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Schneuwly, Bernard

DIDAKTIK AND CURRICULUM IN ONGOING DIALOGUE

Edited by
Ellen Krogh, Ane Qvortrup, and Stefan Ting Graf

Didaktik and Curriculum in Ongoing Dialogue

Didaktik and Curriculum in Ongoing Dialogue revives the dialogue between the continental European Didaktik tradition and the Anglo-Saxon tradition of curriculum. It highlights important research findings that bridge cultural differences and argues for a mutual exchange and understanding of ideas.

Through analyses of shared conditions and cultural differences, the book invites a critical stance and continued dialogue on issues of significant importance for the current and future education of children and young people. It combines research at empirical, conceptual, and theoretical levels to shed light on the similarities between the Didaktik and Anglo-Saxon educational traditions, calling for a comprehensive understanding of teaching and a renewed focus on content and knowledge.

Addressing theoretical issues within contemporary educational scholarship, the book will be of great interest to academics, researchers, and postgraduate students in the fields of curriculum studies, education theory, and comparative education.

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Chapter 8

'Didactiques' is not (entirely) 'Didaktik'

The origin and atmosphere of a recent academic field

Bernard Schneuwly

Switzerland, as many know, is a multicultural country where different languages and cultures coexist and meet. And so, also, do the francophone and germanophone cultures of 'didactique/Didaktik'. At encounters where researchers of both communities interact – and they have to do so in order to develop the academic field of 'Fachdidaktik/didactique disciplinaire' on a national level – it is immediately noticeable that their main research interests do not coincide. 'Competence' and 'competence models', for instance, are at the core of German-speaking colleagues but a topic almost absent on the French-speaking side. Thorough analysis of what happens in ordinary classes with the taught contents is a common topic in the 'didactique' of Suisse romande, whereas reform and intervention in order to transform school practice is much more of a preoccupation of the 'Didaktik' in the Deutschschweiz.[1] This difference is linked to the fact that both sides refer to their respective francophone and germanophone communities and are also part of two wider scientific cultures.[2] Taking this difference as its point of departure, the present contribution tries to shed a little light on the francophone community and scientific culture in 'didactique disciplinaire'.

As can be seen, the preceding paragraph and the title of this chapter make use in part of French (and German) expressions: indeed, 'didactics', as one knows, is a *plurale tantum* and as such cannot express the fact that there is a scientific field 'didactique' which itself contains, for instance, 'la didactique du français' (French didactics, in the singular) and many others, too, namely 'les didactiques disciplinaires' (disciplinary didactics, in the plural).[3] In addition to this, the word 'disciplinaire' refers to 'school subjects', that is, to ways of organising knowledge[4] in order to make it teachable. These preliminary remarks show that there are cultural differences in the ways of thinking about school, knowledge, teaching, and learning through teaching[5] that are crystallised in different languages. In a certain sense, the mere fact of writing in English sets limits on the possibility of transmitting what 'didactiques disciplinaires' – henceforth the expression 'disciplinary didactics' will be used – in francophone countries might mean. The more so as the francophone scientific community working in this domain is quite important and has been producing knowledge for some 50 years and in consequence of numerous different orientations.[6]

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Although there is no 'école francophone', no 'French school' in disciplinary didactics, it is nonetheless possible to describe something like an 'atmosphere', a common feeling that allows researchers to communicate across school disciplines and tendencies. This is because common concepts exist to which most of them refer in one way or another. One reason for this is, in turn, that the origins of many francophone disciplinary didactics have something in common. This text begins therefore with some of the characteristics of these origins that allow us to understand some dimensions of the particular atmosphere. In so doing, it contributes to the discussion in the present volume in a specific way. Its central aim is to shed some light on what 'didactique' can mean – on a way of thinking about this domain which differs for historical and cultural reasons from 'Didaktik', one of the two central concepts of the dialogue analysed in the volume. 'Didaktik' is one educational tradition of didactics; 'didactique' is another, with other roots, other cultural references, other histories. Becoming aware of these traditions does indeed give the "chance of becoming aware of ourselves as historical and cultural constructions" (Tröhler, 2014, p. 65). To put it in another way: the dichotomy to which the phrase 'Didaktik and curriculum' points has as its background an antithesis between continental European and Anglo-Saxon traditions. This is the way the discussion has been led up till now; but this dichotomy has to be specified. One way to do this is to integrate 'didactiques disciplinaires' and their specific context, linked also to an educational tradition which differs from (yet at the same time is similar to) the German and, more generally, the north and central European one and its important reference to Bildung. In the first part of my chapter, I will describe some elements that explain how and why 'didactiques disciplinaires' emerged in French-speaking countries, and what is their background. This is a way of contributing to the dialogue between *Didaktik* – in a new and larger sense – and curriculum,[7] which forms the topic of the present volume.

In the second section of my chapter, I will present what I have called 'atmosphere'. What does it mean to describe an 'atmosphere' in a scientific field? Giving answers to questions like the following allow us to characterise an atmosphere in a scientific community, in an 'academic tribe' as Becher (1989) calls it. What kind of questions do researchers ask, mostly? What are the most common interests? Which notions and concepts do they use regularly? What kind of contradictory debates draw people in? In order to give elements of answers to these questions on a more specific level, I have drawn on two journals dedicated to (disciplinary) didactics in general, *Éducation et didactique* and *Recherches en didactique*, the synthetic presentations of particular didactic disciplines mentioned in note 6, descriptions of various didactic domains collected in the collective volume entitled *Les didactiques en questions: état des lieux et perspectives pour la recherché et la formation* (Didactics in question: state of the art and perspectives for research and training; Elalouf et al., 2012) and the *Dictionnaire des concepts fondamentaux des didactiques* (Dictionary of the fundamental concepts of didactics; Reuter et al., 2013).

'Didactiques disciplinaires': origin and background

The driving forces of a new academic field

Two driving forces contributed to the development of disciplinary didactics (see Hofstetter and Schneuwly, 2014). The first one was the tertiarisation of teacher education: on the one hand, the education of primary school teachers was systematically transferred from normal schools to higher education institutions; on the other, the professional dimension of secondary school teacher education was taken over by universities or, if already governed in that institution, greatly strengthened. What does 'higher education' or 'university education' mean? Two elements are essential: the systematic articulation between research and education, and a deeper articulation of education and practice. In the teaching profession, knowledge (in the broad sense defined earlier) that is to be transmitted from one generation to the next is at the heart of its practice. Since the linking of research and education is one specificity of university education, it was necessary to develop a disciplinary field that was centrally concerned with the processes of the dissemination and transmission of knowledge in schools and other institutions, namely disciplinary didactics. In many European countries, this field was indeed developing in direct connection with the construction of teacher education institutions located at the tertiary level. This was the first driving force behind the development of disciplinary didactics.

The second driving force is an indirect effect of what we may term the 'massification of secondary education', which was an essential feature of the transformation of school systems in many countries from the late 1950s onwards (see e.g. Kamens and Benavot, 2007). In accordance with variable rhythms and forms, more and more students – often, all of them – are following so-called secondary studies, with a more marked organisation into disciplines and teachers trained as secondary teachers. This implied, and was accompanied by, a profound reconfiguration of all curricula.

Francophone disciplinary didactics – and this may be a distinctive feature that explains the particularities of the field in the context of the more general educational dimensions that we explain later – have their origin also in this process of transformation: that is, in the analysis of the inadequacy and the partial failure of curricular reforms as an effect of two illusions (Johsua and Dupin, 1993). The first of these, the *lyrical illusion*, arose from the fact that in the reference disciplines of school, new theoretical approaches were developed which explain complex phenomena starting from relatively simple basic assumptions. Precisely because these are relatively simple – although abstract – and because they were regarded as the first, genetically primitive elements of logical developments that can explain complex phenomena, these seemed to be ideal objects for introducing students to, for instance, grammar or mathematics. A pre-established harmony between the construction of scientific knowledge and the ways of its acquisition was postulated. The *romantic illusion*

was Rousseauism, which sees development as a natural process and one that education and training can only accelerate or slow down. According to this approach, knowledge of the child's spontaneous development (which is elaborated by psychology) allows the possibilities and limits of teaching to be determined. Education as such, conveying concrete cultural content to the child, has little influence on development. In this context, didactics called into question the traditional dependence of pedagogy and educational science on psychology. The development of disciplinary didactics was based, among other things, on the postulate that the relationship between teaching and development must become the object of research, with teaching being regarded as an element *determining* development. It is from this point of view that certain questions can be asked about, for instance, the development of formal concepts, or about complex cultural techniques such as reading and writing, which are difficult to address in the paradigms of spontaneous development.

'Didactique': a term for combatting

The attempt to overcome both lyrical and romantic illusions is concretised in didactic research approaches. These differ from discipline to discipline, but common basic assumptions can nevertheless be recorded for most of them (Raisky and Caillot, 1996). It is assumed that the didactic system, with its three poles – *students*, with their knowledge and skills; *content* that is to teach and to be learned (*savoirs*), their history, and their place in the system of the school disciplines; and *teachers*, with their historically grounded practice, ideas, and gestures – is the central object of research. In disciplinary didactics, the *savoirs* – 'knowledges' in the sense defined earlier, the objects of teaching – are of central importance. This is so not in the sense of 'dead' objects taken directly from academic disciplines, nor objects that are appropriated as such by students, but objects that are constantly renegotiated in the interaction between object, student, and teacher. The analysis and criticism of curriculum reform and the transformation of content linked to changes in the school system were thus the starting point for the constitution of disciplinary didactics as academic disciplines. Examples include 'modern mathematics' (Brun, 1996; Margolinas, 2005; Dorier, 2008), the 'communicative turn' in first- (Bronckart, 1985; Chiss, David and Reuter, 1995) and second-language teaching (Coste, 1994), the 'dominance of the humanistic model' in arts education (Gaillot, 1997; Mili and Rickenmann, 2005), and 'sportivisation' in sports education (Amade-Escot and Marsenach, 1995). Here, it is not so much the reforms as such as the limits they encounter, even the failures they suffer, that impose new forms of reflection on contents. To put it in Margolinas' words:

> One of the originalities of the French research paradigm in mathematics didactics [and this is true also for other disciplinary didactics] is that it takes basic research seriously, and not directly the success of students. It is a

> question of seeking conditions that *in theory* allow students' knowledge to evolve and not only that *actually* improve teaching.
>
> (2005, p. 345; my translation)

Disciplinary didactics is a descriptive and explanatory science. The existence of a strong tendency to this kind of approach, besides of course a didactic of intervention tending to promote reforms and innovation, is a central aspect of francophone disciplinary didactics as academic disciplines. And even didactic engineering is very often understood not primarily as a means of changing teaching practice but as a basis for experimental research into the conditions of teaching and learning.[8]

In a certain sense, in francophone countries the word 'didactics' was invested as a term for combatting, as a combat term, exactly as did Rathke and Comenius, the inventors of the Latin 'didactica', who used it in their combat against feudalism through education for all (Schneuwly, 1990). This was possible for at least two reasons. First, the word 'didactique' was not really used in the discourse of educational sciences and could therefore be used freely. Almost absent in France, it was used in the *écoles normales* of Belgium or Switzerland in the context of the education of future teachers in methods of teaching. 'General didactics' did not exist as an elaborated theory as it did in Germany (Schneuwly, 2018a). Scientific approaches to the teaching of subject matters were generally called 'psychopédagogie': the 'psychopédagogie des mathématiques', for instance, heavily involved in the modern mathematics reform mentioned earlier and influenced also by Piaget (Brun, 1996). From a scientific point of view, the term 'didactique' was at disposal: it was clearly different from 'pedagogy' but nonetheless usable in the context of the educational sciences where disciplinary didactics as academic field was often institutionalised. The second reason was that 'didactique' – unlike 'Didaktik' – was not dominated by the reference sciences; it did not develop in the context of – and generally in dependence upon – physics, history, or linguistics. Psychologists and educationalists too could become didacticians: among the most famous didacticians were, for instance, Gérard Vergnaud in mathematics, a psychologist formed by Piaget, or Frank Marchand, primary teacher and later director of an école normale, in French as mother tongue. This also meant that research in didactics included all school levels, without any distinction.

Disciplinary didactics can be seen as the construction of a generation formed after 1968 in the social movements of the 1970s. They were often political militants, teachers in primary and secondary schools involved in school reforms; many of them belonged to the communist party (they quite rapidly quit). They had to find their way between three dominant poles in the educational debate. The 'instrumentalist' pole (Young, 2008) became dominant in the official discourses, but also, in attenuated form and for other purposes, in progressive conceptions of education. Education here was conceived of as being closely linked to everyday knowledge, knowledge of action and experience. Epistemologically,

this conception of knowledge is commonly based on a (socio-)constructivist, even post-modernist vision of knowledge which makes it dependent on action and experience, on the needs and interests of each individual. The possibility of knowing, and therefore the objectivity of knowledge or even its claim to truth, is thus relativised. The instrumentalist vision is sometimes accompanied by a differentialist, even individualistic, vision of the acquisition of knowledge, with each person ultimately constructing knowledge according to his or her own needs and path. The individual thus becomes responsible for his or her own training, for better or for worse. The second, 'neoconservative' pole – its defenders in France often call themselves 'républicains' – under the guise of defending knowledge, supports an immutable and objectively elitist form of it. Here knowledge is conceived of as given once and for all and defined essentially by tradition, insensitive to any change in the social context. Knowing and knowing how to teach are one and the same: the problem of transforming knowledge to make it teachable does not exist; and its 'elementation' is conceived as a simple mechanical procedure that at the same time defines a linear progression in a transmissive teaching that appeals above all to the teacher's charisma. Although the approach is not differentialist, the individual is, again, primarily responsible for his or her learning process. In such a conception, professional knowledge about school, social determinants of learning, about pedagogy is useless. The third pole, close to the first one but acting on the level of the school system, aims to control its output through the concept of competence. In the French-speaking area, 'compétence' was criticised by many researchers in didactics from the very beginning of its use in schools; it is understood as the school's orientation towards the market and economy. Researchers analyse the international triumph of the term as explained by three processes: the marketing of the school, the development of psychometrics, and new types of management.[9] Ultimately, this approach is about the possibility of measuring the output of the school system. This is made possible and strengthened by the concept of competence, but it also includes control of the teacher's actions from outside, and therefore ultimately a weakening of the teaching profession.

These three poles come together in a vision that reifies the knowledge that is to be taught. Everything happens as if this knowledge should represent knowledge as such, both in everyday life and in science and tradition, without the need for didactic transposition: without, that is, the transformation of knowledge for teaching and through teaching, and through learning on the basis of teaching. These questions are at the core of disciplinary didactics: how does knowledge – 'savoirs' – become teachable and learnable through teaching? How is it taught and learned through teaching?

Instruction and the central place of the 'savoirs'

It is most probable that this way of thinking about education is deeply rooted in a deeper layer of educational tradition. This tradition, insisting heavily on what

in French is called 'instruction', is embedded in the thinking about education and the particular relationship to school.[10] Once again, the word 'instruction' has a very different meaning than in English: more generally, 'instruction' in French means the transmission of 'savoirs', knowledge and know-how, the acquisition of which enables the ability of free judgement with regard to all knowledge and also to all laws and constitutions. It is in this way that people can participate in the culture of which knowledge is both expression and motor (Hameline, 1999). The decisive point here is that public education must be limited to 'instruction': that is, to the imparting of knowledge and know-how.

One cannot help but relate this concept of 'instruction' to Humboldt's concept of 'Bildung', elaborated at exactly the same time, in 1791, as Condorcet's 'instruction' (Schneuwly, 2018b). Of course, the concepts have been fundamentally transformed through history (Horlacher, 2016; Hameline, 1999). But they continue to influence the way education is conceived of and to give an insight into fundamental differences. The conceptions of Humboldt and Condorcet pursue similar goals but are fundamentally different. What they have in common is the right for everyone to embrace as much knowledge and ability as possible, and thus make democracy and freedom possible for everyone. But Humboldt's starting point and point of view is the developing person; Condorcet's, the knowledge of the 'citoyen' that is necessary for democracy and society. Humboldt speaks of mind, whereas Condorcet is concerned with 'raison' (reason/understanding). School is rather an 'adjuvant' for the first, the decisive condition for democracy for the second.

In combating for the centrality of knowledge, 'savoirs', in thinking about school, didacticians continue to think in the tradition of Condorcet. But contrary to the concept of diffusing knowledge from top down, which is implicitly Condorcet's approach – a necessity during the French Revolution that he justifies by his theorising of democracy, with its mathematical foundation of voting – the didacticians' grassroots origin let them adopt a bottom-up strategy, with the teaching profession as central lever. One could even say that disciplinary didactics originated as a sort of social movement before it ever acquired the emblems of an academic discipline.

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But then: how were these academic disciplines – the 'didactiques disciplinaires' – constructed? There is no doubt that mathematics didactics, the first to be institutionalised with a specialised scientific society and an academic journal at the beginning of the 1970s, played the role of forerunner and produced strong, coherent theories whose concepts then spread among other disciplinary didactics. Among these, one was Brousseau's theory of didactic situations, with concepts like (didactic) milieu and didactic contract (2006); another, Chevallard's theory of anthropological didactics (heavily influenced, by the way, by Althusser's theory of ideology), with concepts including the didactic system, the noösphere, meso-, topo- and chronogenesis and, above all, didactic transposition

(Chevallard and Sensevy, 2014). These concepts will be discussed in more detail later in the chapter. In other disciplinary didactics, such concepts as epistemic obstacle (in the natural sciences) or double semiosis (in French first-language didactics) were introduced. All these concepts are generic and can be used in different disciplinary didactics, with specific meanings depending of the specificity of each disciplinary didactics. This is the landscape in which a common didactic atmosphere can coalesce, superseding all essential differences. In order to give an idea of the research done in francophone disciplinary didactics – to give an idea of this 'atmosphere' – two central concepts used by most researchers at one or at another moment, will serve as guides: didactic transposition and didactic system.

The conceptual atmosphere of French disciplinary didactics

Didactic transposition and didactic system

The concept of didactic transposition (Chevallard, 1985) played an essential role in the theoretical constitution of the discipline 'disciplinary didactics' because of its claim of autonomy. Here is one of many definitions:

> The transition from knowledge regarded as a tool to be put to use, to knowledge as something to be taught and learned, is precisely what I have termed the *didactic transposition* of knowledge.
>
> (Chevallard, 1989, p. 58)

Useful knowledge – knowledge that is to be used in various situations of research and of action – constitutes a point of reference, a starting point for the knowledge to be taught. This latter includes scientific knowledge in the context of its use in research practice but also expert knowledge in various social practices such as writing, music, or technology, for example. In institutions which specialise in education and teaching, this scholarly or expert knowledge first becomes knowledge to be taught and learned, then becomes taught and, hopefully, learned knowledge. Through this change in institutional location, its meaning changes deeply: from knowledge to be used in various contexts, it becomes objects to be taught and learned. This 'transposition' transforms it fundamentally, necessarily, irremediably – not at all in the sense of a simplification (a spontaneous, habitual conception of this transformation adopted by many researchers) but in the sense of a reconstruction, a rebuilding of knowledge[11] in order to achieve other goals: to allow its appropriation by students, which has as its aim the deep change of the ways in which individuals think, speak, and act. The process of didactic transposition can be represented by a small diagram (see Figure 8.1).

As stated already, it is not just scientific knowledge that is transposed but also social practices of reference (Martinand, 1986). Education systems mediate and

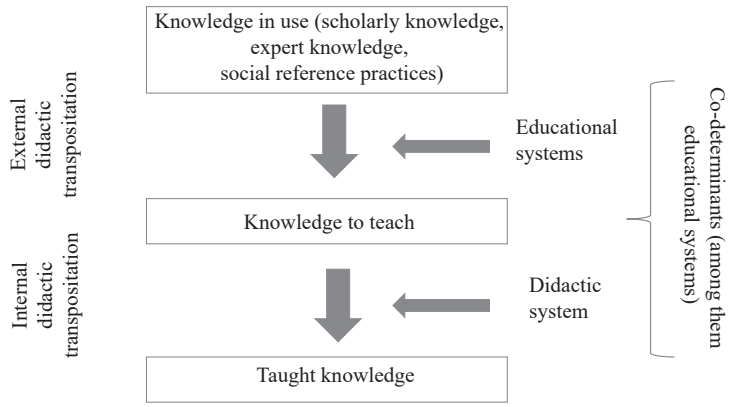

Figure 8.1 Schema of didactic transposition

transform knowledge through the intervention of multiple actors – teachers, pedagogues, didacticians, educationalists, members of the administration, representatives of the political sphere – generally speaking, what Chevallard calls, somewhat ironically, the 'noösphere', the sphere that thinks. These actors have divergent, sometimes contradictory interests. For the school discipline 'economics', for instance, some of these actors wish to define knowledge so as to build good consumers, whereas others wish to train critical citizens for whom some possibility of distance from consumption is possible (see Beitone et al., 2013). The construction of knowledge to be taught constitutes the first level of the didactic transposition: the external transposition.

What happens with the knowledge in this external didactic transposition? Three processes are particularly important, theorised in numerous studies in different disciplines (for instance natural sciences in Marty, 2019; earth sciences in Roubaud and Dupin, 2003; French as first language in Bronckart and Plazaola Giger, 1998; sports education in Lenzen and Cordoba, 2016; social and economic sciences in Beitone et al., 2013; visual arts in Fabre, 2015):

- Desyncretisation: knowledge is cut off from its original use, and this transforms its meaning for students and teachers.
- Programmability: objects of teaching are 'elementarised', cut into significant elementary units and organised in a progressive sequence; they are 'didactically modelled', fundamentally reconfigured to become teachable.
- Publicity: the objects of teaching are made explicit and public, and become a contract between teacher and learner.

The second level of didactic transposition is internal. It is the process through which the objects to be taught – which are the product of the external

transposition that materialises in 'programmes d'études' (study programmes, *Lehrpläne*), in textbooks, but also in the professional journals and the discourses of the teaching profession – enter the classroom and become the object taught through the interaction of the three poles of the didactic system: knowledge and know-how, students, teachers. This is another constitutive concept of disciplinary didactics:

> To posit the existence of a ternary didactic system, as opposed to the dual model of pedagogy and educational psychology, seems to me to be one of the founding acts of disciplinary didactics.
>
> (Schubauer-Leoni, 1998, p. 274, my translation)

In the didactic system, the objects of teaching are continually negotiated as teaching and learning progresses: teachers propose an object to be learned, students resist it, do not immediately understand it, interpret it, often add unexpected dimensions. All this has the effect that the object to be taught evolves: it becomes the object *really taught* in a classroom, a progressively changing one. And it is this process whose theorisation, description, and explanation constitutes a central object of research in francophone didactic, as we will see.

As Figure 8.1 also shows, the didactic transposition, mediatised at the external level by the educational systems and at the internal level by the didactic system, is moreover subject to multiple co-determinations: by the school discipline, by pedagogical theories, by the given society as a whole.

The (historical) analysis of the objects to be taught as products of multiple determinations (external didactic transposition)

An important object of francophone didactics is indeed the (historical) analysis of the objects to be taught as products of multiple determinations: that is, of the external didactic transposition.

A small example of analysis can illustrate the ways of thinking in the context of the theory of external didactic transposition. A well-known text by Voltaire, originally entitled "De l'horrible danger de la lecture" (On the Horrible Danger of Reading), in the textbook became "Le palais de la stupidité" (The Palace of Stupidity): an astonishing transformation, one has to understand. The page includes a series of typical textbook features. The numbering of lines, for example, is used to interpret and explain texts in class by referring to specific passages. At the top of the page, there is a general title, "Arguing with Irony": obviously, this gives both page and text a general orientation. One could continue the analysis of the characteristics of this external didactic transposition, that is, the passage of a reference text that is a great classic and plays an important role in literary studies and in literary criticism, perhaps even in everyday practice, to an object to teach in a textbook (for more details, see Aeby Daghé

and Schneuwly, 2012). The analysis of the external transposition can be done on three levels (a common approach in didactics): at the micro-level (for example, numbering and its rationale), at the meso-level (for example, the place of the page within a textbook, its function in the teaching of literature, and the uses that can be made of it in the didactic system), and on the macro-level of the meaning of the page according to the co-determinants (the discipline, the social purposes of literature, the place of literature in society). Figure 8.2 is a schematic representation of such an analysis.

It can be shown that this text is the result of the superimposition of two opposite teaching paradigms: two different historical paradigms of teaching literature appear in one and the same book, on the same page. On the one hand, one finds the teaching of hermeneutic reading called 'explication de texte', with which all French-speakers who have studied in the lycée in France or in the gymnase in Switzerland are familiar. On the other hand, another paradigm of teaching is superimposed, namely communicative reading oriented towards argumentative processes. A pursuit of the macro analysis in detail could demonstrate that the hermeneutic reading is part of the struggle against the dominance of rhetoric in the nineteenth century. It is an essential aspect of the emergence of literature as a social field in the course of the nineteenth century, as Bourdieu (1992), for example, shows. The other teaching paradigm can be interpreted as the reappearance of rhetoric as part of the transformation of the school discipline French in the 1970s: the dominance of communicative approaches. But the appearance of a new paradigm, as always in human practices, does not make a clean sweep of the other: it superimposes itself upon it. Practices are thus the product of sedimentation processes (Ronveaux and Schneuwly, 2018), new layers being added

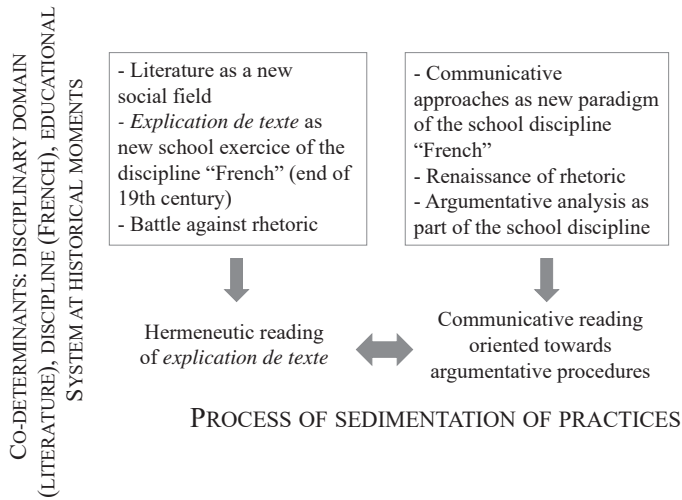

Figure 8.2 Analysis of the didactic transposition: a text by Voltaire and its co-determinants

on top of old ones while mixing with them in a thousand ways. The analysis of the external transposition of Voltaire's text is an example of the presence of different historical layers of teaching practices in the same synchronic moment.

The analysis of the functioning of the didactic system: one of the central tasks of didactics (internal didactic transposition)

The analysis and modelling of the actual functioning of didactic systems is another central area of francophone disciplinary didactics: bits of lessons, a whole lesson, sequences of lessons, but also lessons by teachers over a whole year are observed, described, and analysed. The approaches are essentially comparative in nature: different school levels, contrasting teaching objects, varied school disciplines, different countries and/or cultures, and so on are subject to the analysis. Before offering some examples, here by way of illustration in a list of a series of concepts used to analyse the functioning of the didactic system from the point of view of the three poles that make it up (see Figure 8.3). It is of course not possible to explain all these concepts here: the *Dictionnaire des concepts fondamentaux des didactiques* (Cohen-Azria et al., 2007) can provide an overview, albeit limited.

It is important to stress that in fact each concept always implies all three poles. But one can – albeit artificially – determine a major point of view that each concept privileges, the didactic contract being the central linking element. During a session whose purpose is to teach students a specific content knowledge (a didactic situation), the student interprets the situation presented to him/her. The didactic contract is the rule for decoding the didactic activity

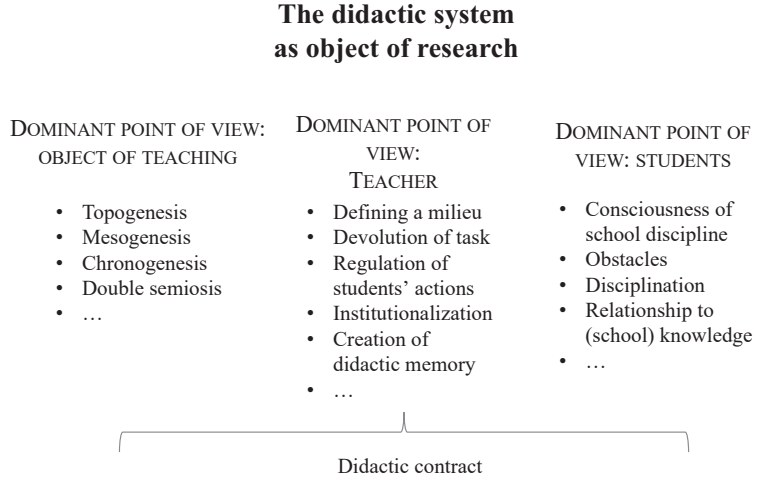

Figure 8.3 Concepts for analysing the functioning of the didactic system

through which school learning takes place. The usual and specific uses of the objects present in the task – the didactic contract – guide the students' interpretation of what is to be done in the situation. The didactic contract is an evolving interpretative framework that allows for the negotiation of the meaning of objects of teaching by students and teacher.

From the point of view of the object of teaching, the concept of double semiosis defines the object of teaching: it sheds light, on the one hand, on how the teacher introduces an object as being the one of the common work to come, how she/he makes it present, 'presentifies' it – a semiotic act; and on the other, it elucidates how she/he comments, describes, stresses one or another aspect of the object for the students – another semiotic act. The three geneses allow understanding of how the object of teaching evolves in function of time, milieu, and the relationship between students and teacher. From the point of view of the teacher, the researcher's attention can be oriented towards the didactic milieu in which the teacher places the students to act, or to the modes of regulation of their action, or to the fact that the teacher gives the students the responsibility for learning (devolution), that she/he institutionalises knowledge and creates memory about it. From the point of view of the students, we can, for example, analyse how they are 'disciplined', that is, how they can appropriate the disciplinary tools (concepts, ways of speaking, diagrams, maps, etc.) in order to learn to act, speak, and think according to the modalities of the school discipline into which they are gradually introduced; but we can also look at the epistemic obstacles of the objects of teaching, or the students' consciousness of the school discipline in which they are involved, something that heavily influences their relationship to the disciplinary knowledge.

In order to give a more concrete sense of the work that can be done with these concepts, I draw on their definition and global use in three doctoral theses to shed some light on the atmosphere of didactic working. The theses were chosen in order to illustrate each point of view through one concept and through the analysis of contrasted disciplines.

The first thesis illustrates chrono-, topo-, and mesogenesis as a productive triplet. How do teachers teach the reception of musical oeuvres, for instance Smetana's *Moldau*, with ten-year-old students (Maizières, 2016)? The knowledge 'to be taught' – the oeuvre to be studied – is chosen and presented by the teacher, but the 'taught' and 'learned' knowledge is co-constructed during didactic interactions. However, on the students' side, we can only observe the signs they show, notably the words they express about the work; this expression is guided in a milieu strongly organised by the teacher. Thus, the analysis of verbal interactions will focus more particularly on the three geneses: the milieu ('mesogenesis' – mesos = milieu), the didactic time ('chronogenesis'), and the places and responsibilities of each person ('topogenesis'). In the didactic process, the objects of teaching and their organisation form a milieu. The mesogenesis describes the process by which the teacher and students organise or reorganise the milieu through the changing knowledge itself. The didactic process is characterised by

constantly evolving knowledge. Chronogenesis refers to the temporal advancement of knowledge in the didactic system. The didactic process involves actors whose positions are not equivalent. Topogenesis makes it possible to consider the distribution of epistemic responsibilities between teacher and students in didactic transactions. There is a close relationship between these three dynamics, which 'evolve together' in the didactic situation. The analysis of these geneses makes it possible to answer the question of who is supposed to participate and when and how in the construction of the knowledge of the work being studied. This has to do with the programme, its organisation, and the characteristic elements relating to the musical theme and the parameters of the sound (duration, pitch, intensity, timbre), basing the analysis mainly on the images evoked by the music through the contrasts of nuance, orchestration, and tempo. The analysis also enables the description and understanding of the place of each of the actors in the emergence and co-construction of the knowledge related to this work.

The second thesis analyses the creation of didactic memory in showing that it makes contents institutionally visible. How do teachers create a didactic memory when they teach mathematics in secondary school (Araya-Chacón, 2008)? Didactic memory is the collective memory of the knowledge that has been constructed and is common to the group; it is to a large degree controlled by the teacher in order to progress in the construction of new knowledge. Recall, the explicit evocation of a 'didactic memory', is a particularly important form of creation of didactic memory. It is the teacher who embodies the didactic memory and who asks students to explicitly call upon their memory of certain events of formerly mobilised knowledge in order to study a new problem, these events being part of the official memory of the class. Recall is an essential modality ensuring 'institutional visibility'. When knowledge is recalled, its institutional visibility is increased. The main form of didactic memory is ostensive memory, deliberately constructed by appropriate means by an institution or individual. In her thesis, Araya-Chacón distinguishes several types of gestures that ensure didactic memory and its management. Some are oriented towards the recall of technical contents and notions; others are intended to move students into previous positions in the course of the teaching sequence by allowing them to remember ways of doing something they already know; yet others have the function, in the course of the teaching sequence, of placing an object of knowledge on other levels and in other perspectives of what has been learned. Didactic memory plays an essential role in distinguishing between what is worth remembering and what can be forgotten, or simply ignored. In this respect, it fits in perfectly with Halbwachs' anthropological conception (quoted by Araya-Chacón), which consists in approaching the capacity for individual memorisation by reintegrating it into a collective point of view, here constructed in the classroom, itself manifesting the school institution's valuation of knowledge worthy of being memorised.

The third thesis studies the relationship of student to school knowledge, an essential dimension for teaching and learning. The circulation system of the

blood is quite commonly taught in primary school: how does the relationship of students towards knowledge, more particularly towards the knowledge of the 'vivid', influence teaching and how is it transformed by it (Pautal, 2012, 2015)? Every individual has a certain (dominant) relationship with knowledge (i.e. with the very question of knowing) and may have different relationships with different types of knowledge. This perspective is essential for didacticians whose preoccupations are centred on the transmission of disciplinary knowledge. Learning knowledge relating to the circulation system can, for instance, be strongly influenced by the relationship with knowledge of the lived experience of the students concerned. Can the way in which knowledge progresses as activities take place in the classroom (chronogenesis), the way in which the actors take hold of this knowledge in order to make it progress (topogenesis), the possible transformation of the environment of shared meaning (mesogenesis) be better understood by being observed and analysed from the angle of the relationship to knowledge? Applying such concepts to the analysis, the type of relationship that students have with the knowledge in life science, for instance to that relating in particular to the circulation system, makes it possible to explain how they seek to take over and exploit the didactic milieu according to their concerns, and in turn why the advancement of knowledge in the classroom progresses – or not.

Conclusion

The main aim of the present chapter was to elucidate the dichotomy between Didaktik and curriculum. Didactics as an academic discipline is indeed a continental European phenomenon; professorial chairs in the curriculum are, as Tröhler (2014) states, very rare. This probably has to do with the conjunction of many factors – including the status of teachers, teacher education, the governance of schools and their relationship to the state, the way *Lehrpläne* or 'plans d'études' are elaborated and validated, and many others. But the feature they have in common – namely that didactics is the main reference science (with educational sciences) in the professional part of teacher education in the whole of continental Europe – should not hide the fact that what is apparently the same name, 'Didaktik/didactique', does not designate the same reality. As I have shown, the origin, the *raison d'être*, the positioning of francophone disciplinary didactics is quite specific (and, by the way, besides many Latin countries in Europe, also influences Quebec and Latin America). It can be described as the result of a constant combat[12] against the lyric and romantic illusions that still dominate in curriculum reform. It has itself resulted in a critical attitude towards the notions of competence and individualistic approaches to teaching and learning and towards dominant poles in the educational discourse, including constructivist education, neoconservative elitism, and neoliberal control of output. The background of this orientation is the political origin of the pioneers of disciplinary didactics, and a general educational background that can probably be traced back to the concept of 'instruction' in Condorcet.

This does not at all lead to a homogenous school of thinking in francophone disciplinary didactics, to a united scientific community. On the contrary, different theoretical approaches are competing with each other, here as in any disciplinary field. But one can nonetheless distinguish some features that are common and characterise francophone didactics compared to others, in the sense that there is an attraction to ways of doing research, asking questions, using concepts that are oriented towards how the didactic system functions more than towards how it can be transformed. An original theoretical apparatus is under construction that transcends the single disciplinary didactics and makes possible the development of original empirical research guided by conceptual tools. Didactics as scientific research, as science, develops first of all as a multitude of didactics, from and around school disciplines. This construction of plural didactics, and also the fact that these are mainly based on teacher education and their institutions, calls, by their very movement and by the reflection that accompanies it, timidly, and with difficulty, in various forms for a more general science whose purpose is to analyse, describe, and understand the dissemination of knowledge in institutions specialised for this purpose: disciplinary didactics as an academic field. The constitution of this science requires, as does any science, a general reflection by each researcher on the generality of his conceptual and methodological tools. There is a need, in other words, for what could be called 'general (disciplinary) didactics'.[13]

Notes

1 An analysis of the bilingual special issues on didactics of the *Schweizerische Zeitschrift für Bildungswissenschaften/Revue suisse des sciences de l'éducation* [Swiss Journal of Educational Sciences] confirms these tendencies (see for instance no. 12, 1990; no. 13, 1991; no. 27, 2005; no. 38, 2016; see also the analysis of all papers on didactics between 2000 and 2020: Aeby Daghé and Schneuwly, in press).

2 Keiner and Schriewer (2000) show similar differences between educational sciences: 'sciences de l'éducation' on one side and 'Erziehungswissenschaft' on the other; more generally, Charle, Schriewer and Wagner (2004).

3 On the dialectic between the 'didactique', singular, as an academic field in construction and the construction of several 'didactiques' for different school subjects leading to a more or less unified scientific field, see Dorier, Leutenegger and Schneuwly (2013), where one can also find a general history of francophone 'didactiques disciplinaires'. A contradictory debate on this question is documented in Ligozat, Coquidé and Sensevy (2014).

4 'Knowledge' in the large sense of what Comenius termed *scire*, which includes, in his own words, 'Wissen' [knowledge] and 'Können' [knowhow] (1648/2005, p. 159).

5 Teaching and learning through teaching is, by the way, the double meaning of the ancient Greek word διδάσκειν [didáskein], which is the root of 'didactics'.

6 There are at least ten different francophone research associations in disciplinary didactics and about 15 journals; the first one in 'didactique des mathématiques' was founded in 1973, two others in 'didactique du français' about at the same time. Hundreds of books and theses were produced. Some syntheses exist, for example, for natural sciences (Astolfi and Develay, 2005), French (Simard et al., 2019), social and economic sciences (Legardez, 2001), and life and earth sciences (Orange-Ravachol, 2012).

7 In francophone countries, the concept 'curriculum' is almost absent, in the same way as Horlacher (2018) shows for German-speaking countries: 'plans d'études', the equivalent of *Lehrpläne*, define what has to be learned. 'Curriculume' is however quite widely used, since the 1980s, in the sociology of education (Mangez and Liénard, 2008).
8 The autobiographies of two important participants at the 'birth' of mathematics didactics (Mercier, 1999) and French first-language didactics (Bronckart, 2016) show this evolution from the point of view of actors.
9 One of the best critiques of the ideology of the OECD discourse in PISA is by two didacticians: Bart and Daunay (2016).
10 This is also true for Switzerland, for instance. It is noteworthy that in French-speaking Switzerland, the ministries in charge of schools – each of the 26 Swiss cantons has such a ministry – are called 'départements d'instruction publique,' whereas in the German-speaking Switzerland one finds 'Bildungsdepartement'.
11 This process of rebuilding and reconstruction, and even of building of school knowledge of its own, is theorised by the concept of 'scolarisation' (Denizot, 2013) of knowledge: the construction of a 'school culture' (Chervel, 1998) of its own. The relationship between didactic transposition and scolarisation is discussed in Denizot and Ronveaux (2019).
12 As one knows, Comenius himself, and Rathke before him, introduced the Latin word '*didactica*' in the combat for education for all.
13 A systematic comparison with the approach presented by Vollmer (in this volume) could show, in still another way, differences and commonalities between 'Didaktik' and 'didactique'.

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