2013). Dinkelman (2011) points out that lack of formal education to become a teacher educator and lack of guidelines and standards for the work they do contributes to the fact that what characterizes what teacher educators do tends to be private and not shared among colleagues. In Norway, campus-based teaching in teacher education is provided by scholars with a specialization in either pedagogy, subject didactics, or academic subjects. In this chapter we describe and reflect on how a model for co-learning among two teacher educators can contribute to a closer connection between pedagogy and foreign language subject didactics in teacher education.

12.2 Theoretical Foundations

Grimen (2008) points out that what binds different fields of knowledge in teacher education together is how they in various ways are relevant for planning, implementing, and reflecting on teaching in schools. Thus, the meaningfulness and relevance for practice is of the essence. Previous research has advocated for a turn towards practice, which means strengthening on-campus teaching by making it practice-oriented (Darling-Hammond et al., 2017; Forzani, 2014) and by developing and using practice-oriented forms of learning and teaching (Ball & Cohen, 1999; Forzani, 2014; Jenset, 2018; Lampert et al., 2013; McDonald et al., 2013).

To strengthen the relevance of campus-based teaching for practice, Grossman et al. (2009a) outlined a framework of representation, decomposition, and approximation of practice as pedagogies for professionals. *Representation of practice* is about "all of the different ways in which the work of practitioners is made visible" to student teachers (Grossman, 2018, p. 8). It can be displayed in on-campus teaching through modelling and through meta-discussions of various teaching practices. We understand meta-discussions as explaining and talking about the specific learning activities student teachers encounter and explicitly addressing how similar activities can be used in their future teaching practice in real classrooms. Teacher educators model the profession they educate for (Ulvik & Smith, 2016), thus the teacher educator is constantly holding a dual role (Ben-Peretz et al., 2010). On the one hand, we must teach student teachers about academic knowledge and students' learning in school, and on the other hand, we must constantly be aware of our own teaching, modelling both learning and the role of teacher. However, a challenge for student teachers when it comes to learning from representation is "knowing how to look, what to look for, and how to interpret what is observed" (Grossman, 2018, p. 9). Therefore, using representations of practice involves *decompositions of practice*, which means "breaking down a complex practice into its constituent parts for the purpose of teaching and learning" (Grossman, 2018, p. 9). *Approximations of practice* provide student teachers "with the opportunity to enact elements of practice with a high degree of support and under conditions of reduced complexity" (Grossman, 2018, p. 9). School practice during teacher education can provide ample opportunities for decomposition and approximation.

The concept of *core practices*, which includes decomposition of vital parts of representation of teaching practice, was introduced by the Core Practice Consortium "as a way to support teachers and teacher educators to integrate work on developing skills with work on developing the knowledge and judgement required to put those skills to use when working with students." (Grossman et al., 2018, p. 4). Core practices in teaching are identifiable components that teachers enact to support learning. Core practices consist of strategies, routines, and moves that can be unpacked and learned by teachers. Grossman et al., (2009b, p. 277) have identified the following characteristics of what constitutes core practices:

- Practices that occur with high frequency in teaching
- Practices that student teachers can enact in classrooms across different curricula or instructional approaches
- Practices that student teachers can begin to master

- Practices that allow student teachers to learn more about students and about teaching
- Practices that preserve the integrity and complexity of teaching
- Practices that are research-based and have the potential to improve student achievement

Different institutions have developed their own sets of core practices, also described as high-leverage practices, and the various lists vary in scope and content-specificity. However, we have not been able to identify a satisfactory list of core practices for foreign language didactics. Moreover, such lists must be used with caution and adapted to the specific subject and school context in which the student teachers are being prepared for. Therefore, an important goal of our study is to identify core practices that are important in foreign language teaching in lower and upper secondary schools in Norway.

Forzani (2014) argues that it is important to disseminate experiences through obtaining scientific knowledge about the use of practice-oriented forms of learning and teaching. However, research on practice-oriented learning and teaching methods in teaching on campus is scarce (Cochran-Smith et al., 2016; Forzani, 2014; Haugan, 2011; Jenset et al., 2018). Providing opportunities to enact teaching with an emphasis on core practices, e.g. through micro-teaching, is an example of this turn towards practice that has had a major impact on teacher education at UiO in the last decade (University of Oslo, 2022).

Being a teacher educator involves more than being a competent schoolteacher. Loughran (2013) argues that implicit in the term teacher educator, there is a premise that "a teacher educator should be a scholar, and that scholarship itself is deeply embedded in an interactive process of research and practice that has a major focus on learning about the teaching of teaching" (p. 20). Thus, another prerequisite for developing professional teacher educators is to research and develop one's own teaching practice and ensure teaching quality in a community of teacher educators. Peer mentoring can be used in teacher educators' professional development to foster a professional community between teacher educators and as part of organizational development of the institution (Lauvås et al., 2016). Peers can provide each other with relevant and useful feedback on teaching practice (Curlette & Granville, 2014) and peer-based feedback on teaching can provide support regarding handling challenges and motivate teacher educators to experiment creatively to improve their teaching practice (Price et al., 2011). Moreover, mentoring that promotes collegial work and a meaningful dialogue may help professionals develop and improve their teaching practice and avoid

isolation (Breidenstein et al., 2012). We argue that a culture for collegial collaboration among teacher educators can enhance peer-learning among colleagues and increase the individual educators' knowledge of other parts of the multifaceted program than what they themselves teach. We study how core teaching practices are reflected in a foreign language didactics course. At the same time, we describe how an observation-based approach can contribute to a closer connection between pedagogy and subject didactics in teacher education. This study contributes new knowledge of practice-oriented teaching practices in foreign language didactics in teacher education and aims to answer the following research questions:

RQ1: How do core practices manifest themselves in a foreign language didactics course?

RQ2: How can a conversation about observations of core practices promote integration between pedagogy and foreign language didactics?

12.3 Methodology

The current chapter reports on a qualitative case study (Stake, 1978) from 2021 inspired by a developmental approach in an observation-based clinical supervision model (McGhee & Stark, 2018) which is "formative and reflective in nature and focused on the needs of the individual teacher" (p. 727). The aim of this model is to promote collegial work and a meaningful dialogue that help us develop our teaching practice as teacher educators. Our study is a combination of collegial peer-observation (Lauvås, 2016) and reflection with the purpose of becoming familiar with each other's teaching and to increase our knowledge about what student teachers learn in other parts of the program. The object studied was a foreign language didactics course taught by author 1; author 2, a pedagogy teacher, was the observer. In total, the class observed consisted of 26 student teachers, of which 6 had French, 6 had Spanish and 12 had German as a teaching subject. Before we elaborate upon the methodological aspects of our study in more detail, a brief description of the context of our study is given.

12.3.1 Context

The studied foreign language didactic course is part of two consecutive profession-oriented pedagogy courses ("PROF"-courses) in terms six and seven of the five-year integrated master program at UiO. In this program student teachers become qualified for teaching in two subject areas in lower and upper secondary

Table 1 Study design for UiO's 5-year integrated master program in teacher education (grades 8–13) exemplified for a student teacher with Norwegian as their minor and German as their major subject

Term	10 ECTS	10 ECTS	10 ECTS	Practice
10	Master thesis in German			
9	German	German	German	15 days
8	German	German	German	
7	Profession oriented course (PROF-course) 3			45 days
6	German	PROF-course 2		25 days
5	German	German	German	
4	German	German	Exphil[1]	
3	German	German	PROF-course 1	15 days
2	Norwegian	Norwegian	Norwegian	
1	Norwegian	Norwegian	Norwegian	

school (grades 8–13) in Norway. The master program includes 180 ECTS of courses in one area of expertise (major subject), including a master thesis, 60 ECTS in a second subject area (minor subject) and 60 ECTS in profession-oriented pedagogy education ("PROF"-courses) as well as 100 days of practical training in schools. Table 1 illustrates the study design for the master program and shows the distribution of courses and school practice over five years. The model assumes progression in all areas of becoming a professional teacher.

The PROF-courses are designed as integrated courses and contain a pedagogical sub-course, subject didactics sub-course and school practice. The courses are integrated in that they have common descriptions of learning outcomes and combined exams where students are expected to display both pedagogical and subject didactic knowledge and link it to lessons learned from teaching experiences in schools. The main part of the PROF-courses is in the program's sixth and seventh term. They are centred around four main themes: 1) Teaching and learning, 2) Classroom environment and management, 3) Assessment of learning and 4) Adaptive teaching and differentiation. These themes are designed based on core practices outlined by Grossman et al. (2009b) to ground teacher education in practice and research which emphasizes coherence in teacher education (Darling-Hammond et al., 2005).

[1] Exphil is a mandatory course for all UiO students providing an introduction to basic philosophical questions about knowledge and ethics.

Foreign language student teachers have a total of 19 two-hour subject didactics lessons during the sixth and seventh term, of which 12 lessons take place in combined groups (French, German, and Spanish together) and 7 lessons take place in language-specific groups (French, German and Spanish separated). The Norwegian school system distinguishes between English, which is taught as a school subject beginning in the first grade, and other foreign languages, which are taught beginning in the eighth grade. This means that student teachers can combine English with French, German, or Spanish.

12.3.2 Observations and Discussions

Observations of a total of 10 combined lessons took place in spring and autumn in 2021. Two of the combined lessons as well as language-specific lessons were not included in the observations. The lessons in spring 2021 were digital lessons due to covid-19 restrictions. In the following, we describe the steps taken to collect the observational data for the study.

Step 1. Author 2 observed author 1's lessons after having been introduced to the students. As an observer, author 2 was present in the classroom, either behind a black screen in digital sessions or sitting in a non-interfering spot in the physical classroom. She did not participate in any activities, nor did she interact with the students. She took notes with specific attention to representations of core practices and how such core practices are decomposed into constituent parts and moves for the purpose of teaching and learning.

Figure 1 gives an overview of the Teaching Works' High Leverage Practices of The University of Michigan[2] we used as a starting point in her observations which is described in detail in the appendix in "Teaching core practices in teacher education" edited by Grossman (2018, p. 164–169).

For instance, one core practice that we have identified is facilitating a safe learning environment so that all students are willing to speak. An example move can be using IGP (individual-group-plenary) activities.

Step 2. After each observed lesson, author 1 and 2 sat down to discuss the lesson from a core practice perspective. Discussions were pre-structured, i.e. they would start by author 1 asking the author 2 which core practices she had observed. Author 2 used the high leverages practices list from The University of Michigan (see Fig. 1 above) as a framework to structure her observations and comments. In UiO's teacher education program, pedagogy and subject didactics teachers

[2] https://www.teachingworks.org/work-of-teaching/high-leverage-practices

Box 1. Teaching Works' High Leverage Practices of The University of Michigan.

1. Leading a group discussion
2. Explaining and modelling content, practices, and strategies
3. Eliciting and interpreting student thinking
4. Diagnosing particular common patterns of student thinking and development in a subject-matter domain
5. Implementing norms and routines for classroom discourse and work
6. Coordinating and adjusting instruction during a lesson
7. Specifying and reinforcing productive student behaviour
8. Implementing organizational routines
9. Setting up and managing small group work
10. Building respectful relationships with students
11. Talking about a student with parents or other caregivers
12. Learning about students' cultural, religious, family, intellectual, and personal experiences and resources for use in instruction
13. Setting long- and short-term learning goals for students
14. Designing single lessons and sequences of lessons
15. Checking student understanding during and at the conclusion of lessons
16. Selecting and designing formal assessments of student learning
17. Interpreting the results of student work, including routine assignments, quizzes, tests, projects, and standardized assessments
18. Providing oral and written feedback to students
19. Analysing instruction for the purpose of improving it

Fig. 1 Teaching works' high leverage practices of the University of Michigan

contribute at an equal level. To maintain this equality in our endeavour, we discussed this aspect before the first observation session, and we agreed to refrain from criticizing each other's teaching but to be open for constructive feedback. This "could have, not should have" approach proved to be fruitful and resulted in an active quest for the mutual anchoring of pedagogy and foreign language subject didactics topics.

Step 3. After our first post-lesson discussion session, where meta-discussions appeared as a topic of interest, we decided that author 2 also would take notes on how author 1 is meta-discussing how the various learning activities that the student teachers encounter could be transferred to their own teaching. This includes possible differences between the learning contexts.

Step 4. After the last observation-discussion sequence had been completed, we identified core teaching practices as well as overlapping themes between the

lectures and seminars of foreign language didactics and pedagogy, i.e. we looked for structural coherence between different components taught on campus.

12.3.3 Findings

In the following we will highlight three main findings based on the observations and discussions. These findings are: a) As a pedagogy teacher, author 2 gained detailed insight into topics and methods in foreign language didactics; b) As a foreign language didactics teacher, author 1 gained insight into the way he uses and talks about core practices in his own teaching and how his teaching can be related to theories and concepts discussed in pedagogy; c) The observation has had a direct impact on author 1's teaching by means of increased meta-discussions related to core practices.

Finding a) Gained Insight into Foreign Language Didactics
The first main finding from our study concerns the insights gained by the pedagogy teacher (author 2). At UiO, pedagogy experts teach their courses in mixed groups including student teachers in a variety of school subjects, amongst those foreign languages. Pedagogy courses are taught in relation to the four main themes mentioned above. Pedagogy teachers are not expected to have expert knowledge in one or more school subjects, which can make it difficult for them to relate to student teachers struggling to grasp theories and concepts without being able to relate to the subjects they study. By observing and discussing 10 foreign language didactics lessons, the pedagogy teacher gained insights on two levels.

Firstly, she learned how the didactics teachers create a match between the main topics and topics specifically relevant for the school subject. The foreign language curriculum (Utdanningsdirektoratet, 2019) for schools is clearly linked to the Common European Framework of Reference for Languages (CEFR; Council of Europe, 2020). This means that the school subject has its focus on communicative competence (cf. Canale & Swain, 1980). Thus, the question of how a teacher can contribute to students' communicative competence in French, German, or Spanish plays a major role in foreign language didactics in both the sixth and seventh term. This means that student teachers mainly discuss teaching and learning, assessment, and adaptive teaching from a communicative perspective: How can we create a classroom environment where students are willing to speak? How do you read a text without knowing all the words? How to teach a class with large differences when it comes to students' communicative skills in the language? How many grammar errors should we correct when students write a text? etc.

Secondly, the pedagogy teacher also experienced how theories and concepts from the pedagogical literature are "translated" into the didactics of a specific subject. One example is motivational theory being relevant at three different levels in foreign language didactics, i.e. classroom students' motivation for choosing to learn a particular language in school, their motivation to participate in different activities such as classroom presentations or group work as well as motivational aspects of (formative) feedback on students' language work. Another topic that appeared in our discussions concerned learning strategies, which are—as a result of communication being at the heart of the school subject—closely linked to strategies for reading, listening, etc.

Finding b) Gained Insight into Core Practices and Pedagogical Theories and Concepts

Like the pedagogy teacher, the foreign language didactics teacher gained new insights that can be valuable for more closely linking his course to other parts of teacher education. Firstly, the discussions after the observed sessions showed how subject-specific theories and concepts fit both with the overarching themes of the program but also with theories and concepts discussed in pedagogy classes, e.g. motivation and learning strategies (see Finding a). Another example is the connection that was made between foreign language didactics and the over-all, statutory adaptive teaching principle, which is introduced to the student teachers in the pedagogy course and then concretized by means of differentiation strategies in the didactics course. This topic was discussed in the first lesson after the students' school practice in the seventh term. The discussion after the lesson made clear that pedagogy and didactics are co-dependent when it comes to teaching both the fundamental and the practical aspects of this principle. Secondly, author 2's observations brought to the surface the fact that author 1's teaching practices matched well with the core practices listed by The University of Michigan (see Fig. 1). Thus, the subject didactics teacher's teaching could, in principle, serve as a model for his student teachers.

In order to provide the observer with as "normal" teaching as possible, the subject didactics teacher chose not to study the aforementioned list before the first observed lesson. Instead, he concentrated on adapting the lesson, that was announced as an "Introduction to foreign languages as a school subject", to the fact that the teaching had to be digital due to covid-19 restrictions. The lesson started with some remarks on the covid-19 situation, which at this point was taking its toll on the students. These remarks can be seen as a first step in building respectful relations (core practice no. 10). After this, the goal of the lesson was presented and put into a larger perspective, i.e. linked to communicative competence being the main goal of the school subject

(practice no. 13, setting short-term and long-term goals). The didactics teacher also mentioned that he would try to build-in practical activities that might be transferred to their own teaching practice once they have their school practice. This comment points out to the student teachers that one goal of the lessons is to [explain and] model [content,] practices [and strategies] (practice no. 2), however, without making the modelling aspect clear by decomposing specific aspects, like the lesson start, into its constituent parts.

After this, the student teachers were asked to think about their own motivation for language learning. The starting point for this activity was a list of demands placed on foreign language teachers described in a text students had to read in advance (Bjørke & Haukås, 2020). Student teachers were told to turn off their mic and video and to change their names to their favourite colour for them to feel free to write whatever they had on their minds in the chat (practice no. 10) before they were asked to write for two minutes without stopping about why they find languages important. After the two minutes had passed, the teacher educator asked everybody to send their texts in the chat before they returned to the screen with their full name. Based on the input from the student teachers, the teacher then led a plenary discussion (practice no. 1, leading a group discussion) where he continued to invest in good relations by acknowledging all contributions (practice no. 10). This activity served several purposes. Firstly, student teachers got accustomed with routines for the classroom (participating with full name and video; practice no. 5 and 8). Secondly, they were invited to participate in an activity that was designed to elicit their thinking, first in writing and then in speaking (practice no. 3 and 7).

In order to shift student teachers' focus towards the school setting, they were then asked to join predefined groups in break-out rooms to discuss why they think language learning is important for 13-year-old students. They were asked to come back to the main room after 15 minutes with a poster presenting good reasons for learning a new language. This activity can be linked to practice no. 12 (learning about students) and practice no. 9 (setting up group work) and at the same time it gives students the possibility to get to know each other in smaller groups (practice no. 10). After a short plenary discussion, the didactics teacher explained the build-up of the lesson by relating back to the goal set for the lesson and the format and function of the activities at hand. By relating back to the IGP principle, he also connected didactics to pedagogy. By doing so, the modelling aspect (practice no. 2) was made explicit, and the student teachers were able to relate transferable activities to lesson design principles (practice no. 14).

Throughout the sixth term, the observed foreign language didactics lessons continued along the same line, connecting snippets of theory with activities and group/plenary discussions. Thus, most core practices were present several times during

the term, giving students ample opportunity to reflect on their own teaching through a modelling lens. During the seventh term, the focus shifted from the fundamental principles of the communicative approach to foreign language teaching towards assessment and adaptive teaching and differentiation, which is an important principle in Norwegian schools. In addition to these overarching themes, foreign language didactics also focused on linguistic and intercultural competence. As a logical consequence of this thematic shift, the student teachers' attention was drawn towards core practices such as no. 17 (interpreting results of students' work) and no. 18 (providing feedback) in the foreign language didactics lessons observed and discussed. These core practices were also discussed, decomposed, and practiced in the language-specific lessons that weren't observed. In addition, the students analysed each other's teaching and provided each other with oral feedback (practice no. 18 and 19) in a micro-teaching session before their school practice in the sixth term. This session was not observed as a part of the study.

Finding c) Increased Meta-Discussion in Foreign Language Didactics

As a consequence of the iterative nature of the observation and discussion sequences, we had to consider that our discussions would reflect in the planning and implementation of the following lessons. We find such an effect related to the aspect of meta-discussion. As mentioned above, this aspect was one of the topics brought up by author 2, the pedagogy teacher, in the discussion after the first observed lesson as she commented on the fact that author 1, the didactics teacher, taught very much in accordance with the core teaching practices list she used to structure her observations but that he did not comment on these practices from a meta-perspective. Thus, students were subjected to modelling without necessarily being aware of "how to look and what they should be looking for" to be able to use the model to decompose activities and approach their own practice based on the elements that are implicit in teaching. The pedagogy teacher mentioned this possibility once more after the second lesson, and as a result of the comment and the discussion, the foreign language didactics teacher started to change his teaching by including a meta-perspective on several occasions throughout the sixth and seventh term. As an example of this changed practice, the last lesson in the observed lesson series was partly built around an open-end task where student teachers worked in groups to make a short presentation about the topics that had been discussed during the semester. Each group was working on a separate topic, making the class dependent on each other for their learning. Both before and after the group work, the didactics teacher commented on several aspects of the activity at hand, giving the students the opportunity to participate in a meta-discussion about several components of foreign language teaching.

12.4 Discussion and Concluding Remarks

The starting point for the study presented here was a shared collegial interest in finding ways to strengthen the coherence between pedagogy and foreign language didactics in a 5-year teacher education program. Thus, the measure we tried out should benefit both participants. As findings a-c presented above show, the observations and following discussions did contribute to gained insights for both participants. The findings also indicate that the described cooperative model for joint teacher educator competence development, using core practices as a framework, may facilitate peer-learning among colleagues and increase the individual educator's knowledge of other parts of the program beyond what they themselves teach and thereby affect the likelihood of promoting conceptual and structural coherence within the program. Conceptual coherence implies shared visions of good teaching among teacher educators; structural coherence concerns designing the various components, i.e. courses on campus and practice periods in schools, in the program so that they build on each other and can reinforce each other (Hammerness, 2006).

A program that is conceptually and structurally coherent implies that different actors can "identify the central ideas that undergird the program across course syllabi, reading lists, and main assignments" (Klette & Hammerness, 2016, p. 29). However, the core of the coherence problem is the extent to which student teachers perceive the study program as coherent (Canrinus et al., 2017). We argue that student teachers' perceptions of educational content and demands as to it being comprehensible, manageable, and meaningful are the core components of sensing coherence in teacher education (Hatlevik & Havnes, 2017; Lejonberg & Hatlevik, 2022). Design principles related to student teachers' sense of coherence entails facilitating students to be able to 1) perceive the content of the education as understandable, structured and coherent (comprehensibility), 2) have confidence that they have sufficient resources alone or in cooperation with others to manage and master the requirements of education and later professional practice (manageability), and 3) perceive the content of the education as meaningful, relevant and useful for professional practice as a schoolteacher (meaningfulness). The last element, meaningfulness, is in line with what according to Grimen (2008) can serve as an integrating element in professional programs, namely that the different parts of the program in various ways are relevant to professional practice. For this reason, it is important that future research also includes newly educated teachers who can reflect on the different components of teacher education from a professional perspective (cf. the contributions from Carrai & Hatlevik and Doetjes & Zaki in this volume).

Our study examines practice-related teaching practices in teacher education, which research literature has highlighted the need for (Cochran-Smith et al., 2016; Haugan, 2011; Jenset et al., 2018). We have shown that an observation-based cooperation between a pedagogy and a foreign language didactics teacher can be mutually beneficial, i.e. both participants gained insights that can lead to strengthened ties between pedagogy and didactics (sub)courses. Based on our findings, we expect that such a cooperation might serve as a manageable and cost-effective model for cooperation between a) pedagogy teachers and other subject didactics teacher; b) between academic subject teachers and subject didactics teacher and c) between pedagogy and/or subject didactics teachers and schoolteachers. Observations could take place in both directions. As a first step in an observation-based cooperation linking different domains in teacher education as well as linking teacher education with schools, we propose that the participants discuss whether they would use the core practices list as the starting point for their practice-based research or if other sources, e.g. the subject curriculum could serve as an alternative starting point. We would like to underline that an important prerequisite for the model is the allocation of sufficient time resources. We would also like to point out the need of follow-up studies amongst students and newly educated teachers: Does their sense of coherence increase because of cooperative actions undertaken by teacher educators seeking to strengthen program (conceptual and structural) coherence?

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13 Coherence through Cultures of Remembrance? A Design-Based Research Project at the Intersection of Literary Studies, Subject Didactics and School Practice

Frank Reiser and Katja Zaki

Abstract

Teacher education programs often lack opportunities for future teachers to develop networked knowledge structures by integrating knowledge from different fields. This article presents a design based research project that aims to link different domains of professional knowledge and enhance transferability to school practice in the form of an integrated seminar for student teachers of Spanish as a foreign language. The course combines team-teaching units with individual and collaborative problem-based learning tasks to promote co-constructive knowledge integration. Initial evaluation results indicate significant effects in terms of coherence construction and perception among students, but also reveal challenges and limitations of the integrated format (e.g., an above-average workload). Furthermore, fostering course coherence draws attention to other components of the teacher education program. On the one hand, integrating domains requires transparency about the knowledge acquired in previous courses, on the other hand, the creation of meaningful tasks implies matching them to the realities of professional practice in school.

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As initial surveys have shown, the implied tasks and related fostering of coherence result in a potentially fruitful but also tense relationship with university studies.

Keywords

Foreign Language Teacher Education • Sense of coherence • Instructional design • Design Based Research • 4C/ID • OER

13.1 Introduction

In order to provide a solid foundation for high-quality school education, discussions regarding what constitutes effective teacher education (TE) have always depended on different perspectives on 'teaching competencies'. This includes the questions of how teachers should 'be', what they should 'know', what they should 'be able to do' (as well as which of the mentioned facets should be in the foreground—personality formation, certain behaviours and activities, or professional knowledge and expertise?). Furthermore, it also implies considerations about where and how teachers may acquire the corresponding competence facets in the first place.

In this context, "professional competencies" are often defined as cognitive facets, i.e. professional knowledge in the domains of subject sciences, subject didactics and educational sciences, but also personal beliefs about professional practice as well as attitudinal-motivational and self-regulatory aspects, which are influenced by personal dispositions that are seen as dynamic and able to be developed (Voss, 2021; König, 2014). In order to develop these professional competencies and to teach successfully, prospective foreign language teachers must be able to connect subject-specific knowledge, subject-specific didactic knowledge and educational professional knowledge as well as retrieve such in practical school situations (Gruber, Mandl, & Renkl, 2000).

Against this background, one of the main criticisms of the German teacher education system has been that the historically evolved teacher training programs often produce segregated and inert knowledge, contain (double) discontinuities between training phases, do not adapt examination models to training phases, and, consequently, only meet the complex requirements of the teaching profession to a limited extent (Terhart, 2004). The knowledge acquired in this way is later difficult to integrate, cannot be applied adaptively in different contexts, and is therefore only conditionally effective for action (e.g. Blömeke, 2006; Gruber, Mandl, & Renkl, 2000).

Addressing the desiderata outlined above, a variety of federal- and state-funded programs have been launched in recent decades to achieve greater interlinking of the study programs that are so often perceived as fragmented. This included curricular revisions—or, where such revisions were accompanied by far-reaching educational policy reforms such as in Baden-Württemberg, curricula was also rewritten—and the launch of teaching development programs and *design-based research projects.* However, creating *effective* coherence throughout these teaching offerings can not only be viewed on the supply side of things, it always remains an individual task which the students themselves must undertake. Against this background, this article outlines a teaching development project (Integrated Master's Seminar, IMS) that was implemented in the context of the Baden-Württemberg teaching reform of 2015. After an introductory sketch of the theoretical foundations and the context of secondary-school teacher education in Freiburg, the article discusses the instructional foundations, the implementation cycles and the initial evaluation results of the course.

13.2 Theoretical Foundations: Coherence in (Language) Teacher Education

13.2.1 General Observations

When hearing the term "coherence", university educators might not immediately think of a design principle of study programs. This term's application to the structure and concept of study programs, used across various fields like law, medical, and teacher education, emerged in the mid-twentieth century within Anglo-Saxon curriculum research (Buchman & Floden, 1991). Early coherence-oriented approaches promoted more interrelated study parts to address discontinuities and fragmentations. Over time, more precise categorizations have been proposed.

Levels and Focuses

Coherence in teacher education can address several levels and discontinuities (Canrinus, 2015; Hammerness, 2006):

- Coherence between different *phases* of teacher education: The term 'phase' can be used to refer to larger sections of study (such as the Bachelor's and Master's phases), but also to the consecution between individual courses or learning opportunities in the sense of a structured progression; within a discipline or

sub-discipline, we use the term *vertical coherence* (for example, between an introductory linguistics course and a linguistics seminar in a master's degree).

- Coherence between *domains* of professional knowledge (subject sciences, subject didactics, pedagogy) and sub-disciplines (literary studies, cultural studies, linguistics, language practice) as well as between these and school practice components; this 'interdisciplinary' link is referred to as *horizontal coherence*. It can coexist with vertical coherence, for example when a subject didactics course in the second year of study is explicitly linked to a basic pedagogical course from the first year.
- Coherence/correspondence between *university disciplines* and their respective *school subjects* (Klieme et al., 2003; Nordine et al., 2021); there may be a difference that goes beyond the mere level of difficulty, e.g. in terms of methods, epistemological foundations and/or objects of study. This factor is a central point in the issue of the profession orientation of university studies, with institutional aspects playing a crucial role (self-conception of the universities and the academic disciplines, educational ideals, etc.).
- Coherence/cooperation between different *agents* and *institutions*, which, depending on the teacher education system, can coincide with the levels mentioned above. For instance, different domains (e.g. subject sciences and subject didactics) might be managed by actors within different departments or various TE phases might take place at different higher education institutions (such as in Germany).

Program Coherence—An Interactive Process Rather Than a State?

When focusing on particular coherence-oriented arrangements and activities to interlink study components and domains of professional knowledge, we can further distinguish between a comparatively supply- and a reception-orientated side. For the supply-side, in turn, there also exists *macro-meso-micro levels of action*, with the macro level referring to the overall curriculum development and shared visions of teaching and learning within educational institutions, the meso level to the structure of study programs within individual disciplines, and the micro level to the individual courses and learning opportunities (Fig. 1).

Coherence in teacher education often focuses on the analysis and description of curricular structures and teaching–learning-opportunities (supply side) that should enable students to experience their studies as coherent and meaningful (reception). In this context, the focus is on 'intended' forms of program coherence; however, only an examination of their application in concrete teaching-and-learning practices reveals if and how they are *implemented* and, possibly, if their original objectives are *achieved*. Often, the effects of the implemented measures are difficult to grasp (or

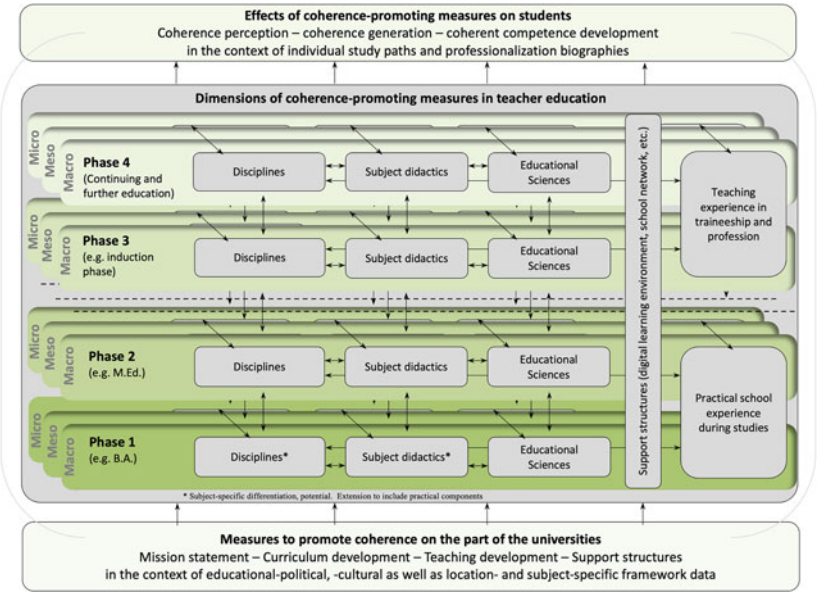


Fig. 1 Freiburg domain-phase-model (adapted from Hellmann et al., 2018)

even to measure) and require a holistic, context-sensitive view. Recent approaches thus define coherence less as a state than as a co-constructive process (Hammerness, 2006; Nordine et al., 2021) and emphasize a process and actor related approach that looks at not only the role(s) of teacher educators and the associated stakeholders as process partners but also the effects on the student side and related individual learner variables.

Integrative supply-use models (*Angebot-Nutzungs-Modell*; cf. Joos et al., 2019; Helmke, 2012) suggest that teacher education is a complex system involving structures, processes, and stakeholders, that impact effective educational resource utilization. The model emphasizes that learning success relies not only on traditionally focused institutional and structural elements (curricula, institutional policies, teaching quality) but also on the interaction among stakeholders and the way students receive offerings and processes. Personal factors, including cognitive, attitudinal, and motivational variables, affect how similar offerings are received differently.

Coherence as Perception ('Sense of Coherence'?)

As Canrinus and colleagues pointed out, "[a]lthough teacher educators may perceive their program and courses to be coherent, the question remains to what extent student teachers also are able to perceive the linkages within their programs" (Canrinus et al., 2017). *Intended* and even *implemented* coherence does not necessarily imply that this coherence will be *achieved* on the learners' side. When defining achieved coherence, it is important to differentiate between coherence 'perceived' *(sense of coherence*) and coherence 'generated' by students (*knowledge integration, ability to establish the connection between different study components*).

The salutogenetic model of coherence perception considers students' holistic experiences of their studies, encompassing cognitive *comprehensibility* and individually perceived *meaningfulness* and *manageability* (Joos et al., 2019; Antonovsky, 1997). These aspects are relevant for enhancing teachers' professional competencies through a more interconnected professional knowledge and professional identity development, involving professional beliefs and attitudinal, motivational, and self-regulatory facets.

13.2.2 Contexts and Concepts of Coherence in Foreign Language Teacher Education

In addition to general foundations, coherence-oriented programs hinge on the subject-specific modelling of professional knowledge subdisciplines and their roles and interactions in teaching activities (Ball et al., 2008; König, 2014).

Based on established models of professional knowledge (König, 2014; Shulman, 1987), which mostly stem from the field of mathematics, an adapted model for foreign language teacher education has taken into account the structuring of different sub-facets (e.g., as in the model on school-relevant PCK and CK of Ball et al., 2008 or the specification of PCK on different levels in teacher communities as in the "Refined Consensus Model [RCM]" by Nordine et al., 2021) and how they can be operationalized for foreign language teachers' competence and performance. Recently, exploratory studies on "subject-specific teacher competencies" of foreign language teachers (cf. Kirchhoff, 2017; Legutke et al., 2022; Schädlich, 2022) have been launched, accentuating specific aspects, such as the role of language practice. The latter constitutes a specific practical facet in addition to—or also as part of—the CK (i.e. literary, linguistic, cultural studies) and PCK components. Furthermore, unlike, for example, in the scientific-artistic subjects, language proficiency is not only one more component, but also a central

medium of instruction: Teaching French or Spanish is not solely *about* the foreign language, but is also usually held *in* the foreign language—with its different general, educational, or even technical language registers.

Moreover, profound shifts and re-accentuations in the weighting of different sub-disciplines can be seen in recent years. Educational science aspects such as inclusion have increasingly come to the fore in order to make the traditionally strongly subject-oriented courses of study more professionally oriented (de Florio-Hansen, 2015; Legutke & Schart, 2016). Furthermore, internal contouring of the sub-disciplines has also evolved, leading to an enhanced focus on cultural studies and a stronger differentiation in foreign language didactics as a research-oriented science due to empirical educational research influences.

Coherence orientation in FLTE should, therefore, coordinate theoretical foundations, curricular structures, modular objectives, instructional designs, and student roles. Concerning the latter, various concepts have been reviewed and systematized in research literature: For example, a common vision of teacher education within an institution is seen as a central foundation (e.g., Kennedy, 2006), as well as agreements regarding the improvement of the connection between theory and practice (Grossman et al., 2009; McDonald et al., 2013)—e.g. with so-called core practices as a common denominator (Forzani, 2014)—and also cross-disciplinary course designs. For some years now, a focus of coherence and professional orientation has been on teacher education development projects aiming to link different areas of professional knowledge and/or establish a link to school practice in an evidence-based approach (Darling-Hammond, 2006; Sandoval et al., 2020).

13.3 Context of (Language) Teacher Education in Freiburg

As different as the understandings of coherence orientation may be, they do not work in a vacuum, but rather are framed by historical, cultural, political and educational contexts. In the case of Germany, there are a number of particularities (see Symeonidis et al. in this volume), namely the federal structure (which grants each state far-reaching sovereignty with regard to the design of the educational system), the division of teacher training into two phases, the institutional differentiation according to different (secondary) school types and tracks, as well as the principle of compulsory study of at least two subjects in secondary school

teacher education with a strong focus on academic education. (For all school languages, linguistics, literary and cultural studies make up 60 to 70% of the study portions nationwide; cf. Legutke & Schart, 2016, 18).

These structures, some dating back to the eighteenth and nineteenth centuries (Klippel, 2018, 2022), highlight the challenges of implementing new approaches. Initially, teacher training was highly scientific, espousing a humanistic, educational ideal. Reform calls in the late nineteenth century (cf. Vietor, 1903) led to an induction phase integration focusing on professional practice while remaining institutionally and temporally separate from university studies. Over the twentieth century, educational science and research-based subject didactics were gradually incorporated into the initial phase. Significant changes to grammar school teaching profession frameworks and curricula occurred in the 1970s, having been influenced by discourses on professional theory and educational policy programs.

In recent years, post-PISA-shock in the 2000s led to publicly funded programs like the Quality Initiative for Teacher Education, which has been embraced differently by the 16 federal states. Some states maintained traditional structures and a State Teaching Exam, while others underwent major reforms, like Baden-Württemberg: In 2013, Baden-Württemberg's government initiated a comprehensive reform of its teacher education, replacing the undergraduate teacher training program and first state examination with a polyvalent Bachelor of Arts or Science (B.A./B.Sc.) and a Master of Education (M.Ed.) (RahmenVO-KM, 2015). This structural redesign also provided an opportunity to reshape existing models, module structures, and teaching concepts. However, despite the educational policy framework, the reform's implementation and design greatly differ by location and subject.

Reform of Teacher Training in Freiburg

In Freiburg, curricular reforms led to changes in content, concepts, organizational structures, and areas of responsibility. Now, Freiburg's TE programs feature a collaboration between the *University of Freiburg*, the *Freiburg University of Education*, and the *Freiburg University of Music*, each contributing their respective expertise. The university studies are followed by an induction phase at regional secondary schools under the supervision of the *State Department for Teacher Training and Continuing Education*. The multiplicity of phases and institutions is both an opportunity and challenge. To address this, the School of Education FACE was established, promoting convergence of perspectives and positioning TE as an academic studies and research field.

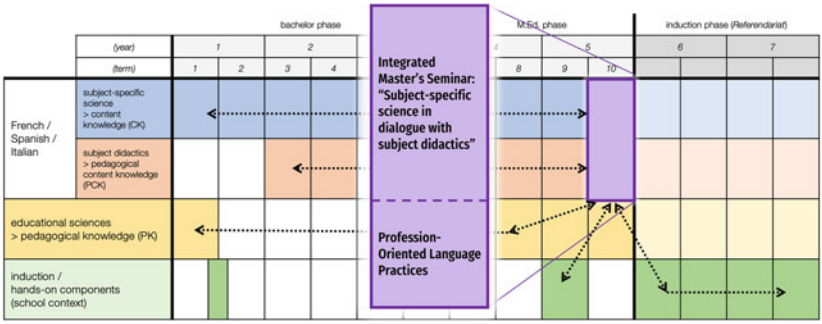


Fig. 2 The IMS in the context of the Freiburg M.Ed. in Romance Languages

The Reformed Teacher Education in Romance Languages

For the new TE program in Romance Languages (French, Spanish and Italian for the upper secondary level), particular emphasis was placed on the development, but also curricular anchoring of coherence-oriented concepts. Whereas in the bachelor's program a foundational knowledge in all domains is to be consolidated and is strengthened by linking formats *between* disciplines and courses (such as interdisciplinary learning tasks, cf. Nückles et al., 2019), the master's program contains more integrative structures, such as the so-called "Integrated Profession-Oriented Module". The latter consists of two complementary courses: "Integrated Master's Seminar: Subject-specific science in dialogue with subject didactics" and "Profession-Oriented Language Practices" (Fig. 2).

The interdisciplinary IMS provides students with the opportunity to analyze a defined school-relevant topic from the perspective of the subject-specific science and subject didactics (through co-teaching by lecturers from both disciplines). The course on "Profession-Oriented Language Practices", in turn, deals with work-related activities in the foreign language and is based on professional field-related language competence profiles and corresponding tasks (Egli Cuenat et al., 2016). Accordingly, the course aims, above all, to enable students to perform core teaching practices (Grossman et al., 2009) in the target language (e.g. explaining grammar, giving feedback) and to adapt these to different learner language levels, up to C1. Within the framework of the corresponding courses, the students draw on their previously acquired skills, in the sense of vertical and horizontal coherence, as well as on the knowledge acquired during their studies in educational science and subject didactics.

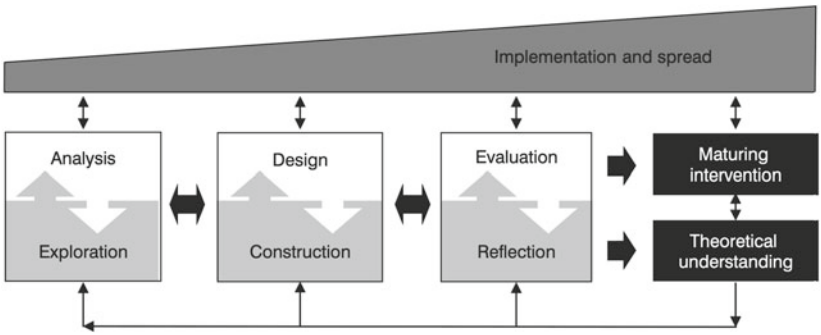


Fig. 3 Educational design research model (McKenney & Reeves, 2012, 77)[1]

13.4 Design Based Research Project "Cultures of Remembrance"

The implementation of the IMS aimed at developing and evaluating a coherent teaching concept; at the same time, the approach was meant to deliver findings and research results concerning the effectiveness of the format. Since there is hardly any solid evidence regarding the effectiveness of measures in this area (Legutke & Schart, 2016), it seemed reasonable to opt for a Design-Based-Research (DBR) setting, adopting and adapting established models (McKenney & Reeves, 2012; Prediger, Gravemeijer, & Confrey, 2015; Fig. 3).

DBR approaches are characterized by their double focus: The development of innovative 'interventions' to solve a practical problem (in this case: the design for an integrative seminar according to the 4C/ID model for the M.Ed.), as well as its implementation and evaluation with research interests. The classic separation of research and practice is thereby blurred.

The central question was how the seminar concept could contribute to an increase in the interlocking of subject sciences and subject didactics or the M.Ed. and the induction phase and thereby also strengthen the perception of coherence among students. The planning was based on Prediger's Dortmund Model with the following sub-aspects (Prediger et al., 2016):

[1] While McKenney & Reeves use the term Educational Design Research (EDR), in the rest of the article we prefer the term Design-Based-Research (DBR), which is more common in the German context.

- Analysis and exploration—specification and (pre-)structuring of the subject matter
- Conception and design development
- Design testing and evaluation
- Local theory building and further development

Accordingly, the approach consists of several iterative cycles, each of them followed by a subsequent revision of the underlying assumptions and a re-design of the initial approach.

13.4.1 Analysis and Exploration

For the initial implementation of the IMS, the topic "Memoria histórica. Memory Cultures in Spanish classes" was chosen in 2020. The first step in development consisted of the specification of the core course objectives (subject-specific as well as overarching educational goals) and the reconstruction of the subject matter, taking into account the (potentially conflictive) relationship between subject-scientific conception and students' pre- or misconceptions. Exploring the topic from an interdisciplinary angle, it was necessary to identify theories that are fundamental to understanding cultures of memory and their portrayal in literary texts and in other media in a differentiated way (in terms of content knowledge and its subdivisions, e.g. CCK/SCK (Ball et al., 2008)); as for possible misconceptions, there were no studies to build on, therefore, the students' preconceptions were collected in the first cycle of the seminar itself. In addition, the specific relevance of the topic for school contexts had to be determined: framework guidelines (national or regional), Spanish curricula, commonly used textbooks and journals on foreign language teaching were relevant. Regarding pre-conceptions, the assessment of framework papers was also insightful as, for instance, the categorization of *memoria histórica* in educational curricula and its treatment in textbooks sometimes revealed a narrow or misleading understanding of the concept (e.g. reducing cultures of memory to declarative knowledge about historical events).

Accordingly, the main question was how to teach *memoria histórica* to Spanish TE students in a way that is manageable, relates to their future profession, and activates their prior knowledge.

13.4.2 Design and Sequencing

Among internationally tested and evaluated concepts for profession-orientation in study programs, two approaches were of particular interest for the IMS design: The 4C/ID model and, as a structuring knot of the latter, the orientation by core practices of teaching.

The 4C/ID model is a problem-based approach to teaching and learning which comprises four key components: learning tasks, supportive information, procedural information, and part-task practice (Kirschner & van Merriënboer, 2007; van Merriënboer, 1997). Originally developed for medical studies for the solution of real-life problems, the principles of the model can be adapted for foreign language teacher education and partially overlaps with approaches to competence and task orientated foreign language teaching (cf. Bär, 2013; Reinfried, 2011). By developing cognitive sub-skills, which are gradually integrated into authentic learning tasks that become more complex, effective professional action knowledge should emerge, promoting performance-oriented competencies as opposed to 'inert' or fragmented knowledge (Gruber, Mandl, & Renkl, 2000; Blömeke & Laschke, 2014; Fig. 4).

According to our adaption of the 4C/ID model, the seminar was structured by a sequence of tasks, accompanied by supportive and procedural information as well as opportunities for part-task practice. The preparation of the course as well as its presentation began with the final real-life task: an integrative dossier of teaching concepts to be created in collaborative group work (with intermittent support from the lecturers; the *project phase*). Focusing on a piece of literature for potential use in the Spanish classroom, the dossier is theory-based (cultural and literary theory as well as subject didactics) and includes a justification of the text selection (from a pre-selected list), methodological considerations on potential learning goals (both subject-specific and transversal), practical applications, as well as supplementary material.

According to the 4C/ID model, this comprehensive final task is prepared in smaller task-oriented components which can be assigned to different task classes, which follow an increasingly interdisciplinary progression in which the thematic scope, format as well as the structural function to the project work is variable. Some tasks serve, for example, (1) to expand on theoretical foundations as conceptual knowledge in expert groups and micro-teaching units as part-task practice. Other learning tasks (2) focus on central activities of the project phase [e.g. the analytical analysis of literary texts from a subject-specific and subject-didactic perspective] or (3) aim at the creation of ready-made components of the final dossier. Improving the interdisciplinary congruence as well as the coherence

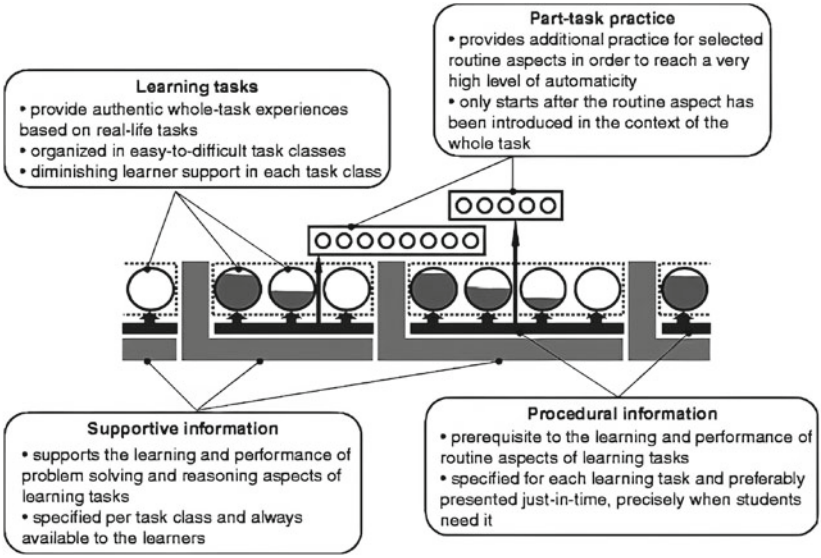


Fig. 4 The 4C/ID model (van Merriënboer, 1997)

between the preparatory tasks and the project phase has been a central focus between the cycles (see 4.3).

In this context, and for the task design in particular, the previously mentioned core practices act as important nodes of interconnectedness (between the domains of professional knowledge and as a theory–practice link). Core practices are general or subject-specific activities which teachers engage in to guide and support learning processes, such as "explaining concepts". They consist of strategies, routinized procedures, and sequences that have a structuring effect in the planning, diagnosis and implementation of lessons and are therefore increasingly in the focus of the first phase of teacher education as well.

The 'type-3' (according to the above categorisation) learning task *Explaining 'memoria histórica'* may illustrate this*:* Students are asked to create an audiovisual medium for a flipped-classroom setting in which the concept is to be explained to learners of a fictitious upper secondary Spanish class. For this purpose, student teachers should re-evaluate the key texts on cultural theory of collective memory and reduce this knowledge didactically; in addition, they have to structure the explanation in an appropriate way—activating prior knowledge

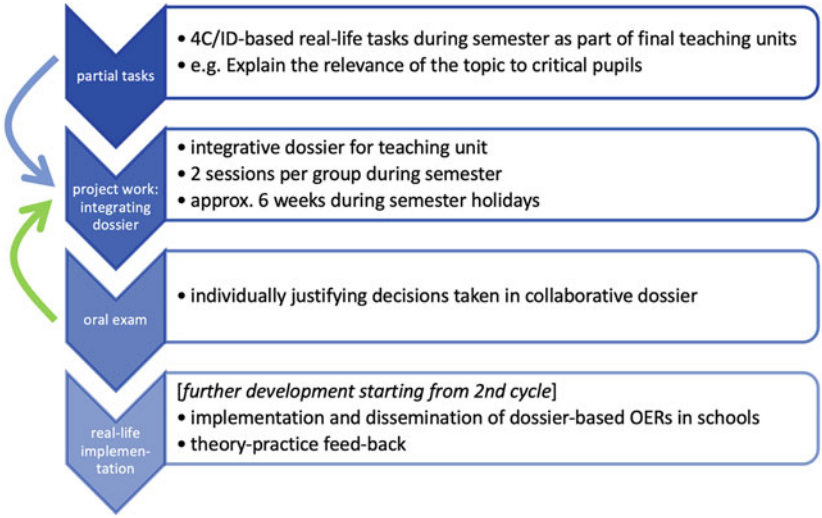


Fig. 5 Sequencing of the seminar

and following key principles of good explanation, such as principle orientation and cohesion, which the students have become acquainted with in pedagogical courses of the bachelor's phase. Ultimately, this learning task requires the actual production of the medium as a form of *part-task practice* with all its (linguistic as well as technical-medial) challenges. The media created is also a first component of the final dossier, which additionally increases the meaningfulness of the task.

In addition to the collaborative project work, the seminar concept also includes two additional coherence-creating mechanisms:

(1) The final twenty-minute oral exam stipulated in curricular regulations as an individual 'defense' of the group dossier. (2) The publication of the student dossiers in a revised form as *open educational resources* (OERs). (This component is still under development and meant to open the developed concepts to in-service teachers in Germany and beyond, thus increasing the meaningfulness of the project work[2]) (Fig. 5)

[2] First OERs, of the course concept itself as well as of students' work, can be viewed under the following link: https://www.face-freiburg.de/connected/io6-freiburg2-subject-sciences-and-subject-didaktics-in-dialogue/ [30.07.2023].

13.4.3 Piloting and Evaluation

The course concept was piloted in the summer term of 2020, when then first cohort of students of the reformed TE entered their final M.Ed. phase; to date, it has been followed by two more cycles in 2021 and 2022, each accompanied by evaluation measures. The latter comprised a general course evaluation, which entailed a survey focusing on the students' perception of coherence—both within the course and concerning their studies as a whole—as well as an exploratory qualitative analysis of students' learning tasks. Thus, starting with the overall objective to reduce discontinuities—structural or perceived—and strengthen both the coherence between CK and PCK as well as the theory–practice link, the following questions framed the first implementation cycles and their evaluation:

- General question: (How) can the seminar format contribute to the intended curricular coherence, modelling the latter as a combination of cognitive, affective/motivational and conative aspects (comprehensibility, manageability, meaningfulness)?
- Focus 1: Students' perception of coherence (instrument: course-related evaluation focusing on course design, perception of individual involvement, relevance for future profession etc. (general coherence survey, KoLaRom2021)).
- Focus 2: Knowledge integration and competence development as displayed in students' tasks (instrument: exploratory qualitative content analysis of tasks).
- Focus 3 (2^{nd} cycle and ongoing): Potentials for cross-phase coherence, linking university studies and induction phase/training for in-service teachers.

Due to the Corona pandemic, the 2020 cycle was adapted to a virtual setting, while maintaining the main design elements—task-based 4C/ID model, tandem teaching, core practices –, but changing its implementation: The course work was coordinated via the university learning platform (ILIAS). There were instructional videos, weekly classes offered via Zoom and the students were encouraged to organize themselves for collaborative tasks. According to the summative course evaluation, however, the virtual setting was considered only a minor obstacle. Students reported to be generally satisfied with the experimental approach of a co-taught seminar connecting the subject science and subject didactics. However, they perceived the interdisciplinary implementation as partly too imbalanced; moreover, they commented that the workload was too high, alluding to an essential component of coherence, the felt (un-)manageability of the program. The evaluation results provided impulses for the further development for the 2021

cycle, emphasizing, among others, the need for a more integrative, profession-oriented approach as well as the need for more individual manageability and meaningfulness.

Accordingly, the 2021 cycle showed some substantial changes: Although many pandemic-related restrictions were still in place, the course could be held in a hybrid format (with virtual input lectures for 'supportive information' and face-to-face meetings for the project work in smaller groups). This increased the dialogical format of the co-teaching approach as well as the collaborative work among the students. Furthermore, the workload was reduced and collaborative approaches (including peer feedback structures) were intensified, i.e. learning tasks, part-time-practices as well as the final dossier. Furthermore, the aspects of meaningfulness and profession-orientation were emphasized by introducing students to OERs and offering them the opportunity to literally 'open' their work for the wider public, i.e. to disseminate them among teachers. As the evaluation showed, the students of the second cycle were also satisfied with the course and increasingly saw the meaningfulness of the approach and the topic for their future work; nonetheless, the levels of perceived manageability did not improve. Here, a fundamental target conflict became apparent: the challenge of balancing an increased meaningfulness and practice focus on the one hand and manageability against the background of limited working capacity (and awarded ECTS credits) on the other (Fig. 6).

In the summer term of 2022, the course was completely held as a face-to-face-seminar for the first time. It integrated the impulses of the first two cycles as well as peer feedback from colleagues working on similar formats in TE programmes at the local and national level as well as internationally in the context of the ConnEcTEd project.

In this cycle, some smaller adaptions in the course design were implemented, for example, the restriction of the eligible project texts to one cultural and historical context—Chilean novels commemorating the Pinochet era—which enabled a more efficient thematic focus (e.g. socio-cultural background knowledge) and increased thematic coherence in the course design. Furthermore, cooperations with representatives from schools and school authorities were intensified in order to sound out the conditions for an increased connection and cooperation between theory and practice.

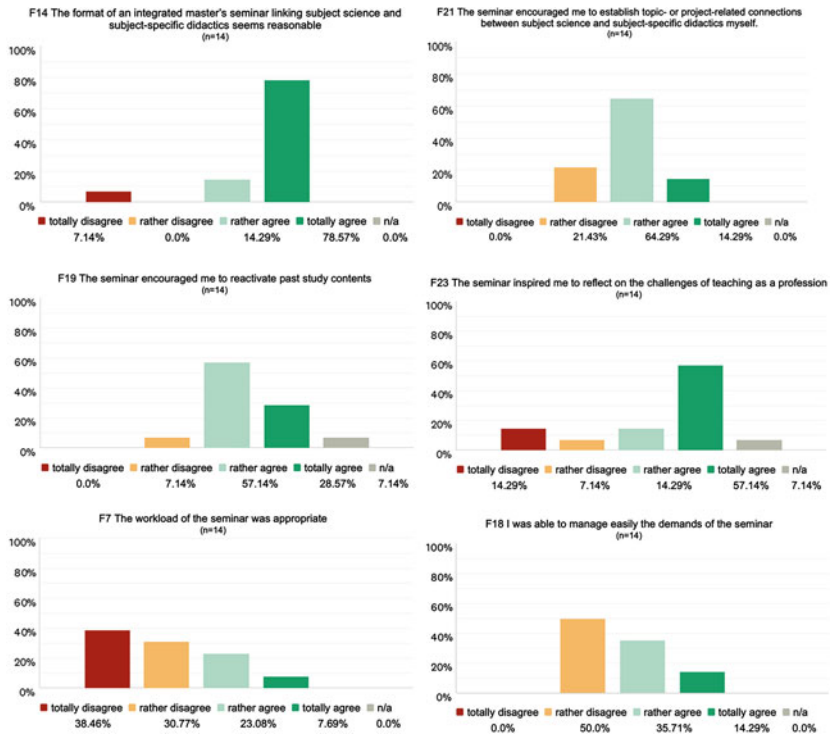


Fig. 6 Course evaluation results (2021 cycle)

13.4.4 Preliminary Findings

The evaluations of the first three cycles all showed a generally positive feedback regarding the developed seminar concept, including its format as well as its topic, and—with some limitations—its co-taught and task-based instructional design. In all three cycles, the comprehensibility, the perceived connections between the domains involved and the perceived connections to previous contents of the study program were all assessed rather positively.

However, the results also emphasized certain challenges, with the conflicting imperatives of meaningfulness versus manageability being the core problems. As different adaptions during the course cycles showed, the limited manageability was not only the result of the workload itself, but also of a discrepancy between

the real and the expected prior knowledge of the students: Knowledge from previous courses, which course instructors assumed was present and served as a foundation for the course's design, was only partly cognitively available (if at all). This underlined one of the general findings: Coherence in a wider sense can hardly be achieved in or by punctual course projects, but instead is context sensitive and requires an integrative approach not only at the micro level but also on the meso-level of the TE program, be it through a collaboratively planned and implemented curriculum or a joint vision.

Another challenge to the manageability was seen in the conflicting interrelations of the objective of meaningfulness. In order to increase the professional relevance, the practice-orientation of the course design was continually reflected upon in different ways: By contextualizing the learning tasks in real-life-settings, by opening up the possibility to publish course work as an open educational resource as well as, on the structural level, by intensifying the communication and cooperation with school representatives. The latter did not only help to optimize the course content, but also to extend the perspective of this pre-service university course to include offers for in-service teachers. Once again, fostering coherence transcends the individual course project and stresses the view that practice- or profession-orientation should not be seen as a one-way-street, but a synergetic dialogue, aiming at both the integration of practical perspectives within the university setting as well as the integration of new theoretical findings and approaches in school practice (Fig. 7).

13.4.5 Further Implications and Complementary Steps

As our findings emphasized the importance of taking the larger context into account, additional measures were taken to complement the course-based evaluations.

Survey Among Teacher Students in Romance Languages (KoLaRom21)
In order to contextualize the course-based evaluation results in students' general perceptions of their local TE program, an online survey "coherence in romance languages TE" was launched in 2021. For the survey, items from Blömeke (2006) and Canrinus et al. (2015) were adopted and adapted, leading to an online survey with 18 items, following a 4-point-Likert scale, and was partially complemented by open questions. After the pilot, 76 students of the Master of Education in Romance Language participated (French n = 35, Spanish n = 30, Italian n = 5, combined French and Spanish n = 6), among them the cohort of the IMS (Fig. 8).

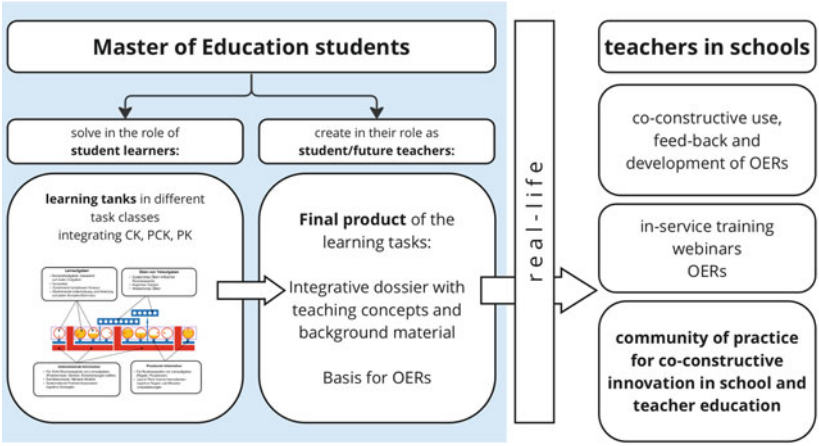
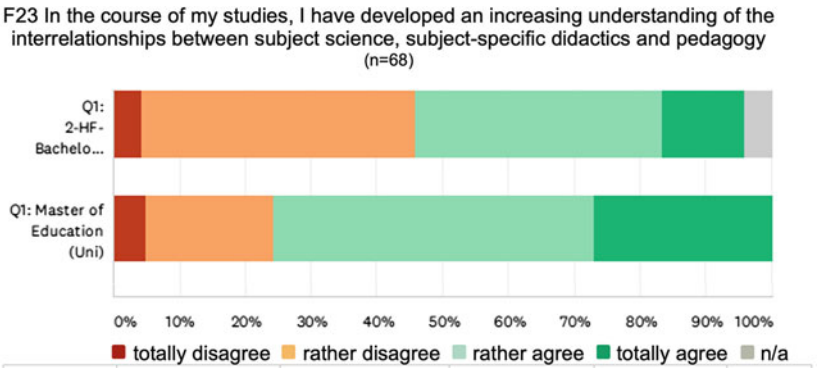


Fig. 7 Principles for further linking theory and practice

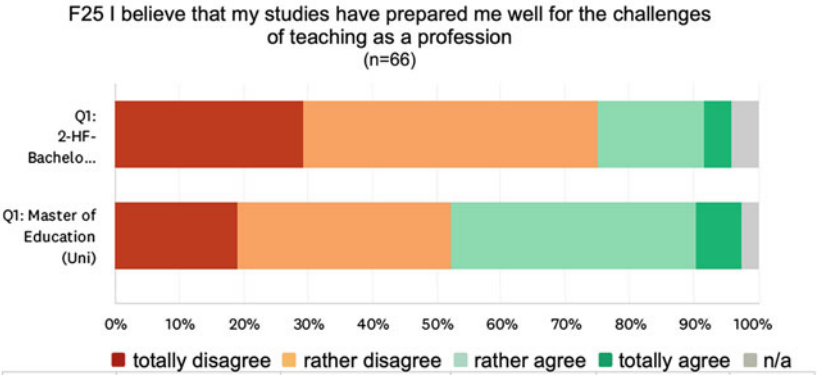
Concerning the general impression of the study program, the Spanish teacher students reported an increasing perception of (horizontal) coherence throughout the course of their studies. In the bachelor phase, this mainly consisted of perceived coherence between subject didactics and pedagogy. For the Master of Education, teacher students increasingly perceived coherence between subject didactics and subject science (F23). However, a comparatively low, yet over time increasing, level of connectedness between theory and practice (F25) was also perceived. In this context, a demand for more specific, profession-oriented courses was expressed. In the open questions, students were invited to identify existing good practice examples of coherence. The IMS was positively commented on several times. These comments were given several months after the last cycle, i.e. they were detached from the direct after-effects of the course. A similar survey will be conducted again in one of the following cycles, aiming to further track perceptions of coherence over time, and importantly, to gather more data from graduates evaluating the program retrospectively and from the perspective of their actual teaching practices. (Due to the relatively short period of time since the beginning of the reform, there were inevitably very few responses [n = 3] from the group from 2021.)

Survey Among In-Service Teachers of Spanish

As mentioned above, we planned to further develop the dossiers into materials for use in real school context. In addition to increasing the meaningfulness of the dossier



	totally disagree	rather disagree	rather agree	totally agree	n/a
B.A. (n=24)	4.17%	41.67%	37.5%	12.5%	4.17%
M.Ed. (n=41)	4.88%	19.51%	48.78%	26.83%	0.0%



	totally disagree	rather disagree	rather agree	totally agree	n/a
B.A. (n=24)	29.17%	45.83%	16.67%	4.17%	4.17%
M.Ed. (n=42)	19.05%	33.33%	38.10%	7.14%	2.38%

Fig. 8 Selected results from 2021 survey among teacher students in romance languages

work, this idea is meant to serve as a vector of feedback and exchange between the initial authors (i.e. the IMS students) and experienced in-service teachers, with the aim of establishing *communities of practice* beyond even the concrete topic. But how would materials have to be themed, to be designed, to be published or hosted, so that teachers and teacher mentors would use them? What other ways of disseminating thematic content would be promising—advanced face-to-face or

virtual training offers? In order to get an orientation on these questions, a second survey was launched in 2021, this time targeting the group of in-service Spanish teachers in Baden-Württemberg and Bavaria (n = 79 [69 + 10]) and comprising a set of 20 items following a 4-point-Likert scale, complemented by semi-open supplementary questions on the preconceptions, professional knowledge, attitudes and concrete practices concerning cultures of remembrance (Fig. 9).

As a central finding, it can be stated that the topic of *memoria histórica* is considered important by Spanish teachers in schools, although their prior knowledge and associations with the topic are quite diverse. Some report to have little knowledge of relevant papers beyond the ministerial education plan (F10) and of core cultural theoretical foundations (F11). Most teachers report that their prior knowledge comes from individual readings (F12, F21), rather than university input or in-service training. Such offers seem to be desirable for the majority of teachers, but they have diverse demands, with many requesting quick, ready-to-use materials to minimize preparation time. However, this conflicts with the comprehensive and integrative approach of the IMS and the student dossiers. A possible solution (and challenge) could be to create modular OERs that enable adaptable, flexible use

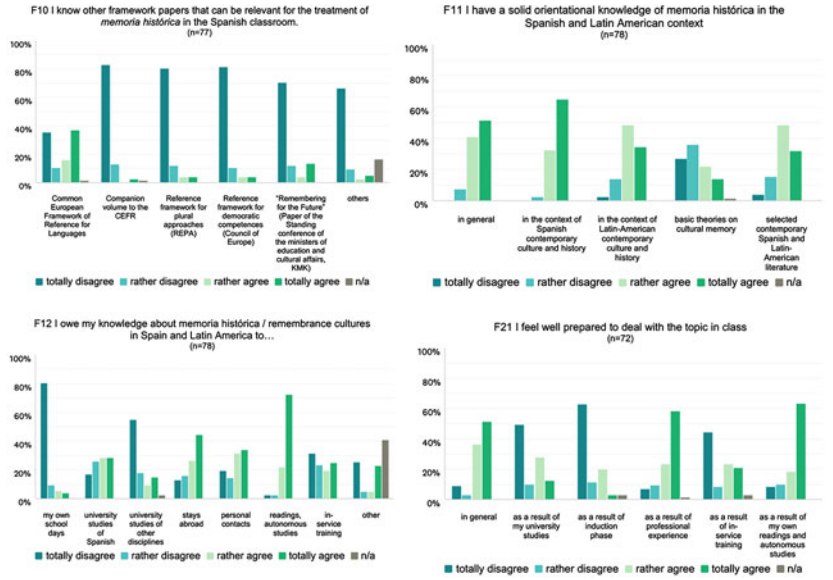


Fig. 9 Selected results from 2021 survey among in-service teachers of Spanish

without sacrificing the integrative perspective as well as the desired bidirectional theory–practice feedback.

13.5 Conclusion

Coherence and professional orientation are considered key aspects for successful teacher education and have been at the centre of the described curricular reform efforts in Freiburg. For the creation of coherence-oriented learning opportunities, it is important to take into account the complexity of the concept of coherence and the polyfactorial nature of learning: The IMS concept on memory cultures outlined here (which is based on an adapted and interdisciplinary implementation of the widely evaluated 4C/ID model, co-teaching, and core practices) can be regarded as the implementation of a coherent learning 'offer' (seen from the mentioned TE 'supply side')—its effectiveness, however, must also be 'measured' by its reception by students. Concerning the concept's impact on different levels on coherence construction and perception, evidence for an increased sense of coherence emerges (with individual differences) while the actual increase in competence through knowledge integration needs further investigation. Furthermore, the importance of a broader perspective which goes beyond the individual course and its interaction with the rest of the TE program (in the sense of vertical coherence, in particular) is also evident—both in the reactivation of course-content from previous courses and with regard to the relevance for future professional action in the school context. In this context, the exchange with in-service teachers—in different formats of communities of practice—shows that an interlocking of theory and practice requires dialectical processes that highlight new potentials for innovation, but also discrepancies between university teaching and school-based foreign language teaching. Accordingly, initial findings of the project have shown the high context-dependency of coherence-oriented teaching as well as the need for collaborative, coordinated and personalized approaches.

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Coherence – The What, the Why, and the How

14

Esther T. Canrinus

Abstract

In this chapter, what is understood as coherence and how this construct is conceptualized in this book is discussed. First, different facets of the disco ball called coherence are presented as well as supplemented with new ones. Next, a discussion is offered as to why attention is being paid to perceived coherence in teacher education research. Although many researchers have investigated student teachers' perceptions, this should not be seen as the final outcome. Investigating the implications of coherent programs is suggested as a further avenue to be pursued in research. Lastly, additional suggestions for future research into coherence in teacher education are presented before providing an overview of the insights gained from this book.

Keywords

Teacher education • Program coherence • Future research

14.1 Introduction

When I first began studying teacher education as a PhD student in 2006, I understood that it consisted of multiple sub-fields: the subject itself, subject didactics, pedagogy, and teaching practice. Each of these parts has its own traditions, demands, and ideas about what quality teacher education entails. At that time, studies describing teacher education programs were being published

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which showed how the various parts of teacher education were being combined and weighted differently across countries (e.g., Darling-Hammond & Lieberman, 2013; Maandag et al., 2007). These differences in teacher education programs are still present, as is made apparent by the description of the teacher education programs participating in the ConnEcTED project (Symeonidis et al., 2024, chapter 1).

A recurring issue in teacher education, according to researchers, has been the lack of connections between the various parts of teacher education programs (e.g., Anderson-Levitt et al., 2017; Bain & Moje, 2012). First, the focus was on the divide between theory and practice (e.g., Krumsvik & Smith, 2009; Miller, 1984), in particular the lack of practice in teacher education (e.g., Reid, 2011). This resulted in changes involving more practice, different forms of practice, and different or stronger collaborations between universities and practice schools. Professional development schools were started to bridge the gap between theory and practice. Indeed, a large-scale study in the Netherlands showed that student teachers educated through a professional development school experienced higher levels of efficacy and were evaluated more favourably on their teaching skills by their students and by experts (Helms-Lorenz et al., 2018). Subsequently, the focus shifted away from the connection between the university and school and towards the connections between courses at the university, such as subject didactics and educational sciences. The chapter by Doetjes and Hatlevik (2024, chapter 12) presents an example of work addressing this issue.

During my post-doctoral position at the University of Oslo, Norway, I was introduced to the concept of coherence through the CATE (coherence and assignments in teacher education) study. The study was a relatively large-scale investigation of coherence. It was one of the first to include student teachers' perceptions of coherence in their teacher education program through use of a structured survey (e.g., Canrinus et al., 2017, 2019; Hammerness et al., 2020). Since then, many more studies have included the students' perspectives, be it via surveys or through interviews (e.g., Domović et al., 2024, chapter 5; Mikkilä-Erdmann et al., 2024, chapter 4). In addition, the CATE study included data from teacher education programs in various countries (e.g., Chile, Finland, the U.S.) which made it possible to learn from similarities and differences across countries. Examples of such comparative perspectives can also be found in this book (see Symeonidis et al., 2024, chapter 2; Doetjes and Zaki, 2024, chapter 9). The whole ConnEcTED project has an international focus towards understanding coherence. Despite my post-doctoral position having ended after two years, the work on coherence in the teacher education program at the university of Oslo (e.g., Carrai and Hatlevik, 2024, chapter 8; Doetjes and Hatlevik, 2024, chapter 12) and in

other countries is still ongoing, as seen in the present volume. Coherence is not an end state, it is a process (Canrinus et al., 2017; Richmond et al., 2019) and as such, it is something which must remain in constant discussion. The chapters in this book provide multiple opportunities to discuss coherence in teacher education.

This final chapter of the book has been structured around the following three questions: what, why, and how? The questions and their answers are often closely interlinked. As such, overlap between them is to be expected. This chapter concludes by highlighting the insights gained from this book and its research.

14.2 What?

Throughout this book, coherence is conceptualized, studied, and referred to in numerous ways. Chapter 3 (Heikkilä and Hermansen, 2024) presents a short overview of several of the conceptualizations. The following is a list of conceptualizations as encountered in the chapters within this book and does not aim to be exhaustive. The chapter numbers in which the conceptualization was found are given in parentheses.

- Transnational (2)
- Horizontal (4 and 13)
- Vertical (4 and 13)
- Epistemic (3)
- Conceptual (3, 4, 5, 11 and 12)
- Structural (3, 4, 5 and 12)
- Perceived (4, 5, 9 and 12)
- Disciplinary (7)
- Content (5)
- Contextual (5)
- Program (3, 4, 5, 9, 11, 12, and 13)
- Biographical (3 and 9)
- Transitional (3)
- Institutional (3)
- Effective (13)
- Coherence as a process (5 and 7)
- Sense of coherence (8, 9 and 13)
- Intended, implemented, achieved (10 and 13)

The list above underlines the necessity of clarifying what is actually meant when referring to coherence, as we might be studying different things. Are we discussing the same thing when we address coherence across countries (Symeonidis et al., 2024, chapter 2; Doetjes and Zaki, 2024, chapter 9) and coherence across disciplines (Roiha and Heinonen, 2024, chapter 7)? Are we investigating the same construct when we study student teachers' perceptions (Mikkilä-Erdmann et al., 2024, chapter 4; De Smet and Schmider, 2024, chapter 6) and teacher educators' collaboration (Doetjes and Hatlevik, 2024, chapter 12)? Coherence is a multifaceted construct and like with a disco ball, light can be shed on different features of the same situation. Depending on which facet we want to zoom in on or what aspect we choose to focus on, different conceptualizations are of relevance. This book provides the reader with several pieces from the disco ball of coherence and has even added some additional facets with the introduction of transnational (Symeonidis et al., 2024, chapter 2), disciplinary (Roiha and Heinonen, 2024, chapter 7), and epistemic (Heikkilä and Hermansen, 2024, chapter 3) coherence.

When studying these various conceptualizations, we need to keep in mind that these are linked to different levels of teacher education (see Reiser and Zaki, 2024, chapter 13). This also has implications for which actors should be included in studies concerned with these facets of coherence. At the level of teaching student teachers, the coherence between lectures within and between courses is relevant and the teacher educators' and student teachers' perspectives are important sources of information (e.g., Doetjes and Hatlevik, 2024, chapter 12; Domović et al., 2024, chapter 5). At the program level, coherence between courses, including placement, and coherence across subjects is of focus. Here, teacher educators, student teachers, and program coordinators/program leadership are important sources of data (e.g., Hermansen, 2020). Coherence between programs and across countries requires similar participants in a study, but district and country policies must be included to be able to understand the contextual actors, influences, and guiding principles. Chapter 2 (Symeonidis et al., 2024) and chapter 11 (Metsäpelto et al., 2024) are examples of such studies.

Additionally, there is the facet of coherence from a longitudinal perspective, also known as vertical coherence. This includes coherence between semesters and between years within a teacher education program, as well as between teacher education, the induction phase, and teacher professional development. Different powers are at play when investigating coherence within a teacher education program vs coherence across arenas for teacher professional development after graduation. Establishing an agreed upon vision and integrating this throughout a teacher education program takes time and effort and is a continuous process (Floden et al., 2021; Hammerness, 2006). To establish this across contexts is an

even greater achievement and a very complex task. Practice schools and teacher education programs may have already achieved this as the schools are likely part of the teacher education program in one way or another (cf. professional development schools). Yet, as student teachers will be working in different schools in different locations after graduation and schools may hire new teachers with backgrounds from different programs, establishing a shared vision across contexts becomes more complex. Furthermore, as stated by Toom and Husu (2024) in chapter 10, it is not always clear cut what teacher education should focus on regarding teacher expertise and what the main focus for development during teacher professional development should be. The division of labor and expressed areas of focus might be agreed upon on paper, yet reality may reveal a different practice. Other actors might also come into play when talking about teacher professional development. Teacher education programs are not the only ones who offer courses, seminars, etc. Professional associations, private companies, and others may offer professional development courses or training for teachers. How can coherence be assured with so many stakeholders that may be unconnected to the teacher education program?

An understudied level in the vertical line of teacher education and teacher professional development relates to biographical coherence. Smeby and Heggen (2014) defined this coherence as: *the extent to which learning in professional education is promoted by pre-enrolment experience from higher education and work* (p.73). Teacher students do not enter teacher education as blank slates. Nor do teachers enter professional development as such. The personal narratives of learners are important in the learning process and, as Doetjes and Zaki (2024) state in their study in chapter 9, they influence perceptions of coherence. Even though Doetjes and Zaki have provided a first indication of the significance of such, we still know little about how previous experiences contribute to or hamper perceived coherence in teacher education.

14.3 Why?

Now that we have an idea of what is meant when we say that we are studying coherence, I will move on to the "why." Although many parents may find the question "Why?" to be exhausting and annoying, it lies at the heart of learning and understanding. Similarly, it lies at the heart of research. Questions arise when an apple falls from a tree, when some people, but not others, survive specific illnesses, when we see people behave in particular ways, etc. Why do these things

happen? Why do we do the things we do? Therefore, the question can be posed: Why study coherence in teacher education?

Researchers study coherence in order to understand coherence in teacher education, to understand how it is perceived, and to find out how it may be strengthened within and across programs. This is also what the chapters in this book attempt to achieve,but why do we want to understand and find out about these things? In their introductions, most of the chapters refer to problematic fragmentation in teacher education (Symeonidis et al., 2024, chapter 2; Metsäpelto et al., 2024, chapter 11; Doetjes and Zaki, 2024, chapter 9; Doetjes and Hatlevik, 2024, chapter 12) or similar terms such as dichotomies (Roiha and Heinonen, 2024, chapter 7) or independent domains (De Smet and Schmider, 2024, chapter 6). I'd like to point out that the authors refer to fragmentation as problematic because in the chapters, this fragmentation, or the dichotomies or domains are perceived as an unwanted situation, a problem that needs to be addressed. Heikkilä and Hermansen (2024, chapter 3) and Mikkilä-Erdmann and colleagues (2024, chapter 4) take a slightly different perspective. They acknowledge differences between the parts that compose a teacher education program and focus on how to help students bridge the differences (Mikkilä-Erdmann et al., 2024, chapter 4) and integrate it into a clear understanding (Heikkilä and Hermansen, 2024, chapter 3). One could argue that the authors of these chapters also consider the differences as problematic. Yet, there is a difference between viewing a problem as something that needs to be solved (the program is not coherent enough and should be made more coherent) and viewing something in its present state that exists and therefore needs to be understood (we need to help students make sense of the different parts and their potential connections).

Buchmann and Floden, in their article "Coherence, the rebel agent" (1992), make a distinction between coherence and consistency. "*While consistency implies logical relations and the absence of contradictions, coherence allows for many kinds of connectedness, encompassing logic but also associations of ideas and feelings, intimations of resemblance, conflicts, and tensions, previsagements and imaginative leaps.*" (p.4). More recently, and in line with this quote, Levine and colleagues (2023) also stressed the importance of ensuring that conflicts are addressed and that fragmentation is recognized in order to ensure flexibility when working on coherence in teacher education. Teacher education strives for coherence. This implies embracing contradictions and conflict, as well as keeping them on the agenda. In future research we must keep this understanding of coherence in mind. When, for example, interpreting survey data results on student teachers' perceptions of coherence, we need to ask ourselves how to interpret the observed data. How much inconsistency, how many contradictions, how much difference do we

allow before we refer to "problematic fragmentation" or state that a teacher education program is incoherent? Is there a limit at all? And if there is a limit, are there parts in the program where we allow larger differences to exist than in other parts?

There are no general, definitive answers to these questions. Based on the work done in a teacher education program, some may perceive a 3.0 on a five-point scale as improvement, whereas others may not. As an example, we can find different evaluations of similar numbers in this book (see Mikkilä-Erdman et al., 2024, chapter 4 and Domović et al., 2024, chapter 5). The answers to the questions above are context dependent and, as myself and others have previously stressed, coherence is a dynamic process (e.g., Bateman et al., 2008; Canrinus et al., 2017; Levine et al., 2023; Richmond et al., 2019). A coherent program is one that is constantly composed and (re)arranged based on a vision shared by the key actors within the program. Several authors have stressed the importance of a shared vision amongst teacher educators to ensure coherence in teacher education (e.g., Grossman et al., 2008; Hammerness, 2006; Tatto, 1996). Indeed, a shared goal, an agreed upon focus, a goal to strive for by all will most likely point the various components of the teacher education program into the same direction. An underlying shared vision is believed to contribute to students making sense of their program (Grossman et al., 2008). Yet, a shared vision is not sufficient. As exemplified in Chapter 12 (Doetjes and Hatlevik, 2024), in addition to a shared vision, there should be an understanding of how partners and colleagues in the teacher education program perform their tasks (Hermansen, 2020). Moreover, there should be room for differences (e.g., Levine et al., 2023; Richmond et al., 2019; Tatto, 1996) to be able to refer to coherence instead of consistency.

Returning to the question of "why?". Why again are we investigating coherence in teacher education? Most of the chapters in this book investigate the extent to which student teachers perceive their program to be coherent. Chapter 4 (Mikkilä-Erdman et al., 2024) includes, additionally, student teachers' perceived self-efficacy. The importance of including students' perspective is underlined in chapter 7 (De Smet and Schmider, 2024) where the authors conclude their results with a clear statement: "*The most well-designed educational training program is futile if students fail to recognize its value and purpose*" (p. XX). Although I applaud the inclusion of the students' perspective, this should not be the final outcome. Students may perceive little or much coherence in their teacher education program, but what implications does this have? Why do we aim for high levels of coherence (sidestepping the discussion above on what degree of coherence we should be aiming for)? Why do we measure student teachers' perception of coherence?

Studies outside teacher education have shown that coherent education programs contribute to higher levels of student outcomes (e.g., Bateman et al., 2008; Fortus & Krajcik, 2012; McQuillan et al., 2012; Newmann et al., 2001; Schmidt et al., 2005; Snipes et al., 2002; Timperley, 2005), to the learner's ability to transfer the learned content to different contexts (Geraedts et al., 2006), and to the learner's motivation (Newmann et al., 2001). The latter outcome has also been observed in teacher education programs, (Oettle et al., 2019). Yet, there are very few studies that have investigated the outcomes of student teachers' perceptions of coherence and those that have are based on cross-sectional studies. Smeby and Heggen (2014) observed that coherence in the teaching practicum and coherence at university significantly explained student teachers' self-reported theoretical and practical knowledge. In our 2019 study, Goh and I found a positive relation between perceived coherence and student teachers' self-efficacy beliefs (Goh & Canrinus, 2019). Furthermore, using structural equation modeling, Oliveira Leite and colleagues (2022) showed that perceived coherence contributes to student teachers' professional agency, although to a limited extent and in different ways depending on which year of study the students attended.

It is intuitively logical that a coherent program contributes to better understanding, but does this also imply the statement that a coherent program results in graduates who are more competent teachers? At the end of their program, do student teachers match the shared vision of the faculty, both in vision (as in the study by Tatto [1996]) and behaviour? Will perceiving your teacher education program as coherent contribute to your intent to stay in your profession? Will it make you a happier student or a happier teacher? To what extent do pupils of teachers who perceived their program as coherent perform different from pupils of teachers who perceived their program as incoherent? Do the pupils perceive differences between these teachers? To what extent do colleagues and school leaders or administrators perceive differences between these teachers? Do they perceive any difference at all? What other concepts should we include as a potential result of perceived program coherence? This is still an open field.

If we perceive fragmentation to be problematic and want to fully understand the implications of fragmentation, we need to investigate the actual implications of this fragmentation. Or, looking at the situation through a more optimistic lense, we should investigate the implications of perceived coherence, keeping in mind that coherence includes differences and conflicts. How much difference and conflict we allow for in teacher education programs is still up for debate.

14.4 How?

Including outcome measures is one way to further investigate coherence in teacher education. However, other possible research designs should be considered as well. Several chapters in this book included data from multiple timepoints or from participants in various stages of being or becoming a teacher (e.g., Doetjes and Zaki, 2024, chapter 9; De Smet and Schmider, 2024, chapter 6; Reiser and Zaki, 2024, chapter 13). Including various perspectives of a teacher education program, such as student teachers' as well as newly graduated teachers' perceptions, will contribute to understanding what the strengths and opportunities of a program are. It also provides some clues as to how coherence changes over time. Still, the data remain cross-sectional and retrospective. The question that continues to be unanswered is how coherence is perceived over time by the same participants and what this means for potential outcomes. Particularly if we aim to understand vertical coherence, answering these questions is key.

This call for longitudinal studies is not new. It actually is a repetition of a call for such studies made by Schwichow and colleagues in 2019. Although there are many threats to internal validity when performing longitudinal research, it is necessary to attempt such a task if we want to understand how perceived coherence reveals itself and possibly changes over time. Understanding coherence over time is also important in relation to transnational coherence. If students can continue their teacher education in different programs in different countries, we need to know how coherence is construed. Students in their first year may require different kinds of help in creating coherence compared to students in their fourth year. Moreover, we need quantitative studies with a longitudinal design if we want to understand the durability of program changes aiming for more coherence and how these changes impact and possibly continue to impact (student) teachers. In such a longitudinal design, researchers might consider including (student) teachers who retrospectively answer questions about their perception of program coherence (like Carrai and Hatlevik, 2024, chapter 8 and Domović et al., 2024, chapter 5). There are, however, also possibilities to investigate how perceived coherence in year 1 influences coherence in year 2 or how perceived coherence during teacher education may impact other variables after graduation. What is vital for such designs is following the same participants and ensuring that their data can be linked. Questions along the line of "How does perceived coherence measured during teacher education (timepoint 1) influence professional commitment to the teaching profession when teaching (timepoint 2)?" may then be posed.

Longitudinal studies using qualitative methods would also be a valuable contribution to the field. To fully understand the process of sense-making and creating

coherence in teacher education an ethnographic case study of one or several student teachers in their attempt to understand their teacher education program could be conducted. In addition to gaining insights into the process of creating coherence, this would provide an opportunity to learn more about vertical coherence. Questions that could be raised may address students' recourses when making sense of the conflicts and differences in their program inherent to coherence, or how students cope with inconsistencies and whether this should be perceived as a "productive struggle", a worrisome confusion, or something else entirely. In these cases, students might turn to each other for help. Through social network analysis, students' collaborative construing of a coherent view of their teacher education program might be studied. In addition to formal teaching situations, learning takes place in informal situations as well (e.g., Hermansen, 2016; Kvam, 2021). Understanding how students are connected is essential in understanding to what extent and how students reach out to each other in creating a coherent perception of their studies. As mentioned in chapter 9 (Doetjes and Zaki, 2024), the personal positions of the students may influence their perception of coherence. Using social network analysis may, furthermore, provide information on whether, and if so how, teacher educators should and could facilitate or strengthen student networks to enhance students' perception of coherence.

14.5 Take Away – Lessons Learned

In general, this book has provided an insight into different projects investigating various manifestations of coherence in teacher education. When viewed together, the chapters serve as the mirrored pieces of a disco ball, each of which contributing to the whole, shining light on the concept of coherence in teacher education. New facets have been added through terms as transnational (Symeonidis et al., 2024, chapter 2), epistemic (Heikkilä and Hermansen, 2024, chapter 3) and disciplinary coherence (Roiha and Heinonen, 2024, chapter 7). Moreover, the importance of coherent research-based teacher education programs has been underlined (Toom and Husu, 2024, chapter 10). Based on empirical data, the chapters in this book have shown that student teachers in programs with (Mikkilä-Erdman et al., 2024, chapter 4; Domović et al., 2024, chapter 5; De Smet and Schmider, 2024, chapter 6) and without (Doetjes and Hatlevik, 2024, chapter 12) program reform, or in programs having implemented a specific way of teaching emphasizing coherence (Reiser and Zaki, 2024, chapter 13), perceive coherence within their teacher education program. In-service teachers also reported positive perceptions of the coherence between what they learned during teacher education

and their current practice (Carrai and Hatlevik, 2024, chapter 8). As such, the continuous referencing of teacher education as "fragmented" and the perception of such as being problematic might be in need of nuancing. The problematic fragmentation may still exist in some programs, but we need an additional or different argument for continuing our work on coherence in teacher education. Moving the focus to transnational coherence (Symeonides et al., 2024, chapter 2), as done in the ConnEcTED project, or studying the impact of perceived coherence, as argued for above, are some potential ways forward, particularly as both are understudied.

Additionally, as teacher educators and researchers, we need to discuss how much inconsistency and conflict we believe to be manageable within teacher education programs. Coherence inherently includes inconsistencies and conflict (Buchman and Floden 1992; Levine et al., 2023). In the discussion on what to accept, we need to keep including the voices of the student teachers (Canrinus et al., 2017; De Smet and Schmider, 2024, chapter 6; Floden et al., 2021), which includes both the present students as well as the past students. In this way we can learn from their experiences and let them provide us with feedback on any implemented changes. The studies in this book have shown that these students provide valuable information about the teacher education program, pointing us in directions where there are opportunities for improvement.

The chapters in this book reveal, furthermore, how, across countries, teacher educators and researchers continue to work on establishing coherent teacher education programs. Obtaining an agreed upon or shared vision is possible, both within a program (Doetjes and Hatlevik, 2024, chapter 12) and across programs (Metsäpelto et al., 2024, chapter 11). Nevertheless, it requires deliberate work with relevant actors closely collaborating and putting in the time and effort to understand each other's position, tasks, and work. The ConnEcTED project, and this book, are first steps towards discussing a shared vision across countries.

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