
The Building of a New Academic Field: the case of French *didactiques*

MICHEL CAILLOT

Université René Descartes, Paris, France

ABSTRACT In this article, the author attempts to show how French disciplinary *didactiques* were created and have developed. At the beginning, nobody could forecast the future and whether the *didactiques* would one day be recognised by the academic and instructional systems. The French *didactiques* are strongly based on school subject matters. Since the creation of Instituts Universitaire de Formation des Maîtres (University Teacher Training Institutes) in 1991, they are completely integrated in French educational research and training systems: a major evolution in education that has taken about 40 years. More recently, a new field of research is developing in the French-speaking area: comparative didactics that groups together disciplinary didacticians in a true research programme.

Introduction

In this article, I will attempt to describe how a new field of research and practice in education was born and how it has developed in France: the case of *didactiques*. I would here keep the French term and not try to translate it. The aim of this special issue of *EERJ* is in fact to discuss different European traditions on teaching and learning: the Nordic, the English, the German and the French. All have specific idiomatic names (teaching and learning, *didactique*, *Didaktik* ...) and it is almost impossible to translate them because they never cover the same conceptual extension.

If I compare the French term *didactique* with the English one *didactics* in dictionaries, for example, many differences appear. *Didactics* is recognised as a noun in English whereas *didactique* usually is not in a French dictionary, although I will here use it as a noun. However, the corresponding adjectives have practically the same meaning: 'intended for teaching or instruction'; yet there is another meaning in English where didactic has a pejorative meaning: 'too much inclined to teach others; boring and pedantic or moralistic' (*Webster's New World Dictionary*). To translate or not to translate? That is the question. In this article, I am choosing not to translate, and to use *didactique(s)* with the French spelling to show that there is a real French specificity in education with the fields of *didactiques*. The plural is intentional because one *didactique* is related to one school subject matter. Here I will use the English terms 'didactic' or 'didactics' when they do not refer to the French *didactiques*.

The article involves four main parts: (i) the history of *didactiques*, their birth and development, (ii) their specificity in education, (iii) the description of some concepts forged in a particular *didactique* and now largely extended to other *didactiques*, and (iv) the recent evolution of the field with the creation of the new French teacher training centres and the development of comparative studies between the different *didactiques*.

1. A Short History

The field of what was going to become *didactiques* started around the mid-1960s after the extension of compulsory schooling to the age of 16 for every student in 1962. Previously, compulsory schooling stopped at 14. This came along with the creation of an integrated junior high school (the so-called *collège unique*) from grade 6 to grade 9. Although this *collège unique* was streamed, new

problems of teaching arose: (i) what curriculum? and (ii) how to teach it to 'new' students? To answer these questions, the Ministry of Education decided to create official commissions in order to produce new syllabuses and new materials. The first one was for the teaching of French. Should mainly abilities in oral and written language be taught or should one teach French literature and classical authors? The Ministry appointed a commission from 1964 to 1969, which made controversial propositions. But the main point for our purpose was that young academics in linguistics and psycholinguistics began to research and present linguistics concepts to French teachers in in-service training sessions. The academic research in French language as a first language expanded considerably. Then a partnership developed between researchers, teacher trainers and practitioners. The same scenarios took place for the *didactique des mathématiques* and the *didactique des sciences physiques*.

In 1966, the Ministry of Education appointed a commission to reform mathematics education. A famous mathematician named Lichnerowicz chaired it. Its objectives were to change the entire curriculum, from the first year of primary school to the final year of secondary school. Academic mathematicians declared that the current curriculum was obsolete and proposed that 'new' mathematics, more in phase with Bourbaki's [1] revolution, should be taught. It was the start of the movement of 'modern maths'. No primary or secondary teachers had been trained to teach this new mathematics. Then the Ministry of Education decided to create official in-service training centres in some universities. They were called Institut de Recherche sur l'enseignement des mathématiques (IREM), and the capital 'R' in IREM is important. One of the objectives of IREMs was to develop research in mathematics education. The other one was to make teachers familiar with the 'new' mathematics. The first three IREMs opened in 1969. A university professor chaired each of them and young academic mathematicians joined them as researchers and teacher trainers. Thus it was in the IREMs that the *didactique des mathématiques* was created and the term *didactique* was coined. A lot of research has been done in these institutes and many young mathematicians prepared and defended their PhD there. Yves Chevillard, who is also contributing to this *EERJ* issue, was one of these young mathematicians. A characteristic of this kind of research was the creation or the import of concepts such as didactic transposition or didactic contract that are now commonly used by didacticians of disciplines other than mathematics.

The situation in physical sciences was very similar. A commission was appointed in 1970 by the Ministry of Education to make curricular propositions to teach physics, chemistry and technology with a new approach for grade 8 through grade 12. Its chair was Lagarrigue, a famous nuclear physicist who gave his name to the commission. The approach of the 'Lagarrigue Commission' aimed to present physics and chemistry in a more unified way, based on some fundamental principles instead of teaching isolated units with no links between them, and to give some insights into recent discoveries in physics (e.g. nuclear physics) or chemistry (e.g. polymers). But there was one major difference with what was happening in mathematics education: no in-service training centre such as the IREM was planned and academic research was fostered through the creation of three labs in Paris. All of the three were chaired by professors of physics and affiliated with physics departments. Young assistant professors joined the three labs very quickly and prepared their PhDs in physics or chemistry education. The *didactique* of physics or the *didactique* of chemistry started at that time. Secondary physical science teachers were recruited and worked alongside academics.

In summary, to underline similarities between the births of the three examples of French *didactiques* discussed here, I would say that

- all three were born after curricular reform projects spearheaded by the Ministry of education;
- universities were involved and research was done in disciplinary departments such as the linguistics department, mathematics department or physics department. So research was the most important activity of the first didacticians, and not teacher training;
- education departments were never involved. One of the reasons is that at the end of the 1960s and beginning of the 1970s, the majority of educational researchers were inspired by a libertarian philosophy and ideology. For example, in 1971 Illich wanted to 'deschool' society (Illich, 1971). Very often, these educationalists denied any school content and they did not take school knowledge seriously. On the contrary, the new didacticians emphasised the content and its

specificity and based their research on specific subject matters. However, they had no background in education.

After these pioneer years, a movement towards a scientific quality was developing. As early as 1974, a first postgraduate programme in disciplinary *didactiques* was established at University Denis Diderot in Paris and PhDs were defended. The movement spread elsewhere than Paris in universities such as in Lyons and Grenoble where active centres of research were developed. Very early, the different didacticians felt the need to strengthen their community by publishing peer-reviewed journals. The journal *Recherches en didactique des mathématiques* first appeared in 1980 and science didacticians decided to publish the journal *Aster* in 1985 and *Didaskalia* later on. Each community organised regular seminars and meetings, and associations of specific didacticians were created in the 1990s. All this movement shows how diverse scientific communities have been created and have been developed. Each community is relatively small (e.g. around one hundred people in *didactique des sciences*), although active in spite of its small size!

2. Some Specificity of French *didactiques*

The most important specificity of any *didactique* is that a specific subject is always involved. We can say *didactique de X*, X being any subject taught in schools. After the pioneering *didactiques* (French, mathematics and physical sciences), other *didactiques* have appeared: the *didactique* of English as a second language and the *didactique* of biology around the mid 1970s, the *didactique* of physical education around 1980, and so on. Very recently, we have seen the beginning of the *didactique* of musical education. At the end of the 1980s, the French didactic scene was fairly split, even if one *didactique* can use concepts borrowed from another one. So we can say that one of the characteristics of any *didactique* is its strong emphasis on the content of a subject, not only the school content, but also the academic content and what is around it. Thus didacticians have interests in the epistemology and history of their disciplines, without forgetting the history of the school discipline (its roots, the history of curriculum and syllabus, and so on). A didactician should be a good connoisseur of his/her academic discipline of reference. For example, to do research in *didactique* of physics, it is better if you know physics well. In the heroic times, this was not a problem since the first didactician-researchers were young academics in the field. Now the situation has slightly changed since the new PhD students are, for the most part, teachers in primary or secondary schools. But the epistemological vigilance requires that the new PhD students' background be in the academic field of the considered *didactique*.

In the 1970s, the first didacticians were fairly reluctant to take educational studies into account and preferred to be affiliated to disciplinary departments; now the current ones are no longer so reluctant. The theoretical references for learning are often the same. If in the 1970s Piaget was inevitable, now Vygotsky and social constructivism are shared in educational and didactic studies. A big rapprochement has taken place in the last 20 years. The best proof is that disciplinary didacticians have been appointed as full or associated professors in several education departments and in the new teacher training institutes (see below). Some of them have even been heads of education departments.

Another aspect to be underlined is that the *didactiques* should not be confused with pedagogy or some 'general didactics'. I have insisted on the major place taken by content in didactic research. The work of disciplinary didacticians is to take subject matter into account with its specificities and to study how a small piece of knowledge can be taught for better student learning. Pedagogy, as it is considered in France, is often related to educational theories developed by philosophers such as Montaigne, Rousseau, Dewey, or by practitioners who have written about their innovative practices in classrooms (Freinet, Montessori, etc.) Other issues developed in pedagogy are the students' personalities, teacher-student relationships, classroom atmosphere, learning styles and so on. In all these topics and educational studies, subject matters are absent. We could say pedagogy is more speculative than *didactiques* are.

A question arises when we see the different disciplinary *didactiques*: would there exist a general didactics that would subsume these different *didactiques*? The French answer is 'No!' and I will later explain why and how we have dealt with this issue by an open discussion between the disciplinary didacticians.

3. Conceptualisation

Another characteristic of French *didactiques* is their concern with producing elements for a didactic theory respectful of each disciplinary specificity. As for any academic field, didactic research should not be solely empirical; it must also forge its own concepts to explain didactic situations and phenomena. If pedagogy builds all-encompassing theories that cannot be falsified, *didactiques* require that theoretical frameworks be tested. Mathematics didacticians have pushed theoretical concerns the farthest. They have introduced specific concepts whose presentation can be found in Johsua & Dupin (1993). These concepts such as 'didactic transposition' (Chevallard, 1991) or 'didactic contract' (Brousseau, 1986) are well known and have become very familiar to all didacticians whatever the disciplines. But didacticians coming from other disciplines have also forged concepts. Thus, in physics and chemistry didacticians have also generated concepts such as (i) the concept of 'conception', which is very close to mental representation of a phenomenon, or (ii) the one of 'obstacle-objective' (Martinand, 1986) where the difficulty of learning of a piece of knowledge is an obstacle to further learning and where the teacher's objective is for his/her students to overcome the obstacle.

Didacticians did not 'create' all the concepts they use. Some of them are borrowed from other fields. I myself have borrowed the concept of 'relationship to knowledge' from Charlot (1997), who has been a prominent researcher in French educational studies for a long time. This concept enables me to interpret how a student is involved in his/her own learning of such or such a piece of knowledge.

4. The Current Situation

Since the early 1970s, the situation has really evolved. The most important change happened when new teacher training institutes, the so-called Instituts Universitaire de Formation des Maîtres (IUFMs; University Teacher Training Institutes), were created in 1990-91. Previously the influence of didactic research had almost no impact on teacher training: no influence on pre-service teacher training and a low influence on in-service training. However, some teacher trainers were associated with researchers or even got a PhD in disciplinary *didactique*, and could participate in-service training. But they were too few to have any influence on the system of training. Beyond the academic research, the issue of the social utility of such research could be raised with some good reasons. For the work done by didacticians this was rather negative!

When the IUFMs were created, the official texts regulating their creation were explicit on the important role of *didactiques* in teacher training. Several didacticians were appointed as academics for a teacher training based on didactics. In fact the place of *didactiques* has been unstable in the teacher training curriculum. First, all teacher trainers were not really familiar with the *didactiques*. Secondly, the problem – not yet solved – was what to do with the results of research? How to relate them to classroom practice? In some institutes, lectures in *didactique* of X were given without any link with the practice of trainees. This was largely counterproductive. In other cases, trainers used didactic concepts to analyse class situations, building up a strong base for teacher training. The *didactiques* also appear in trainees' personal works. Every trainee must write a professional dissertation and its evaluation will be used to certificate him/her as a professional teacher. The careful examination of the content of these dissertations shows that some (not all!) trainees use didactic concepts to analyse class situations with which they have been confronted. We can say that the results of didactic research have a pervasive trend to be included in teacher training, but may be not so much as some had expected.

Beside the role of *didactiques* in teacher training, new trends in research have appeared since the mid-1990s. The split didactic scene of the 1980s where each *didactique* had few relationships with other *didactiques* has changed in the 1990s. French-speaking didacticians (mainly from France and Quebec) from different disciplines thought that ignorance of what was done by the others was counterproductive and thus they decided to confront their research and their points of view. They organised several meetings to discuss similarities and differences between the concepts they used and their methods: Liege (Belgium) in 1991, Sherbrooke (Quebec) in 1992, Louvain-la-Neuve (Belgium) in 1994 and finally in 1998 Toulouse (France). These meetings led to books in which different contributors discussed the meaning of didactics (Jonnaert & Lenoir, 1993) and made a

thorough study of three major concepts used by didacticians whatever their discipline: didactic transposition, didactic contract, and mediation (Raisky & Caillot, 1996). The most recent meeting held in Toulouse grouped together French didacticians to raise the question of what reference for the *didactiques*, in other words, the question of the relationship between school knowledge and scientific knowledge (Terrisse, 2001), even if one of the contributors (Caillot, 2001) raised the question: to which student do *didactiques* refer? Only an epistemic student or a more holistic one?

In 2002, Mercier et al edited a special issue of the most influential French journal in education – the *Revue Française de Pédagogie* (2002) – whose title was ‘Towards a Comparative Didactics’.

The active movement of confronting ideas has led, in 2004, to the creation of a new French-speaking association, the Association pour les Recherches Comparatistes en Didactique (ARCD; Association for Comparative Research in Didactics). Its aim is to group together disciplinary didacticians, whatever their discipline, to compare the concepts and the methods they use. Another goal is to confront the research of disciplinary *didactiques* with social sciences such as anthropology and sociology (e.g. curricular sociology). I can say that a true research programme (with Lakatos meaning) is born. What does doing comparisons in didactics mean? It is out of the question to go towards too general affirmations that would give body to a ‘general didactics’ where the results of research in each disciplinary *didactique* would disappear. On the contrary, the comparative studies in didactics try to think about what is generic or specific to some extent in the functioning of didactic systems. Comparative didactics is based on the studies of classroom situations where the processes of teaching and learning are such as they are, in other words with a real and ecological validity. In the first annual meetings of ARCD, there were workshops where the attendants worked on the same corpus of data (often transcripts of class situations) to see how each didactician, whatever his or her discipline, would have analysed such a corpus. The conclusions were that the teacher’s actions can never be understood independently of the specific knowledge to be taught and of the teacher’s project. Each action includes some generality and some specificity at the same time. In fact it is located on a continuum: generality–specificity. Comparative didactics would like to be able to model the interactions between the teacher and the students during the processes of teaching–learning. Thus it would be the pursuit, through a fruitful exchange between the disciplinary *didactiques*, of what they have already studied.

Conclusion

In this article, I have attempted to show how French disciplinary *didactiques* were created and have developed. At the beginning, nobody could forecast the future and whether the *didactiques* would one day be recognised by the academic and instructional systems. Now they are completely integrated in French educational research and training systems – a major evolution in education that has taken about 40 years! Moreover, a new field of research is developing: comparative didactics that groups together disciplinary didacticians in a true research programme where theoretical confrontations and comparisons between class practices and didactic contexts are the core of a common objective of this programme.

Notes

- [1] Bourbaki is the collective name under which a group of twentieth-century French mathematicians wrote a series of books presenting an exposition of modern advanced mathematics, beginning in 1935. Their goal was founding mathematics on set theory.

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MICHEL CAILLOT is Professor Emeritus of University René Descartes, Paris, France. His interests are in science education. He was the EERA President from 2002 to 2005. *Correspondence:* Michel Caillot, Education et Apprentissages, Université René, Descartes, Paris V, 45 rue des Saints-Pères, F-75006 Paris, France (caillot@paris5.sorbonne.fr).