From Didaktik to learning (sciences)

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Learning: a new core narrative for teacher education?

Until recently, Didaktik was the major narrative in and for the curricula of teacher education in Scandinavia. This was the narrative that shaped the curricular content of the subject *Pedagogikk* or pedagogy in teacher education programmes (Kansanen, 1995; Westbury, 2000). As a knowledge domain,¹ the Didaktik narrative highlighted the central pillars of teacher education curricula in Scandinavia (Skagen, 2006; Werler et al., 2009; Werler, 2014). Didaktik was considered to be the language of *Pedagogikk*, a linkage that links teaching with learning (Werler and Sæverot, 2017). According to this narrative, knowledge of Didaktik enables teachers to act in a way that creates meaningful pedagogic situations for their pupils. The argument went further and held that narratives of Didaktik “restrain teachers”, in Hopmann’s phrase, towards the idea of Bildung (Hopmann, 2007). The assumption was that as student teachers acquire knowledge of Didaktik, this will support and guide their decision-making processes towards pupils’ meaning-making in schools.

One of the consequences of the strong focus of Didaktik on teacher autonomy has been that teacher education programmes following this narrative across Scandinavia are based largely on principle, rather than pragmatism as is the case in the curriculum tradition (Reid, 1997). It has been critically pointed out that Didaktik’s traditionally philosophical rather than empirical focus (Künzli, 2000) has contributed to the distancing of teaching practices from the school curriculum. Questions have been raised about the persistence of this concept, whether it should survive as the core of central (and northern) European teacher education (Pantić and Wubbels, 2012). The study on which this chapter is based shows, among other things, that a shift has taken place in Scandinavian teacher education towards the curriculum tradition. It is not to be expected, however, that change in these core narratives will be rapid and comprehensive. Examples from eastern Europe show that new narratives may have some features in common with old ones (Anchan, Fullan and Polyzoi, 2003). Furthermore, it is not unlikely that the fuzzier and more blurred a new narrative is, the more long-lasting the old narrative may be.

The subject of this chapter is the changes and subsequent modifications made to the reformed Norwegian curriculum for primary and secondary teacher education since 2010. Its particular interest is the new subject Pedagogy and Pupil Knowledge (PPK) and the changes to teacher education represented by its core narrative. The chapter provides insights into the framework of so-called learning experiences, the framework that forms the basis *Pedagogikk og elevkunnskap* (pedagogical studies), the only non-school subject taken by current student teachers. The chapter therefore examines the hypothesis that the traditional core narrative of Didaktik in Norwegian teaching education has been replaced by a narrative of ‘learning sciences’. The main aim of the chapter is to examine the advocacy of the Organisation for Economic Co-operation and Development (OECD), a powerful stakeholder, for the implementation of learning-science content in teacher education. The research behind this chapter is thus a contribution to curriculum research in teacher education, contributing in particular to the opening of the black box of the teacher education curriculum. In particular, the chapter considers the differences between the historical and the desired core narratives of teacher education. Such a procedure identifies consensual and/or competing forces in the process of education reform (Fullan, 1993).

The chapter consists of four sections. Section one investigates the relationship between Didaktik and teacher education; section two discusses epistemological aspects of ‘learning sciences’; section three asks whether learning is the answer in teacher education; and section four examines the consequences of enactment of the reform for teachers’ professionalism.

Section one: the Scandinavian way of teacher education – Norway as a case

This chapter takes Norway as an example of the Scandinavian tradition of Didaktik-driven teacher education. Norway provides a paradigm case of the substantial and conceptual development of teacher education across all Scandinavian countries. Key to this type of Didaktik-driven teacher education is that it derives its inspiration not from academic disciplines close to the natural sciences, such as psychology, sociology, biology, or economics, but from people’s lived lives and what it means to develop as a human being. Such a pedagogy, based on what it is to be human, is linked to the arts and humanities as well as to philosophy.

Scandinavian teacher education programmes have in common that they are rooted in the seminar tradition, applying Herbart’s consideration of the paradox of schooling and the pupil’s subjectivity (von Oettingen, 2016). Generally, these curricula have in common that they aim to promote the freedom of the individual. The pupil is given the opportunity to free him or herself from his or her roots in society through teaching. Hence, teacher training aims to qualify the individual for a universally free and responsible life. Student

teachers should therefore learn to teach what cannot be learned in any other place in society.

Because of their shared basis, Scandinavian teacher education programmes share a similar value structure: one that is *Bildung* led, teacher oriented, and content focused. This conceptual triad is intended to safeguard the autonomy and responsibility of professional teachers. Today, by contrast, Scandinavian teacher education is primarily characterised by integration of school-subject knowledge with the teaching perspective. This means that the emphasis is on the curriculum of the school and on instruction in school subjects rather than academic knowledge. But key to these same programmes is enabling future teachers to make autonomously meaningful decisions in insecure and ill-defined situations – decisions that are intended to create just and fair educational situations for all pupils.

These shared general principles underlie the centrality of Didaktik in Scandinavian teacher education. The central aim is that teachers should contribute to social equality. As part of this, teachers must be put in a position to practise *interaction* between teachers and pupils. For this reason, Scandinavian teacher education is conspicuous in being based on teaching from first to fourth grade, and from fifth to tenth (or ninth) grade, rather than on school subjects as such. It is therefore characteristic of the Scandinavian teacher education tradition that teachers are generalists.

Although it has been argued that teacher education varies structurally between the Scandinavian countries (Werler et al., 2009), this may be an insider's view. Seen from outside, the core structure consists of studies in the school subjects, pedagogical studies, and school practice. Pedagogical studies comprise 60 *European Credit Transfer System* and last between four (in Denmark) and five years (in Sweden and Norway), thus making up the largest share of the curriculum. Further, the Scandinavian countries also have in common that teacher education is centrally governed by framework curricula.

Another indicator of a shared core of teacher education in the region is the recent reform policy. Standardisation, modularisation, demands for stronger specialisation, and an increased focus on ready-to-teach competence characterise all the national Scandinavian policy responses (Elstad, 2020; Trippstad, Swennen and Werler, 2017a).

Having discussed the common and central characteristic of Scandinavian teacher education programmes, the following section presents challenges linked to recent teacher education reform movements, as well as discussing the research problem and illustrating the research approach taken.

Reforms in Scandinavian teacher education

Curriculum reforms are the rule rather than the exception in Scandinavian teacher education (see Table 2.1). Such reforms reflect the shifting tides of stakeholder expectations for the functionality and modes of operation of teacher

Table 2.1 Reform phases and reform objectives of teacher education in Scandinavia

Reform wave	1	2		3		
	I	II	III	IV	V	VI
Denmark	1966	1991	1997	2001	2006	2012
Norway	1973	1994	1999	2003	2010	2017
Sweden	1965	1978	1988	2001	2011	
Reform objective	Stabilising teacher education structure	Pedagogy and Didaktik as core of the programmes		Structural modification and adoption according to the Bologna Process		Learning (sciences)

education. The current wave of teacher education reform (Trippestad, Swennen and Werler, 2017b) in Scandinavia has however been driven by the critique that the teaching force is inadequately trained and prepared. The perceived proof was disappointing national PISA (*Programme for International Student Assessment*) results. The inference, as presented by government policymakers, was that these measurement results were due to the poor professional qualification of teachers and institutional underperformance by national teacher education programmes.

This rhetorical construct resulted in several national programmes to evaluate teacher education, which documented severe shortcomings (in Denmark, in 2003 (EVA, 2003); in Sweden, in 2004 (HSV, 2005); and in Norway, in 2005/06 (NOKUT, 2006a, b)). In summary, the reports argued that candidates lacked a clear knowledge base. Furthermore, they did not have pedagogical competencies capable of satisfying the needs of schools. It was also demonstrated that teacher education programmes lack coherence, apply inadequate concepts of knowledge, and are not anchored in current research. The rhetoric of political reform used in these documents stressed, across all three countries, that all efforts to improve student performance will fail unless the quality of the future teaching force is improved. Here the reports took up ideas on the correlation (note, not causation!) between teacher quality and student performance (Darling-Hammond and Youngs, 2002).

The evaluation projects had been preceded by the OECD study, *Teachers Matter: Attracting, Developing and Retaining Effective Teachers* (2002–04; OECD, 2005) on the effectiveness of teacher education. Scandinavian country reports had been published as early as 2003 (in Denmark, Jacobsen and Thorslund (2003); in Norway, the Work Research Institute (AFI, 2003); and in Sweden, the National Advisory Committee (2003)). A common feature of the studies was that they all reported concerns about qualitative shortfalls. Teachers were described as not having the ‘right’ knowledge to meet schools’ needs.

A follow-up OECD recommendation report (OECD, 2005) suggested that the quality of teacher education in terms of pedagogic as well as professional

knowledge must be improved. In order to improve pedagogical knowledge, it was pointed out that evidence-based knowledge should be applied.

The teacher education reforms came in waves. The first two waves of reform were on the national level and were concerned with creating teacher professionalism. The first of these responded to the need for mass education related to the reproduction of the nation state; internal coherence and effectiveness were then the major target areas for the second wave. Then, in a third wave of reform, against the background of the PISA policy discourse and the evaluation results just mentioned, the governments of Norway, Sweden, and Denmark initiated substantial measures to change both the structure and the curricular content of teacher education programmes. This third wave was completed in two steps (see Table 2.1). As a first step, teacher education structure was adapted to international trends. Several key elements – including admission requirements, the structure of training, the length and level of education, and quality standards – were modified in all the Scandinavian countries. Structurally, the reforms pushed teacher education from the seminar tradition towards “universitification” (Werler, 2014, p. 116). They also forced through the commodification of teacher education (Werler, 2016) and of a curriculum based on taxonomic learning-outcome descriptions (Werler, 2017b). The new teacher education structure presents teacher education as something technical, accountable, and measurable.

In the second step (VI) of this third wave, the reform focus moved on to curriculum aspects. The central concern of these reforms was to replace identity patterns that were now regarded as obsolete with new patterns of action through gradual universitification and scientification. Two reforms were implemented to bring the curriculum closer to the ideal of scientific research and training. A primary take was the implementation of various research-based teacher education approaches (Munthe and Rogne, 2015; Werler et al., 2012; Alvunger and Wahlström, 2018; Werler et al., 2009). With reference to the importance of teachers’ knowledge about upbringing and about teaching and learning, the core domain of teacher education – *Pedagogikk* (educational/pedagogical studies, pedagogy) – was now transformed in a government white paper into something new: *Pedagogikk og elevkunnskap* (Pedagogy and Pupil Knowledge) (Ministry of Education, 2009, p. 20).

The research problem: a new core narrative for teacher education?

In order to achieve the scientification and modification of education studies, the OECD established the narrative that the “pre-scientific discipline” of pedagogy (OECD, 2002, p. 10) should be removed from teacher education. It was suggested that such knowledge and practice should be replaced by curricular content from the so-called learning sciences (pp. 22, 26, 88, 90). The OECD pronounced that it values the learning sciences as a powerful tool “to shed new

light on questions about human learning” (p. 27). It argued that “brain science” (p. 25) suggests ways in which “the practice of teaching can better help young and adult learners” (p. 27). Further, the learning sciences are judged to be necessary requirements for “effective learning” (p. 27). A recent study (Trippestad, Swennen and Werler, 2017b) has documented the strong influence of the OECD on recent teacher education reform efforts. Until recently, the “pre-scientific discipline” of Didaktik had formed the backbone of teacher education programmes.

Against this background, this chapter explores the current space and place of Didaktik compared to ‘learning sciences’ in Norwegian teacher education. Although the study is limited to teacher education for primary and lower secondary school, it also investigates changes in the professional knowledge domain of teachers in order to understand how teachers might be enabled to develop “public good professionalism” (Walker and McLean, 2013).

After narrowing its research focus down to the narratives on which education programmes are based, the chapter operationalises this focus through three research questions:

- 1 In order to develop an understanding on the basis of which to conduct a comparison between narratives, it is essential to outline the Didaktik narrative of the first two phases of teacher education. The first research question – What characterises the Didaktik narrative and what was its purpose in earlier teacher education programmes? – can therefore be answered by a brief narrative analysis of Didaktik related to teacher education. This answer is provided in section two.
- 2 The second research question is: How does the OECD (2002/07) explain and frame its conceptualisation of the learning sciences? This part of the research investigates the OECD’s conceptualisation of the ‘learning sciences’. Once again, narrative analysis will help to reveal this. In order to gauge how far the OECD concept may deviate from the scientific discourse on the issue at hand, international handbooks on the learning sciences (Sawyer, 2006; Fischer et al., 2018) are consulted. Readers will find the answer in section three.
- 3 A comparison of the distilled narratives of Didaktik and ‘learning science’ with the core narrative of the current teacher education curriculum will answer the third research question: What narrative elements of the OECD approach can be found in the third wave of teacher education curriculums in Norway? Answering this question will help to explain how far the OECD conceptualisation of the learning sciences has actually impacted on the current curriculum for teacher education. A response to this question is provided in section four.

The research questions are addressed by the application of curriculum analysis, a method not yet widely used in teacher education research. To answer

the research questions, the concept of a narrative curriculum analysis is developed, based on considerations of commonplaces as common denominators of practice (Schwab, 1977; Werler, 2006). Here the central idea is to follow the development of one of the commonplaces of teacher education: the subject matter as text (Schwab, 1977). The corresponding approach is outlined in the following section.

Narratives and the teacher education curriculum

In his book *After Virtue*, MacIntyre (2007) argues that human beings are essentially storytelling animals. Humankind is *homo narrans* (Fischer, 1984). Narrating or telling stories helps humans to organise themselves. If these arguments are taken seriously, it means that stories – narratives – organise people's knowledge and memory. But it goes further than this: applying narratives helps people to understand the actions of others (MacIntyre, 2007, p. 212). Since human life – and thus by definition teacher education – builds upon narration as a communication paradigm, research has to answer the prior question: of what narratives are teacher education a part? This ontological reflection on the human being constitutes the starting point for the approach I have chosen for the investigation.

Because it refers to *past* curriculum making, the research behind this chapter is informed by a narrative historiographic approach (White, 1980; Bruner, 1991). Following Hayden White (1980), reporting on the very nature of reality is narrative, because of the nature of culture – and so education is narrative. Any narrative translates human beings' knowing into telling (Bruner, 1986): this is how information is transmitted between persons (Bruner, 1991).

A text narrative is a hermeneutic compositum in which the text may mean different things to different persons. Hence, there is no definite measure to extract its truth (White, 1980), so there is no empirical method for extracting reality or truth (Bruner, 1991). While narratives are generic and normative (Bruner, 1991), they organise a person's experiences and represent the memory of human actions. That means that narratives are human constructs, mixing facts and human interest (Shiller, 2017). In other words, narratives provide models of identity and agency to their members (Bruner, 1986). Shiller (2017) reports on controlled experiments documenting people's strong and positive response to narratives. The approach used here, however, works without any reference to narrators (White, 1980, p. 7). Thus, the research is dealing with the qualities of a text rather than its agents. In proceeding this way, the narrative account helps to reveal the political and social order of curriculum making (Hegel, 1986).

A teacher education curriculum is a core narrative offering society a legitimate plan for the preparation, training, and knowledge domains (to be learned) of student teachers. Such a plan is a logical and coherent system of interrelated and sequential arguments that build upon a core of knowledge domains accepted by stakeholders as powerful or important. Such knowledge is characterised by

those stakeholders as justified true belief. That does not mean, however, that that core of knowledge is true: rather, that it is accepted as true and potent.

Such curriculum narratives are indeed potent, because it is through them that teacher-educators interpret their surrounding world. By creating and organising these stories, teacher-educators go on to build a sense of coherence among student teachers and establish trajectories for future action that will allow them to aspire to become capable of teaching other people's children (MacIntyre, 2007). As argued by Fisher (1984), a narrative in the teacher education curriculum offers symbolic actions (words) that create a certain sequence and meaning for teacher-educators. Taking a narrative perspective in research is therefore linked to decisions already taken regarding the content of teacher education curricula. The importance of studying curriculum narratives lies in the fact that their practical implementation determines the professional development of future teachers against the background of local curriculum development activities (Conle, 2000).

In identifying the core of the 'knowledge' narrative, we learn what stakeholders define as the major task of teacher education. The analysis of narratives reveals the focus of teacher education stakeholders on social problems and how they are to be addressed and solved, as well as the knowledge they regard as important for solving the problems linked to teaching other people's children. The elaboration of narratives is enormously meaningful because they are such important social and political forces, capable of changing reality.

The empirical material consists of classic texts as outlined in the *Didaktik* and/or curriculum dialogue, the curriculum guidelines for teacher education in Norway (KUD, 2009), the OECD documents on the use of learning sciences, and the handbooks on learning sciences.

As Saarinen (2008) has pointed out, it cannot be taken as given that the policy documents analysed (the teacher education curricula) describe something that really exists in teacher education practice. But these documents are not mere rhetoric, detached from real-life activities in teacher education.

The following section explores the *Didaktik* narrative and its purpose in previous teacher education programmes.

Section two: *Didaktik* and teacher education

Against the background of these arguments, the chapter reads *Didaktik* as a narrative. The Germanic term '*Didaktik*' is derived from the Greek verb *didaskein*, meaning to teach and by extension to learn (Heursen, 1997; Knecht-von Martial, 1985). In general, the term was first used in the *Didascalía* treatise, the first Church Order and a rhetorically composed didactic poem presenting the teaching of the 12 apostles (Lagarde, 1854/1967; Blankertz, 1975, p. 14). In education, the most suitable interpretation of the meaning of this word is the art of teaching. The educational history of *Didaktik* stresses that it is related to philosophical thinking, theorising, and the construction of theoretical models

for education. In all these cases, Didaktik theorising is used to answer the question of how to think, in such a way as to create both content and teaching activities that will form the educated personality. Thus, Didaktik is a normative statement system of how to construe teaching/learning processes according to various world views, concepts of humanity, or other guiding principles.

Based on Herbart's teaching work, *General Methods of Instruction Derived from the purpose of Education* (Herbart, 1806), the Didaktik narrative was developed primarily as the core discipline of teacher education (Seel, 1999). In this context, numerous theories and methods about ways of teaching and learning were developed. As instruments of teacher education, Didaktik narratives were conceptualised as concepts of *Bildung*. Hopmann illustrates this point and argues that "Bildung cannot be achieved by Didaktik. The only thing Didaktik can do is restrain teaching in a way opening up for individual growth of the student" (Hopmann, 2007, p. 115). In short, *Bildung* will be the outcome of the pupil's teacher-led confrontation, treatment, and transformation of the difference between subject matter (*Inhalt*) and the pupil's experience of its individual meaning (*Gehalt*).

Typical Didaktik narratives address the context of at least three subject areas of teacher education. At the content level, they make statements about what culturally and socially important content should be taught by teacher-educators and learned by student teachers. Further to this, they come up with statements about what pedagogic methods should be used in classroom teaching. This applies both to teachers as they unfold the content and to the pupils' ways of learning. Unlike theories that are justified by the argument of 'effectiveness', narratives of Didaktik demonstrate a normative and ethical reflection on reasoning. Such models are visualised in the well-known 'didactical triangle' model (Paschen, 1979; Prange, 1983), which links the subject to be taught and learned, the learner, and the teachers.

Place and space of Didaktik narratives

For the last 180 years, teacher education – both in institutions and in programmes – has served as the place and space of autonomous Didaktik development. The advancement of Didaktik narratives was concentrated in central and northern Europe (Seel, 1999; Gundem and Hopmann, 1998). However, teacher education also served as a teaching and learning arena for Didaktik theories. This outcome was achieved on the one hand through teacher education curricula, on the other through textbooks.

Several major narratives framed that development throughout the formation and development of the nation and welfare state. In telling the 'story of great men' such as Montaigne, Comenius, Fénelon, Rousseau, Pestalozzi, Fröbel, Dewey, or Makarenko – to mention only a few – early teacher education intended to support the transformative identity work of future teachers. A proper preparation for teaching was seen as dependent on the future teacher's

introduction to the heritage of the past in order to form their mindset and educational perspective. After the Second World War, the teaching of critical pedagogical approaches was intended to strengthen the future teacher's professional autonomy. Towards the end of the twentieth century, subject-matter didactics became the backbone of those programmes through their provision of narratives of Didaktik.

It can be argued that such stories about Didaktik (or about the 'great men' of Didaktik) were in fact the semantic content of teacher education; as such, Didaktik becomes the *subject matter* of teacher education. However, it is not the 'great men' stories that matter. What matters is the presentation of the 'great men's' educational philosophy in its context in such a way as to help future teachers understand the traditions they should become part of. The teacher's Didaktik thinking should be formed by the student teacher's encounter with subject matters such as general pedagogy, educational philosophy, and ethics. Further, learning about Didaktik in teacher education was regarded as having the potential to help future teachers to cope with uncertainty. Having the opportunity to learn about pedagogic knowledge in teacher education was thought to enable student teachers to make responsible and smart decisions in a situation that is often unforeseeable and characterised by dilemmas (Englund, 2000; Werler, 2017b).

The Didaktik narrative in teacher education

The fundamental aspiration of Didaktik narrative is to transform the ill-defined problem of the relationship between teaching and learning into better-defined models capable of describing how teaching can generate learning of defined subject matter or skills. The narrative offers a specific language for education, one that does not originate in other academic disciplines such as sociology or psychology (Werler and Sæverot, 2017). Such Didaktik narratives establish ideas about how and why the teaching of collective cultural content (matter) should be connected with the creation of individual significance (meaning) (Hopmann, 2007). It is crucial for the experience of individual significance that the learner experiences some of this content as existential (Sæverot, 2013). In other words, the narrative supplies future teachers with a well-founded meta-plan that answers the question as to how to impart a society's culture to learners. Such plans bring together fundamental ideas about cultural knowledge and about the teaching and learning of that knowledge. In short, Didaktik narratives are characterised by their aspiration to reduce both cultural and social complexity and contingency. However, even the most advanced narratives of Didaktik are not capable of developing teaching technology that guarantees learners will learn something specific, such as particular knowledge or a skill (Werler, 2015, 2017a). In contrast to evidence-based teaching methods, the use of Didaktik narratives generates flexible and viable thought patterns for the construction of teaching.

In teacher education, Didaktik emerges as narrative when it is demonstrated in the prescribed course reading that teachers are capable of reflecting on what should happen in the classroom (planning and organisation), what is happening in the classroom (leadership, discipline, enabling a learning environment, relationships), and what has happened in class (assessment, evaluation, analysis). In the context of teacher education, Didaktik narratives in teacher education address teaching and learning at a general level, taking into account participants, conditions, processes, and effects. In the given context, Didaktik is described as an encounter between the pupil, the teacher, and the teaching material (KUD, 2009, p. 16).

In the Norwegian case, examples of these narratives can be found in the three modules of Pedagogy and Pupil Knowledge (PPK). These are available as a 'learning outcome' description, and they address important aspects of Didaktik such as the representation of the subject matter and the interplay between all actors and the pupils' learning experiences (Künzli, 2000). Because no one can learn in chaos and randomness, teachers must create a pedagogical order and structure in the classroom. Such a disciplinary structure concerns both the choice of material and the discipline of the pupils. Therefore, the PPK description includes the requirement that teachers must know about "classroom management" and about "leadership of learning, development of a good learning environment and an inclusive learning culture" (KUD, 2009, p. 17). To be able to offer teaching as an opportunity for learning, teachers must know about "leadership of teaching work" and be able to "plan, lead, vary and evaluate their work" (p. 18). Further, the curriculum also addresses issues related to teaching and learning methods in which pupils are the hub of all actions. Student teachers are expected to be able to create "mutual pupil relationships, pupil cooperation" and to use "various teaching aids" (p. 18).

In particular, Didaktik narratives in teacher education address the overarching goals of schooling as well as the complexity of good teaching. With this in mind, one may characterise various Didaktik narratives as the professional language of teachers. Those narratives set out general frameworks for teachers' development of lessons; they provide knowledge about teachers' work in social and political contexts; and they offer knowledge about teaching, assessment, and judgement. Through constructive and prescriptive capacity (that is, through model generating), the teaching of Didaktik narratives is understood to contribute to student teachers' development into autonomous, self-developing, and professional actors.

It must be stressed in concluding this section that Didaktik is not congruent or identical on both epistemological and ontological levels with the narrative of general pedagogic knowledge (GPK) developed by Shulman (1987). Such a category error was indeed prominently asserted in the TEDS-M model (Blömeke and Delaney, 2014) and replicated in several other contexts (Voss, Kunter and Baumert, 2011). However, Didaktik narratives can best be seen as

bodies of reflective knowledge, which means that they are therefore beyond empirical testing of knowledge by means of psychometrics.

Section three: the learning sciences: a well-defined narrative?

The groundbreaking work done in the late twentieth century in teacher education on Didaktik was based on an epistemology that named the philosophical foundations of education – educational psychology, school theory, general didactics, and curriculum theory – as the basis for the profession. More specifically, it became a requirement for teacher education to be set within a “pedagogical framework” (NOU, 1988, p. 42). Didaktik in teacher education was thus recognised as the leading framework of teacher education, binding the entire programme together. A decade later, the Norwegian parliament demanded the strengthening of educational foundational thinking as well as the philosophy of education (NOU, 1996, p. 144). Corresponding implementation work was guided by the teacher education curriculum of 1999 (KUD, 1999).

However, the trigger for the third wave of reform was the narrative that teachers are inadequately qualified (NOKUT, 2006a, 2006b). The initiatives behind the 2009 white paper were motivated by the argument advanced in 2002 in the OECD’s *Understanding the Brain: Toward a New Learning Science* “that pedagogy should be replaced by neuroscience or learning science since these were perceived to be more effective for teachers’ work” (Summak, Summak and Summak, 2010; Hardiman et al., 2012; Tokuhama-Espinosa, 2008) – although there is no evidence for that claim (Werler, 2017b).

In order to contextualise the outlined epistemological change in the curriculum, the chapter now continues with a review of contemporary understandings of ‘learning science’, based on Sawyer (2006, online-update 2012) and Fischer et al. (2018). These two handbooks represent a contemporary repository of state-of-the-art knowledge about the learning sciences.

A content comparison between the two volumes makes it clear that there is no agreement at all on the contents, theories, or methods of the learning sciences. The synopsis of the contents of the two volumes (Table 2.2) shows that the authors essentially do not deviate from established ideas on learning; on the contrary, these are presented in a classical way, albeit with modernised vocabulary. It is noticeable that both volumes include a considerable number of chapters devoted to technological questions. By contrast, there is only one chapter on neuroscience (Varma et al., 2018), and none on pedagogical or content-related aspects of learning. These findings are in line with the comprehensive analysis carried out by Nathan and Alibali (2010). Both volumes address the topics listed in Table 2.2 (in alphabetical order).

In principle, they see learning sciences not as an academic discipline but rather as an interdisciplinary field (Sawyer, 2006; Fischer et al., 2018), producing knowledge of different aspects of human beings’ learning. Based on a

Table 2.2 Disciplines and subdisciplines of learning sciences

<i>Psychology</i>	<i>Biology</i>	<i>Education</i>	<i>Technology</i>
Behavioural neuroscience	Cognitive neuroscience	Curriculum studies	eLearning
Psychological science	Cognitive psychology	Open and distance education	Technology in education
Educational psychology		Research methods in education	

comparative analysis, both volumes can be identified as a multi-method, multi-perspective inquiry into understanding and fostering thinking and learning in school and beyond. In order to allow for a direct comparison between the conceptualisation of the sciences of learning in the scientific field and the OECD's understanding of the field, their view is presented later, along with a brief discussion of how the OECD explains and frames its understanding of the learning sciences.

In parallel with phasing-in the PISA surveys (OECD, 2001), in the early 2000s the OECD (2002) began to recommend changes in member countries' curricula for teacher education. The implementation of a new subject was recommended, which should include "elements of cognitive neuroscience: the nature of the brain, how the brain learns" (2002, p. 22). Furthermore, the new subject was to be based on neuroscientific, psychological/medical, and educational diagnostic content (p. 88, 90). The lobbying organisation (i.e. OECD) required nothing less than that future teacher education should be based on a "solid theory of learning" (2002, p. 26). Beyond that, it was argued that both "brain science" and ICT (p. 25) would suggest how "the practice of teaching can better help young and adult learners" (p. 27).

It is noteworthy that the OECD was presenting learning sciences as a homogeneous and established discipline as early as 2002. The suggested subject narrative appears to be transdisciplinary (p. 81) and has the brain as its fulcrum. At the same time, the OECD narrative of the learning sciences links "effective learning" (p. 17) with pupils' achievement of "health, wealth and happiness" (p. 17). This rhetorical juxtaposition allowed the narrative to move ideas of teaching (Didaktik) off centre stage and replace them with ideas of learning (the brain). According to the OECD, all learning must be understood through the prism of neuroscience. Therefore, learning-sciences content is defined as a crucial prerequisite for any reformed teacher education curriculum.

A comparison between the two positions makes it clear that the OECD had created a random, yet easy-to-understand, narrative about learning sciences that did not correspond to an established understanding of the field of learning sciences. The analysis reveals that the OECD adopted an instrumental view of neurobiological knowledge, rather than basing its position on an evidence-based

interpretation of the field. In several respects, the OECD was establishing its own narrative about learning, as distinct from the academic discourse of the learning sciences. Founded in a neurobiological point of view, this narrative defined learning as the solution to the technology deficit of *Pedagogikk*.

Such an understanding of the learning sciences has significant consequences for non-specialists. Given its apparent authority and recognition, it can be assumed that the OECD's learning-sciences narrative will be adopted and implemented by educational and other policymakers. This means that other ways of understanding learning will be treated as invalid. An educational view of teaching and learning is therefore off the agenda. That educational planning is a prerequisite for learning (of a given content) has gone unnoticed.

Is learning the answer in teacher education?

This chapter is based on the assumption that policy documents have an impact on the curriculum as a text for teacher education and that they are an educating and 'governing' force in professionalisation processes. The curriculum as text is a preliminary stage to the enacted curriculum. This section therefore explores the hypothesis that the focus on Didaktik in Norwegian teacher education was modified in accordance with the OECD's interpretation of the learning sciences. This section therefore reveals those curricular aspects of the OECD narrative that can be identified in the new curriculum of Pedagogy and Pupil Knowledge.

To underline that transformation, a brief comparative analysis of key curriculum documents (KUD, 2009, 2016a, 2016b) will be undertaken regarding the frequency of learning-outcome descriptions that use the terms 'learning' and 'teaching'. Here 'learning' is understood as an indicator for knowledge and competence related to psychology, whereas 'teaching' is understood as an indicator for Didaktik. It is important to bear in mind that these teacher education curricula are legally binding documents which define student teachers' expected learning outcomes. The frequency distribution of learning outcomes will therefore indicate whether teacher education is likely to operationalise either the learning or the Didaktik narrative.

Frequency analysis reveals that the term 'learning' (as verb, noun, or composite) is used 25 times in the 2010 regulation, and 20 times in 2017. The term 'teaching' is used three times in 2010 but is not used in 2017. A similar picture emerges from the guidelines for Pedagogy and Pupil Knowledge. In the 2010 documents, the concept of learning is used 49 times and the term 'teaching' three times (KUD, 2009, pp. 16–22). Seven years later, 'learning' is used 33 times and 'teaching' six times (UHR, 2016, pp. 18–22). The proportional comparison underlines the central position of the concept of learning in the curricula. In 2010, the term 'learning' constitutes 3.7 per cent of the guideline text and 3.1 per cent of the regulation text. In 2017, these figures have increased to 4.6 per cent and 3.8 per cent respectively.

The analysis reveals that the concept ‘learning’ (in various forms and shapes) is a dominant term in the curriculum documents. This finding emerges with especial clarity from a comparison with the use of the term ‘teaching’ (*undervisning*), a typical indicator for the Didaktik aspects in a curriculum. As teaching is the main activity in a classroom, despite all other tasks, this finding is quite surprising. The analysis emphasises that the curriculum semantics are characterised by the concept of learning.

To widen our understanding of this transformation, a curriculum analysis is carried out in the following section, applying the narrative historiographic approach.

New content: new curriculum?!

This section endeavours to answer the question of what narrative elements of the OECD’s ‘learning sciences’ approach are to be found in the Norwegian teacher education curriculum (KUD, 2009). The 2010 curriculum was significant in that it introduced a paradigmatic change in the subject of *Pedagogikk*, while the modified plan of 2016 was less significant in this regard (hence its omission here).

Based on a governmental regulation in conjunction with detailed curriculum guidelines (KUD, 2009), the standards-based reform was rolled out between 2010 and 2014. In accordance with the idea that “pre-scientific discipline” pedagogy (OECD, 2002, p. 10) should be replaced by content from the so-called learning sciences (KUD, 2009, pp. 22, 26, 88, 90), the new subject of Pedagogy and Pupil Knowledge was introduced, replacing the traditional teacher education subject of *Pedagogikk* (pedagogy).

The subject of PPK was divided into three modules (totalling 15 credit points). These focus on:

- (Year 1) the teacher as facilitator of pupils’ *learning* and development
- (Year 2) pupils’ academic, social, and personal *learning* and development
- (Year 3) the development of teachers’ professional role and identity

The first topic emphasises that teachers must be able to plan, implement, and evaluate their own teaching. Most interestingly, the narrative of the teacher who teaches has disappeared from the curriculum. The concern is no longer teaching content but how pupils can be made to learn. The teacher is seen merely as an enabler of pupils’ learning. The respective learning outcomes are anchored by the following themes:

planning of *learning* activities, *learning* theory, classroom management, *learning* environment, professional ethics, legislation, beginner training, basic skills, assessment, digital tools and observational knowledge.

(KUD, 2009, pp. 17–18)

Throughout the second year, the focus is on pupils' learning. Pupils are to understand the significance of their fellow pupils' social, cultural, and linguistic heterogeneity. Substantial themes in this topic are:

socialization in different social, linguistic, religious, cultural and media contexts, adopted teaching, cultural, linguistic and gender-related heterogeneity, the child as school beginner, children's language and concept development, gender identity, children in difficult life situations as well as *learning* strategies and meta-cognitive understanding.

(KUD, 2009, pp. 18–19)

In their third year (the last year in which education is the subject matter), student teachers are to learn about the foundations of schooling, school development, and professional ethics. Pupils are expected to learn to:

analyse interactions in classes, stimulate student democracy, carry out development talks, create aesthetic experiences, use local context for pupil *learning*, understand teacher roles.

(KUD, 2009, pp. 19–20)

An overview of the PPK curriculum reveals a clear and striking focus on training student teachers to understand teaching as indistinguishable from learning. Furthermore, student teachers are to learn skills that will help their pupils achieve learning outcomes. To this end, they are to learn psychologically based concepts of learning. Pedagogy in this setting is reduced to 'educational diagnosis', the task of which is to identify learning disabilities or learning obstacles.

The findings document that the Ministry of Education sees the primary objective of the PPK subject as to enable student teachers to diagnose and interpret their pupils' learning needs. The learning-outcome descriptors of the curriculum suggest that Norwegian teacher education institutions must accept the idea that teachers are to be 'equipped' with learning-science knowledge (KUD, 2009, p. 17).

The success of this strategy is documented by a recent teacher education curriculum analysis. It shows that the course syllabus in about 80 per cent of Norwegian teacher education programmes (that is, in 38 programmes) contains learning-outcome descriptions regarding learning-science knowledge, competences, and generic skills (Werler et al., 2012). Almost all institutions have implemented learning outcomes regarding the planning of learning activities; the theory of learning; classroom management; the learning environment; socialisation in various social, linguistic, religious, cultural, and media contexts; in adopted teaching; and in cultural, linguistic, and gender-related heterogeneity. About 50 per cent of these institutions have introduced topics such as planning of learning activities, professional ethics, and evaluation and assessment.

Section four: the new learning narrative

This final section discusses empirical findings that acknowledge the fact that any (hi)story of change must always consider a comparison between previous and current states. The discussion therefore begins by focusing on the achievements of the narratives in teacher education.

Didaktik narratives in teacher education function as holistic, and therefore powerful, stories about how to hand down cultural assets from one generation to the next. Didaktik appeals to both the imagination and the visualisation of the student teacher. This gives the narratives a power to go beyond what facts alone can convey. Both imagination and visualisation create a rich and imaginative experience, showing a coherent and meaningful solution to typical problems of teaching and learning. Even if Didaktik competence can be seen as similar intuition-like, it supports the profession's specific capability to make important classroom-relevant decisions (Kroksmark, 1997; Kahneman and Frederick, 2005; Myers, 2002). It helps teachers in sense-making, in understanding situations related to their teaching. Didaktik competence allows teachers to teach in the complex and changing world of schools and classrooms, a world that is determined by uncertainty and contingency. Beyond this, teacher education based on the Didaktik tradition prepares student teachers to adjust the corresponding scope of teaching in an intuitively meaningful way if a classroom situation is experienced as broken, or if a teaching sequence no longer works. Didaktik competence supports teachers in improvising reflectively and intelligently (Werler, 2015).

As shown, the Didaktik narrative is able to address the ill-defined problem of education at the level of content. Didaktik narrative enacted in teacher education supports the transformation of the ill-defined problem into a better-defined model of the relationship between teaching and pupil learning. Such a model explains how teaching generates learning of a particular content in a way that pupils will experience as meaningful to them. It reveals the principles of meaning-producing actions, and it triggers pupil learning and growth. In short, teachers' Didaktik knowledge helps them bridge the gap between pupil learning and the world from which that learning is separated.

The argument of the OECD in advocating change in the school curriculum so as to focus on increased teacher efficiency was that education knowledge was "pre-scientific" (OECD, 2002, p. 10). This argument denied education its scientific standard. It was argued that the knowledge base in education does not stem from an autonomous discipline and has no specific theoretical foundation (p. 10). This criticism alone might lead us to expect that the OECD's learning narrative will be clearly reflected in the curriculum.

The preceding analysis demonstrates that a strong narrative about 'learning' is constructed in the curriculum of teacher education. In particular, it indicates that it is doubtful how far the OECD narrative actually applied to teacher education in Norway at the beginning of the third and last reform wave. It is also

doubtful whether the OECD has succeeded in establishing a ‘solid theory of learning’ in the teacher education curriculum. The OECD reading does not seem to have been fully accepted by Norwegian teacher education stakeholders.

The Didaktik narrative – judged by the OECD as an art, not a science (OECD, 2002) – still holds a strong position in the Norwegian curriculum. This is already evident in the cautious renaming of the subject *Pedagogikk* as Pedagogy and Pupil Knowledge. The fact that knowledge about pupils (Pupil Knowledge) has been added as a supplement to *Pedagogikk* indicates that Didaktik is recognised as a scientific language about pedagogy and pedagogical actions.

Even though the OECD’s proposal to institutionalise neuroscientific, psychological/medical, and educational diagnostic content has not been realised, it cannot be denied that Norwegian teacher training is now partly following a new paradigm in which shared content has been supplemented or exchanged. The blurred understanding of Didaktik may in fact have favoured its survival. At the present time, the linchpin of Pedagogy and Pupil Knowledge is a new learning narrative that approaches learning from multiple perspectives. It is unclear, however, how knowledge about learning is ultimately operationalised in the practical work of teacher-educators. The extent to which Pedagogy and Pupil Knowledge is capable of providing a new conceptual frame – a new knowledge architecture – for teacher education requires examination. The following section discusses some consequences, both intended and unintended, of the recent reform wave.

Achievements and challenges: the new learning narrative in teacher education curriculum

As the analysis reveals, these two conceptualisations of the curriculum for pedagogical studies in teacher education are markedly different. Today, the PPK curriculum stands out as a hybrid construct, amalgamating Didaktik with knowledge about learning. Given that the curriculum’s new narrative represents various stakeholders’ interests in teacher education, it should safeguard it as well as seemingly replacing it. It seems reasonable to assume that this double-bind situation is holding the new subject back (and equivalent subjects in Denmark and Sweden) from developing as a nave of teacher education.

Another consequence has been the fragmentation of the knowledge domains in the PPK curriculum. This raises the question whether general pedagogical theories and theoretical knowledge and learning topics can be sufficiently covered in teacher education. Furthermore, in PPK, student teachers encounter the different languages of Didaktik and the learning sciences. This makes the development of a developed professional language supporting student teachers transformation in public good professionals unlikely.

The OECD’s proposal on learning sciences has weakened the position of Didaktik in teacher education curricula. Although the objective of anchoring its learning-sciences narrative has not fully succeeded, its advocacy by the

OECD triggered the creation of a learning narrative in Norwegian teacher education curriculum. Various learning–outcome descriptions about the process, the function, and the value of learning have now become part of the PPK curriculum. This narrative tells a different story about how learning happens and how it should be supported.

Compared to the Didaktik narrative, the new learning narrative has not proved capable of achieving a powerful or holistic language capable of describing how to choose and unfold content for the younger generation. The learning narrative is also over-strained when it attempts to explain how pupils are to experience meaningful learning. In short, the learning narrative does not support student teachers in transforming disciplinary knowledge into something that is teachable and relevant to pupils.

The problem with the learning narrative is that it presents learning as a technical, controllable capacity. Learning in teacher education practice can therefore be presented as a technical problem. Since the problem is presented in a scientific context, student teachers might be expected to be offered corresponding solutions to the problem. But the conflation of object and method into one is not sound epistemological practice, because it leads to the misconception that if learning is the problem, then learning is the solution. Such an approach does not support teachers' autonomous decision-making as is required in situations of unpredictability.

An obstacle to the learning narrative lies in the fact that it does not help to contextualise pupil learning. Hence, it cannot explain what teaching method is suited to what pupils. Another obstacle to the learning narrative is its focus on the individual's learning. This obscures that learning happens only when teachers teach school classes. The perspective that learning in school is a collective activity is absent.

As for the professionalisation of teachers, learning is presented as the *ultima ratio*. Making pupils learn is described as the aim of teaching (regardless of what is to be learned, how, or why). The learning narrative, as expressed in the PPK curriculum, therefore has the potential to distract from the actual task of teacher education: that is, learning to develop teaching and learning to teach. To assume that learning is something that pupils do may reflect the naive everyday learning experiences of stakeholders in teacher education, but those beliefs do not provide viable concepts for how to teach other people's children.

Outlook

Narratives are powerful stories that help people to coordinate other people's mindsets, knowledge, beliefs, and convictions. Narratives trigger the imagination and have the power to create future realities. In so doing, they create a virtual reality that can both address problems and simulate ideal solutions.

Regarding the new subject of Pedagogy and Pupil Knowledge, it can be stated that its curriculum addresses the political demand for the minimisation

of ontological uncertainty for the teaching profession. But the implementation of the new narrative has placed knowledge domains stemming from brain science or incompletely developed learning sciences in a position where they can impact the core of teacher education.

From the outset, the learning narrative merged several quite antagonistic narratives. It is reasonable to argue that this course was chosen in order to prevent teacher education from running into a dysfunctional situation in which a new narrative was to take over from a narrative disparaged as ‘pre-scientific’.

Be that as it may, teacher education in Norway seems to have ended up with a curriculum that is a palimpsest of broken narratives. Despite all the changes, the question of what knowledge of pedagogy future teachers need to have in order to develop and deliver good teaching remains unresolved. It is highly probable that the fact that the reform was conceived by actors outside teacher education who do not recognise national knowledge traditions as valid is a central reason for this.

As a final note: if learning is the answer, what was the problem in the first place?

Note

- 1 Especially in central and northern European teacher education, Didaktik (as subject matter and research field) has addressed the ill-defined problem of education (Hopmann, 2003; Werler, 2015). For a more elaborate discussion of the differences between Didaktik and Anglo-American research on teaching and learning/curriculum research, see Gündem and Hopmann (1998), Hamilton (1999), Kansanen (1995), Nordkvelle (2003). Krogh, Qvortrup, and Graf (this volume) have elaborated on translation issues and the difference between the English word ‘didactic’ and German ‘Didaktik’. Their argument is followed in the present chapter.

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