

ISSUES IN INTEGRATIVE STUDIES
No. 28, pp. 170-207 (2010)

IN SEARCH OF INTERDISCIPLINARITY IN SCHOOLS IN FRANCE: From Curriculum to Practice

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Abstract: Interdisciplinary processes are being developed for a better present and future in primary and secondary education teaching in France. Over the past few years, the education authorities have increased incentives to open the subjects for one another and created new teaching-learning programs for interdisciplinary purposes. In spite of the obvious determination from the *Ministère*, the results of research on daily practices, as well as most of the official reports, show that the teachers of primary and secondary schools experience real challenges in implementing truly interdisciplinary teaching-learning activities.

Key words: Primary education, secondary education, school subjects, versatility, teaching practices.

Introduction

In this article, we will study what interdisciplinarity is in schools in France, both in primary and secondary education. We will aim at describing and explaining the recent evolutions and current trends of updated interdisciplinary practices. Actually, in convergence with evolutions observed in many countries, the French educational system is gearing its efforts towards a way for pupils to acquire skills and traditional school knowledge at the same time. The *Socle commun de savoirs et de compétences* (national learning standards) (*République française*, 2006), which is the basic learn-

ing that all pupils should have acquired at the end of compulsory schooling, focuses on breaking down the barriers between subjects, which must help them acquire the school knowledge useful in social life. This evolution, strongly impacted today by international evaluations (PISA), comes along with the necessity for pupils to acquire transdisciplinary skills, which should be present in the school curricula as well as in the definition of the trained teachers' profiles.

First, we will introduce the recent evolutions in the two levels—primary and secondary—of the French education structure, in which we will present the grounding models and practices. Secondly, we will present the results of surveys and studies on the teachers' interdisciplinary practices.

Our contribution relies on works that have been pursued for more than 12 years now by a study group¹ that has published numerous articles, as well as on studies conducted from a didactical perspective on the practices of secondary education teachers.

1. Evolution of the Concept of Interdisciplinarity

1.1 *The French Educational System*

As of today, there are more than 12 million pupils enrolled in the French educational system, from nursery school that accommodates children age 2 and up, to secondary schools for 10- to 18-year-old pupils. Education is compulsory for children between ages 6 and 16. Higher secondary education is divided between general and technical high schools and professional high schools, until the final graduation for both channels, *le baccalauréat*.

The French educational system is 84% public and remains very centralized: primary schools (for pupils age 2 to 10), junior high schools (pupils age 11 to 15), and high schools (pupils age 16 to 18), are under the authority of the *recteur*, the regional commissioner of education who supervises all of the school district services. The *recteurs* answer to the *ministre de l'Éducation nationale* (Secretary of Education). Curricula are established in the *ministère de l'Éducation nationale* (Department of Education) in Paris and are applied nationwide. The system is grounded on two theories, inherited from the primary and secondary orders (Prost, 1968), which have structured the French school since the 19th century. Primary education, which was organized during the 19th century, always focused on teaching

¹ *Le GRPPE, Groupe de recherche sur les pratiques professionnelles enseignantes* (Study Group on Professional Teaching Practices).

the fundamentals (Furet & Ozouf, 1977), at a time when that education was geared almost exclusively towards the working class children. Their needs were thought to be only utilitarian and mostly involved knowing how to write and count. Other subjects, very progressively and quite incidentally, were to be added to the curricula during the 19th and 20th centuries. As for secondary education, it mostly targeted upper-class children, giving greater importance to academic subjects that developed at the same time as they did in primary school (19th century). Subjects are fundamental in high school, as proven by the official recruiting system of high school teachers that rewards people with a high level specialized college training so they can teach their specialty to secondary education pupils. In secondary education, new teaching subjects—hence new teachers—have appeared, mostly because of social demand, such as Social and Economical Sciences in 1966.

The unification process of the educational system, started in the 1960s, could have questioned this two-level system. Actually, at that time, all children and teenagers started being enrolled in primary, junior high, and high schools based on their age regardless of their social origin. The unification took place mostly at the secondary level and is reflected in the integration of pupils age 11 to 15 in schools offering a high school education.

The secondary education logic has definitely been decisive in influencing the whole school system, including primary education, which remains permeated by subjects as shown by some studies (Baillat & Niclot, 2000) on the professional identity of primary school teachers.

1.2 Evolution of the Concept of Interdisciplinarity

Works on the various aspects of interdisciplinarity are numerous, just in French only, and have been discussed for several decades (Lenoir & Sauvé, 1998). Even if we do not want to explore the prolific professional literature on the topic, nor detail the numerous French references from this research movement (Audigier, 1999; Develay, 1993; Fourez, 1997; Giordan, 1992; Lenoir & Sauvé, 1998; Morin, 1977, 1980, 1982, 1986, 1991, 1994, 1999; Rumelhard & Desbeaux-Salvat, 2000; Troger, 2001; Valade, 1999), we can still underline that it has been the concern of many, researchers and decision-makers alike, for a long time. We must recall the conference “Towards a New School,” held in Amiens March 15-17, 1968, under the leadership of the *Association d'étude pour l'expansion de la recherche scientifique* (Association of Study for the Expansion of Scientific

Research) that 700 participants attended, where researchers and activists were side by side with the top civil servants. That conference, whose general aim was to find solutions to the need for adapting the French school to modern society, gave a large space to interdisciplinary concerns and widely criticized the partitioning of knowledge. As one scholar said, “we keep dividing knowledge in purely formal and artificial slices, which is the negation of culture, and prevents from understanding the modern world” (Tricart, 1968, p. 7).

But we cannot avoid mentioning the considerable part played by Edgar Morin in reflecting on the theory as well as popularizing the concept of interdisciplinarity. We must refer to the four volumes of *The Method* published between 1977 and 1991, as well as *Science with Conscience* (Morin, 1982) and *Link Up Knowledge: A Challenge for the 21st Century* (Morin, 1999). Without denying the importance of subjects, Morin wrote “subjects are absolutely justified from an intellectual point of view as long as they keep in mind that there are links and solidarities between them” (1990, p. 5), the sociologist calls for a change in their status, including inside the school: “school subjects should intertwine the categories of knowledge instead of partitioning them” (Morin, 1998, p. 5). “A subject must be open and closed at the same time” and “to think beyond the subject is necessary to the subject so that it does not become automatic and finally sterile...” (Morin, 1990, p. 6).

The many works of Yves Lenoir must also be mentioned because of their major influence in France for the past 10 years. He especially created the concept of conceptual structuring in 1991, and in 1998 applied it to interdisciplinarity in school. Nevertheless, we need to remark that in France these studies were mostly conducted in colleges and high schools, hardly in primary schools, as if the matter were less important at that level.

What is most striking is that even though researchers have been studying the topic, and public action decision-makers have been interested in it for a long time, the daily school reality has not really been affected. It looks as if the wishes to develop interdisciplinarity clashed with forms of resistance strong enough to prevent it from effectively permeating teaching practices.

Works from Vincent (1996) and Troger (1999) repeatedly criticized the partitioning of knowledge: This critique, though, began at the Amiens conference in 1968, but also appeared in the Bourdieu-Gros report (1989) or in the statements of the *Conseil National des Programmes* (National Council on Curricula). Troger (1999) especially insisted on the weight

of the disciplinary lobbies, which consider homothetic relations between high school and college subjects, and thus end up making school a sanctuary for subjects. Eventually, the sociologist is led to ask the question of the fundamental link between subjects and the “school format” (Vincent, 1994). This link first explains the resistant attitude within schools to interdisciplinary attempts, and secondly transforms all favorable intents of interdisciplinary practice into “appropriate rhetoric” (Troger, 1999, p. 5), which, notwithstanding the experts’ sincerity, mostly plays into a more political game.

How does this “rhetoric” translate in the school curricula? Because of the very structure of the French school system, we will distinguish the case of primary school teachers from that of secondary school teachers.

1.3 Interdisciplinarity in the Primary Education Curricula

Most of primary education curricula are structured around subjects, leaving almost no space to interdisciplinary projects. Three documents testify to this and give explanations: the 1995 official curricula, the 2002a ones,² and finally the 2005 text entitled *Socle commun des savoirs et compétences* (national learning standards or common base of knowledge and skills) (Ministère de l’Éducation nationale, de l’Enseignement supérieur et de la Recherche, 2006).

In the 1995 curricula (*Ministère de l’Éducation nationale*), “the essential learning consistency” (p. 39) has not been forgotten, referring to the advantageous position of the versatile teacher who “favors the implementation of processes using several subjects to build or consolidate a type of learning. It creates the conditions to set up, through the various subjects, the intellectual processes that lead to autonomy and can be learnt in all of the class activities, while being at the service of the various disciplinary contents” (*Ministère de l’Éducation nationale*, p. 39).

The wording of the curricula remains based on the subjects though, from the cycle of fundamental learning (the first two years of elementary school, for pupils aged 6 and 7) to the cycle of deeper learning (the next three years, for pupils aged 8 to 10). The first cycle actually refers to: French, mathematics, world discovery, civic education, artistic education, sports and physical education. The cycle of deeper learning refers to French, mathematics, science and technology, history and geography, civic education, artistic education, sports and physical education.

² They were amended in 2008.

The novelty in the 1995 curricula in the cycle of fundamental learning appears mainly in a new subject entitled “world discovery,” which is presented as an interdisciplinary process including space and diversity of landscapes, time in the life of humans, the world of matters and objects, and the living world. Many teachers perceived world discovery as a new presentation of the traditional subjects (geography, history, physics and technology, biology), but it was a true attempt at blending topics. In fact though, this attempt was not formalized by the didactic tools offered to the teachers (Baillat, Espinoza & Niclot, 1999). The world discovery textbooks still keep a structure based on the original subjects, thus suggesting traditionally founded practices.

The 2002 curricula (*Ministère de l’Éducation nationale*, 2002a) for the cycle of fundamental learning keep the same display as in the 1995 ones, but introduce a distinction between disciplinary “domains” and “fields” for the cycle of deeper learning. The four domains encompass the disciplinary fields more familiar to teachers as shown in the following table:

Table 1
Teaching Domains, as Defined by the 2002 Guidelines

Domains	Disciplinary Fields
French language, human and literary education (12h)	<ul style="list-style-type: none"> • Literature (4h30 to 5h30) • Observation and analysis of French language (grammar, conjugation, spelling, vocabulary) (1h30 to 2h) • Foreign or regional language (1h30 to 2h) • History and geography (3h to 3h30) • Collective life (guided debate) (0h30)
Scientific education (8h)	<ul style="list-style-type: none"> • Mathematics (5h to 5h30) • Experimental science and technology (2h30 to 3h)
Artistic education (3h)	<ul style="list-style-type: none"> • Musical education (1h30) • Visual arts (1h30)
Sports and physical education (3h)	<ul style="list-style-type: none"> • Sports (1h30) • Physical education (1h30)

Neither the text of the curriculum nor its commentary make any reference to interdisciplinarity. Especially in the cycle of deeper learning, subjects structure the curricula, with the open intent, in the background, to pre-

pare for higher education: “in cycle 3 (deeper learning), pupils are getting ready to follow the teaching of the various subjects in junior high schools” (Ministère de l’Éducation nationale, 2002c, p. 26).

The 2005 decision to establish a *Socle commun des savoirs et compétences* (national learning standards or common base of knowledge and skills) aims at founding “the purposes to define what any pupil should know at the end of compulsory education and what is essential, according to the law, to successfully achieve [the pupil’s] education, to carry on its training, to build its personal and professional future, and to succeed in its social life” (République française, 2006, p. 4). The five sections³ of the *Socle* do pursue a will to integrate subjects, as does the notion of skills. However, “even though many skills hold a general character and are common to several subjects, they must be learned through the acquisition of specific knowledge, and this text is thus presenting them in each of the five sections of the *Socle commun*” (République française, 2006, p. 26). In reality, the display of the five sections in as many constitutive elements as traditional subjects well reflects the power of the models of school subjects. Actually, with the exception of the last paragraph that deals with mastering common techniques of information and communication, there is no reference made to any interdisciplinary concern.

We cannot attribute this quite permanent lack of concern from the academic authorities to their ignorance of what is at stake in this process. In its recent report on “Teacher Training in Science Teaching”⁴ (November 2007), the *Académie des Sciences* (academy of science) recalled the need for primary school teacher training, “to avoid the disciplinary fragmentation in science teaching, in the spirit of the *Socle commun*, to break down the science isolation by utilizing the versatility of primary school teachers, by permanently connecting science with the teaching in French, foreign language, and history and geography” (Académie des Sciences, 2007, p. 9). The same report also insists that “even more than the initial training, it is in continuing education that interdisciplinarity should be emphasized” (Académie des Sciences, p. 17).

³ Mastering the French language, mastering the main elements of mathematics, attaining a humanistic and scientific culture allowing the free exercise of citizenship, practicing at least one foreign language, mastering common techniques of information and communication.

⁴ Made on the occasion of the integration of IUFM (University Institute of Teacher Training) into the University.

The advice though was not quite heard by the curricula’s authors.⁵ Some reports from the *inspection générale de l’Éducation nationale* (IGEN, National Superintendence) do not conceal their skepticism towards interdisciplinary processes, which, of course, does not help in placing them in the curricula. But most of all, it is the high school education model that influences the whole school education and thus dissuades any kind of interest in interdisciplinarity. The subjects’ partition, which is characteristic of high school education, constitutes a reference impacting primary education. Actually, “primary education curricula conforming to the lines of secondary education ones makes the professional activities of school teachers more demanding in the epistemological and didactical mastering of the knowledge” (Prairat & Retornaz, 2002, p. 593). Also the same curricula are being defined by the organization of high school education, which comes after them and now enrolls all pupils, and thus becomes the real objective of all teaching. In this context, primary education, which is the preparatory phase to a 10-year-course (in theory)⁶ seems to be well absorbed into the disciplinary dynamic.

1.4 Interdisciplinary Perspectives in French Secondary Education

If secondary education is firmly grounded in disciplinary logics and strongly influences the organization of primary education for which it remains a kind of model, it has nevertheless undergone some reforms aiming at breaking down the partition of school subjects. From 1999 on, new programs have been set up to aim at developing new interdisciplinary teaching-learning situations in the French secondary education. They have been organized outside of the traditional framework of school subjects and centered on pupils’ projects. Government guidelines gave a precise description of their hours, goals, pedagogical and didactical methods and sometimes defined the themes to be explored. Meanwhile, the disciplinary curricula of junior high and high schools have been opened to collaboration between subjects.

It is difficult to establish a synthetic photograph of the space given to interdisciplinary processes in the French secondary education, since it keeps changing. Interdisciplinary teaching keeps transforming, whether in its title, content or hours. It must be said too that many personalized aid actions towards the pupils have been developed in junior high and high schools,

⁵ For most of them, the *inspection générale* (National Superintendence).

⁶ Most pupils carry on studying beyond the age limit of compulsory education.

and that it is sometimes difficult to decipher them from the processes specifically geared towards crossing subjects. So, in order to identify the interdisciplinary teaching, we will use the meaning given by Nicole Allieu-Mary (1998) to the concept of interdisciplinarity: “a generic term to name the relations established between the school subjects in a general fashion” (p. 2). The author considers that interdisciplinarity needs “interaction between two or several subjects, from communicating ideas to integrating concepts, methods or vocabulary” (Allieu-Mary, p. 15). And to complement it, we will also lean on the definition given by Françoise Cros (1995) for whom interdisciplinarity is a process of “mutual fertilizing of several subjects” (p. 587).

In order to make an inventory of interdisciplinarity in French secondary education, we can analyze the government guidelines currently setting up the teaching in junior high and high schools, whether general, technological or professional. With the definitions of interdisciplinarity presented above in mind, we will first identify and describe the programs set up to develop interactions between school subjects. Then we will analyze the subjects’ curricula, since they present more and more incentives to develop common activities with other subjects.

1.4.1 Teaching-learning programs with interdisciplinary goals. When we analyze the curricula applied in 2007-2008, we can identify five teaching-learning programs that aim at interlinking subjects. They are presented in the table on the following page together with their corresponding grade level and the years they were started.

Table 2
Interdisciplinary Programs of Secondary Education in France in 2007-2008

Name of Program	Type of School	Grade Level	Hours	Year it Started
Discovery Itineraries (DI) (Itinéraires de découverte)	Junior high school	7th & 8th	2 hrs/week	2002
Class with Artistic and Cultural Projects (ACP Class) (Classe à projet artistique et culturel)	Junior high school	6th to 9th	Not specified	2001
Guided Personal Projects (GPP) (Travaux personnels encadrés)	General high school	11th	2 hrs/week	2000, amended in 2005
Civics, Legal and Social Education (CLSE) (Education civique, juridique et sociale)	General and professional high school	10th to 12th	1 or 2 hrs/week	1999
Multidisciplinary Professional Projects (MPP) (Projets pluridisciplinaires à caractère professionnel)	Professional high school	12th BEP 11th & 12th	100 to 125 hrs/year 150 to 180 hrs/year	2001

— **Discovery Itineraries (DI)**

In September 2000 “cross-works” were created in junior high schools. In 2002, they became “Discovery Itineraries” (*ministère de l’Éducation nationale*, 2002b). The transformation was prepared by the report on the evolution of junior high school written by Philippe Joutard in 2001. He proposed to create rounds of discovery grouping several subjects “linked together around a federating subject that deals with the curriculum in a different manner. They require from the pupil an autonomous work individually and with a team, partly in document research with the usage of information and communication technology. They are concluded by a production to be assessed” (Joutard, 2001, p. 27). The text further reads “comparatively with the cross-works, the Itineraries are not outside but in the core of teaching since they are related to the curricula and allow the pupil to build up his [sic] skills and knowledge in a different manner” (Joutard, p. 28).

The ideas developed by this report gave birth to the Discovery Itineraries. The term “itinerary” has been preferred to that of “round” by the authorities. The sessions are led by willing teachers already in position in the school. The government guidelines insist on the need to create links with the existing curricula. In this perspective, and following the recommendations made by the Joutard report, the government guidelines defined four themes: nature and the human body; arts and humanities; language and civilization; creation and techniques (*Ministère de l’Éducation nationale*, 2002c).

— **Classes with an Artistic and Cultural Project (ACP classes)**

Classes with an Artistic and Cultural Project, otherwise known as ACP classes, have been presented to all sixth grade students since 2001. The guided activities are linked to disciplinary teaching: literature and poetry, writing, visual and practical arts. Within the framework of these teachings, links must be created between several subjects (French, plastic arts, history/geography, science, ...). The great originality of this program comes from its teaching by teachers together with outside contributors (visual artists, writers, filmmakers, ...), which definitely proves a will to open the school to the outside world.

— **Civic, Legal and Social Education (CLSE)**

Civic, legal and social education (CLSE) was started in 1999 in each of the three classes (10th, 11th and 12th grades) that compose the course of high school, both general and professional. It takes about two hours a month and the themes tackled are defined by government guidelines (*Ministère de l’Éducation nationale*, 1999a, 2000b).

In 10th grade: from social life to citizenship.

In 11th grade: the governmental system and how to exercise citizenship.

In 12th grade: citizenship in a changing world.

The teaching focuses on the pupils acquiring the necessary knowledge and practice to become free, responsible and autonomous citizens with a critical mind. It is organized in an open debate in class. Beforehand, students have to work out a document with the help of their teachers. This leads to student involvement in activities of research, writing, contradictory speech, and minutes or report writing.

— **Guided Personal Projects (GPP)**

The Guided Personal Projects were extended to the 11th and 12th grades in 2002 after a trial run in the 1999-2000 academic year (*Ministère de l’Éducation nationale*, 2002b). They required two hours a week per pupil. The pupils work in groups of two to four and choose a topic from a nationally established list. Two teachers from different subjects lead the sessions. They build up a problematic and define the framework of the topic that must intertwine at least two subjects. The final production can take different shapes: model, poetry, debate, written paper, scientific experiment, video, Internet page. ... The topics are defined nationally by the *ministère de l’Éducation nationale*. The *Ministère* decided to cancel the GPP in the 12th grade in 2006. They remain compulsory only in 11th grade. Since 2007, their assessment has been taken into account for the anticipated graduation tests.

— **Multidisciplinary Professional Projects (MPP)**

The Multidisciplinary Professional Projects (MPP) is a program specific to professional high schools, set up by an official publication in the *Bulletin Officiel de l’Éducation Nationale* (*Ministère de l’Éducation nationale*, 2000). They consist of a complete or partial achievement of a material production directly related to the professional domain studied by the pupils for their diploma. A general subject teacher and a professional subject teacher supervise them. In industrial training, the students’ final production is generally a technical production (for instance, a vehicle being rehabilitated, the making of a model ...). In service training, the production has more of a social dimension (creation of a fraternity, help to the organization of a sports event ...) or an economic dimension (assistance in a fashion show, creation of a commercial flyer or promotion material ...).

In the government guidelines, all these programs herewith briefly de-

scribed are presented as “new” since most of them were implemented between 1999 and 2001 (Ministère de l’Éducation nationale, 1999b, 2001). Thus they are different from the disciplinary teaching in the school tradition. In spite of being very diverse, these new teaching programs share a number of traits. First, building a personal project is at the core of the pupils’ activities. The government guidelines actually insist on the students becoming autonomous and having individual approaches. As Larcher and Crindal (2006) remark, the “titles of these programs (DI, GPP, MPP) all imply notions of personal work, path, course, project, multidisciplinary, profession” (p. 5). Then, even though the actual term of interdisciplinarity is never mentioned in the framing governmental guidelines, the crossing and multiplication of disciplinary approaches to achieve the project is the main goal of all these programs, whatever their title or the grade to which they apply. The government guidelines systematically insist on the need to develop activities connected with the disciplinary curricula. Finally, several programs (GPP, MPP) include contributions from outside professionals. The APC classes do require the collaboration of a teacher and an outside contributor. Even in the programs in which the teachers are by themselves (CLSE, DI), the teachers’ work is different from what they perform in their disciplinary teaching. They are not “knowledge dispensers” anymore, and their legitimacy does not come from their mastering a subject anymore. They have become mediators who help the students achieve their projects.

Yves Lenoir (1991) identifies three means by which to develop interdisciplinary approaches: through objects, by building up skills, and by learning processes. He then introduces 10 types of operating links between subjects. In his classification, he differentiates the importance of the links (pseudo-interdisciplinarity, supplementary and subsidiary interdisciplinarity), and also their timeframes (limited, occasional, general/widespread, systematic). Starting with this typology, we can determine that the authorities gave a common goal to all the programs: implementing a systematic and widespread interdisciplinarity by the study of an object, in close link with the curricula.

1.4.2 Opening up the disciplinary curricula. At the same time that these new teaching-learning programs were created, the disciplinary curricula underwent drastic transformations. Although they remained self-reliant and isolated, we can notice that the current ones are breaking down the tradition and include more and more incentives to collaborate with other subjects. In order to show the changes, we will compare and analyze the curricula of three school subjects (French, history and geography, health and biology) as

an example. We will first study the 1990 curricula, then the 2006 ones, for junior high and general high schools.

In the history-geography curricula in effect in 1990, the only references made to sources outside the specific disciplinary knowledge or methods are for the pupil to do some research work at the *Centre de documentation et d’information*⁷ and for the teacher to use literary texts. As for the French curricula of that same year, the references are similar to the ones in history-geography. However, we can find 14 incentives to interdisciplinarity in the health and biology curricula in 1990. They are also more numerous in the high school curriculum (9) than in the junior high school one (5).

In the 2008 curricula, there are widespread mentions of interdisciplinarity in all studied subjects (Ministère de l’Éducation nationale, 2008b; 2008c). Moreover, they are more numerous; from K-12th grade 84 mentions have been noticed in the health and biology curricula, 56 in history-geography, and 40 in French.

If we observe more closely the disciplinary links, we notice that some are more recurrent than others. Thus, for all grades, history-geography is asked to connect with French 13 times. French is required to collaborate with history-geography 15 times. As for health and biology, they are urged to collaborate with physics and technology 42 times. The links between the two subjects are particularly noticeable in 11th grade (French major) where their curricula are blended.

The guidelines also commend less expected disciplinary links, between literary and scientific subjects, for instance. Thus we can find many incentives to create links between health and biology and French (11 times), or between history and health and biology (5 and 8 times, respectively), or between French and visual arts. In order to really favor the links, the guidelines about health and biology quote in detail excerpts from the curriculum of the subject with which the link is to be made. Such an approach is exceptional and cannot be found in the other subjects’ curricula.

The links to create between the subjects have various goals. The first one is to contribute to a better understanding of a main topic for one subject. In the case of French, it is to better study the language, the human body in health and biology, and the patrimonial texts in history-geography. The second is to develop transversal competencies. Mastering the language is the first targeted skill: It is mentioned 9 times in the history-geography curricula, 15 times in the French ones, and 18 times in the health and biology ones. Aside from mastering the language, three other transversal domains

⁷ School library, present in all schools.

are referred to several times in the curricula: education to citizenship, health and environment. Consequently, the recent subject curricula do offer numerous contacts with each other. It must be remarked, though, that the offered crossings are always one to one.

1.4.3 Why interdisciplinary perspectives are developing. Among the principles defined by the introductory text to the 1996 new curricula (*Ministère de l'Éducation nationale*, 1996), the will to “get the subjects closer to one another to offer consistent learning to the pupils” (p. 3) comes first. The pupils are said to need intellectual tools and to interlink the school subjects to question and understand the world they live in. To reach this goal, the guidelines explore three ways:

- studying topics common to several subjects on which pupils are given several approaches and points of view;
- teaching with officially recommended methodologies that are common to several subjects;
- implementing common activities by teachers of several subjects.

The evolution of the disciplinary curricula as well as the creation of new programs such as Civic, Legal and Social Education (CLSE), Guided Personal Projects (GPP) Multidisciplinary Professional Projects (MPP), and Classes with an Artistic and Cultural Project (ACP classes) from 1999 on reveal an actual implementation of the general principles verbalized several years before. The increase in numbers of the interdisciplinary teaching-learning programs based on project building and the opening of the disciplinary curricula to collaborating with other subjects correspond to the need to adapt the educational system to French society's evolution and especially to secondary education going global. The number of secondary education pupils started increasing in the 1960s, and the 1977 reform certainly boosted the movement with creating the *collège unique* (one-for-all junior high school) that took in all French pupils until age 16. The huge increase in numbers of junior high school pupils made the high school numbers go up four year later, in 1981. The massive influx⁸ led the public school to become

⁸ For information and in order to really understand the extent of it, there were 15,000 *baccalauréat* candidates (high school graduation) in 1930, in 1960, there were 81,000 and almost 415,500 in 2008 (the last figure only refers to general high schools, not the professional ones) according to the figures from the *Direction de l'évaluation de la prospective et de la performance*, 2008 (Department of Education, Service of Prospective and Performance Assessment).

much more heterogeneous than before, when the pupils came mostly from privileged classes that knew what was at stake with the school subjects and knowledge.

Thus interlinking various disciplinary approaches seemed to be the solution, together with individualized aid programs chosen by the authorities, to give back its consistency to primary and secondary education. The authorities gave to interdisciplinary perspectives the essential function to make the pupils generally understand the use of school learning and the specificity of the subjects in particular. The recommended interdisciplinarity in junior high and high schools is intended to reinforce the existing subjects, and not to replace them nor to set them aside. “The secondary education traditional organization, in most Western countries, relies on a partition of school time in disciplinary time. This time and cognitive partition comes from the recognition by the scholarly culture of ‘large bodies of knowledge’ built by the scientific communities. (...) The differentiation of knowledge thus existed before the school was organized and defined its partition” (Maingain, Dufour & Fourez, 2002, p. 17). Faced with the school subjects as constructions, we need to put them in perspective. Thanks to the development of interdisciplinary approaches “the pupils do not see the disciplinary construction as reality anymore but as a vision of reality, a filter through which reality is presented” (Bonnichon & Martina, 1998, p. 53).

Therefore, we realize that the pupils' learning in French secondary education is organized around a double-sided logic: school subjects open on one another; and the interlinking of the subjects. However, whether they rely on objects, methods, or activities, the interdisciplinary links recommended by the government guidelines never really challenged the disciplinary logics. On the contrary, they tend to underscore the importance of each subject and to make their specificity more easily understandable by the pupils. So what the official guidelines recommend seems to be interdisciplinarity “with” and “by” the school subjects. They offer connections, but no reconstruction nor breaking up of the established subjects. Thus the official guidelines try to reinforce the space given to subjects and their logics in secondary education, trying to erase their most negative consequences such as those deriving from the teaching partition. Nevertheless, the intended interdisciplinarity, which is more and more present in secondary education curricula, is hard for teachers to implement because it potentially entails a number of changes in the teaching methods and contents, as well as in the pupils' activities.

2 Current Interdisciplinary Practices in Education in France

2.1 *Interdisciplinary Practices and Pupils' Learning in Primary Education*

Surveys on primary teachers' interdisciplinary practices are quite uncommon in France. Some works do refer to the practices (Morlaix, 2000), but they do not permit a well-grounded observation of the practice based on the texts. Such a sentence as “the time allotted to the various types of learning in primary school, and specifically in *CM2* (5th grade), contributes to develop transversal skills that are common to various activities, aside from the specific knowledge to each subject” (Morlaix, p. 124) is foremost a hypothesis that would need empirical confirmation.

In the same trend, Deviterne et al. (1999) want to include interdisciplinarity in a promising theoretical program. Their definition of versatility as a concept includes much of multidisciplinary: “in its most common meaning, versatility is the didactical and professional mastering of all the subjects,” and interdisciplinarity “versatility can mean the mastering of the connections to establish between subjects,” up to transdisciplinarity: “versatility can also be conceived as the capacity to offer contents, tasks and activities building up the pupil's transversal competencies” (Deviterne et al., p. 92). But here again, the promises say nothing of what is actually happening in the classroom.

When the studies do include empirical data, conclusions remain quite pessimistic on the state of practice: “most of the time, or rather, with the examples that were given to us and the data we gathered, the lessons, whether of history, geography or civic education, are not really linked to anything else than themselves. Although very often wished for, the links between subjects are very few” (Audigier, 1999, p. 54).

Actually, the reports from *l'inspection générale de l'Éducation nationale* (the National Superintendence) are quite reliable sources of information on interdisciplinary practices in the classroom. These reports do talk about the teachers' practices but raise an issue about how their data were gathered. Most of the time, observations are made by inspectors during their visit to a class in order to assess teachers. Their observations, that have no research purpose, can then be biased by the context. With this reservation, the reports nevertheless constitute an important reference. Two of them appeared to us as being very interesting on interdisciplinarity⁹ in primary education.

⁹ We can also mention Bonhoure (2008), Bouysse, Moirin, Maestracci, & Saint-Marc (2007), and Bonhoure & Hagnerelle (2003).

The first one, entitled “School teaching, a job of the future,” was presented to the *ministre de l'Éducation nationale* (secretary of education) in February 2002 by Yves Bottin. After he evoked the importance given by the teachers to the passing on of knowledge, he remarked, “in their conception of their role, two thirds of the school teachers give more importance to the passing of knowledge, one third give the priority to their educating role” (Bottin, 2002, p. 9). The report assessed that nowadays teachers spend more time teaching history, geography, science, etc., than in the 1950s. But “we should wonder why there is such respect of formalism, that very often has more to do with a vision of a job conscientiously done than in a search for efficiency. The pupils' results, when they are bad, can therefore be seen by the teachers as an outside [failure], due to social issues, background cultural and educational deficiency, etc.” (Bottin, p. 21).

Most of all, “the efforts of the observed teachers focus on building up rituals and school habits for the pupils in order to guarantee that each child is set up to work; priority is often given to set up adequate postures in all pupils, especially the ones in difficulty. The shaping, done over and over, seems to occupy teachers more than the knowledge contents. Also, aside from French and mathematics, in most cases, the teachers seem to give more emphasis to practical tasks than to conceptualizing the disciplinary subjects” (Bottin, 2002). In these conditions, we understand better that interdisciplinarity is an obvious obstacle: “the three main difficulties encountered by teachers are to teach some subjects, to create a team work, to establish links between subjects” (Bottin, p. 25).

The second report, presented to the *Ministre* in October 2005 (IGEN, 2005) is specifically about experimental and technological science, history and geography. As soon as page 7, the report takes a clear stand on interdisciplinarity:

[I]nterdisciplinarity conceived as a general “federative” theme to be applied to each subject (water in physics, poetry, and visual arts) was quite in fashion some time ago, and has now almost disappeared from the studied teachers' notebooks. The few observed cases (for example, focusing a good share of the school year in all subjects on one high profile sports event followed on the Internet) show the little pertinence of the method that tends to erase the consistency of the teaching mentioned in the curricula, to give importance to trivia and end up scattered. (IGEN, p. 7)

The report is very critical throughout, and especially in the section “suggestions for leading a class” (IGEN, pp. 17-18) in which three are emphasized: leaning on the official guidelines, focusing on the founding concepts

of each subject, and being directive. It is quite striking that no reference to interdisciplinarity, nor to links between subjects, is made.

The position of the second report is quite interesting for several reasons. First, just like in Bottin's, they clearly remark the absence of interdisciplinary practices. Secondly, the posture of the authorities supervising primary education is obviously skeptical as to interdisciplinary practices, not to say unfavorable to their development. This is something to remember when investigating the practices more closely in a scientific framework.

Thanks to two studies led by the GRPPE (Baillat, 2003, 2008), a scientific study group, many elements about interdisciplinary practices in primary schools were brought out, together with the relationship of the teachers with them (Baillat, 2003, 2008). The two studies take into account an essential element of the teachers' professional identity, and their versatility, which structures at the same time their work position and their identity.

In the first study on 183 primary school teachers, they almost unanimously expressed that versatility allowed "building bridges between subjects." However, when the researchers asked for a justification, then there was no more consensus but four types of answers:

- 39% just agreed without any justification;
- 21% included at least one reason to support the idea, and have nothing against it;
- 27% answered without justifying and added at least one toned-down argument or mentioned restrictive conditions ("yes, with the condition that ...");
- 7% gave at least one favorable argument and one toned-down argument or mentioned restrictive conditions.¹⁰

At the end, if the expression "to build bridges" was generously supported, the large proportion of "yes" with no other comment testified that it was difficult to justify an opinion otherwise massively shared. Also, the recurrence of toned-down arguments proved the difficulty of implementation.

Now what are the favorable arguments for building bridges between subjects? Even though they vary in nature, they can be gathered in a few large categories. First, there is the concept of "global pedagogy": for some teachers the subject partition is artificial for reality is a whole. It is necessary to show the global unity to the pupil by the practice of interdisciplinarity. The second category would be that of meaning and motivation: building bridges

¹⁰ 7% did not answer the question.

between subjects permits giving the pupils meaning and motivation for what they learn. The third category deals with the child's entirety. A few teachers talk about the knowledge entirety in reference to the child's entirety, since s/he does not operate in partitions. In the last category there are only a few teachers; they consider that building bridges only makes the subjects serve the fundamental learning of mathematics and French. Some people think by establishing links between school subjects it becomes possible to study a concept from various points of view.

Some fewer teachers still express reservations that can be grouped together around the following themes: the practices aiming at building bridges between subjects would be judicious only with the younger pupils (preschool/ kindergarten); they could be leading to going in circles, and not dealing with the disciplinary concepts; for some, there is even a doubt as to the possible existence of bridges between the various kinds of knowledge, only definable in strictly disciplinary terms. The main argument in favor of "bridges" is about a generic pedagogy. But the negative arguments testify to the difficulties, the reluctance, and the doubts on the possibilities of building such bridges. Finally, the general impression that comes out is that teachers are convinced that it is useful to build bridges, but experience difficulties implementing it.

Do the offered bridges reflect what is being done in class? When teachers are being asked to give examples of links they make between subjects, some do not answer and some give light indications such as an arrow between two subjects, which is not easy to interpret. Nevertheless, if we group the examples of bridges into categories, it shows that for 34% of the teachers, a fundamental subject (math or French) serves as a tool to another; for 20% of them, using one subject is only an excuse to learn other things; 8% are thinking of working on a common concept ...¹¹

The examples reveal that the teachers have very diverse conceptions of bridges they can make between subjects. For some, it can be a simple juxtaposition; the "tool" and "excuse" categories are truly about interdisciplinarity but with a hierarchy included. As for the "theme" category, it is more about the multidisciplinary of the studied subjects than a real interdisciplinary approach.

In a very logical way, teachers who do answer to the question on interdisciplinary practices (7% do not) all agree that versatility allows them to "build bridges between subjects." But behind this apparent agreement, qualified opinions can actually be found. Above all, only 21% of the teachers fully adopted the interdisciplinary pedagogy and supported it by at least one

¹¹ For detailed results, see Baillat (2003, 2008).

positive argument. The others qualified their opinion, mentioning how difficult it is to build bridges, how the all-inclusive pedagogies are limited and some even doubt the possibility that bridges exist.

When teachers are asked to give examples of bridges they make between subjects, they reveal how difficult it is to implement interdisciplinarity. Many do not answer the question (13%), or say that they juxtapose two subjects (21%). Examples given by others show greatly varied conceptions: “tool” (34%) and “excuse” (20%) show that they see a hierarchy between the school subjects, which was also noticed by Yves Lenoir (Lenoir, Larose, Grenon & Hasni, 2000).

Examples of teaching with themes show that people confuse interdisciplinarity and multidisciplinary. The former is an approach aiming at “linking two or three school subjects (...) in order to create complementary or cooperative relationships between them, or to generate interpenetration or reciprocal actions on several aspects (objects of study, concepts and notions, teaching processes, technical skills, etc.), so that the pupils better take knowledge and learning processes in” (Lenoir, 1995, p. 46). The latter, which is used in thematic teaching and consists in successively studying French, plastic arts, history and other examples of the same subject, which can be multidisciplinary, does not allow any real integration of subject matters and knowledge, since the only existing link is the studied subject that is outside of them.

Examples from the “common concept” and “common activity” category, which are closer to the interdisciplinary definition given by Lenoir, are few and little varied. Inevitably, they lead to asking the question of whether one concept can really be shared by several subjects. For instance, do the surveyor, the visual artist, the sportsman, and the geographer all talk about the same “space”? The results confirm one of the conclusions made by Lenoir (1997) on the need to think of interdisciplinarity in school from top to bottom: only if the course is organized around interdisciplinarity, then interdisciplinary didactics and pedagogy will emerge. Interdisciplinarity cannot be invented by the teachers; that is what the answers to our survey prove. This being said, we can thus measure how difficult it is to implement this program, especially when it is not believed in by the decision-makers.

The second survey from which we drew our empirical results aimed to observe and classify the classroom practices as they appeared to the surveyor, but also as they were supported and commented upon by their creators.¹² Fourteen teachers were surveyed, agreeing to be filmed while teaching their

¹² The applied method is called “self-confrontation interviews” where the practitioners comment on their actions after watching a video-recorded capture of what they did in class (Goigoux, 2002).

class, and above all, agreeing to participate in the self-confrontation interviews led by the researchers. Classes were in history, geography, science, etc. We analyzed four classes in history and geography and came to a first conclusion that the time spent on establishing explicit links with other subjects was extremely limited for each of them, respectively 2:21, 0:51, 1:17, and 2:22 out of a 5:5 class (Philipot, 2004).

It is generally thought that knowledge integration (Lenoir & Sauvé, 1998) requires that the teacher explains the process and adopts “a posture that is epistemological, critical and thought-out of one who thinks and sets up action” (p. 126). The time allotted to building “bridges between subject matters” certainly does not make this process development possible, which is confirmed by the study of the lessons’ content.

In the four lessons of history or geography, the forms of interdisciplinarity appeared consequently limited and mostly instrumental, which serves as an excuse to get to learning in another subject. During the interviews, or in the preparatory papers, when the teachers agreed to show them, there was no indicator that those links had been anticipated. Only the didactic situation, i.e., the difficulties encountered by the pupils to understand a fact/an idea or by the teacher to make a fact/an idea understood, or the skills needed to do an activity (for instance, to make a calculation or to read a text), might bring the teacher to establish a link with another subject. It is mostly with French or math in the case of history and geography. In some cases, collective oral interactions can lead the teacher and pupils to drift away from history and geography to move to another subject. The four teachers practice a *de facto* “opportunistic interdisciplinarity”; when they teach history or geography in grades 1-5, they adopt the disciplinary logic and fall totally into the disciplinary model, at least in its formal characteristics. Interdisciplinarity, and not to mention integration, cannot be considered to be at the core of their practice.

In a more general way, our results show that interdisciplinary perspectives, which some think to be “natural” in versatile teachers, are not quite being implemented in the daily practices, whether in grades 1-2 or 3-5. When there are references made to other subjects (analyses show that 5 out of 14 observed teaching classes make no reference to another subject), the bridges made are limited to verbal allusions from the teacher, or are made through recalling previously studied notions or skills that are useful to achieve one goal or to answer one question. The analysis of the lessons confirms that the teachers mostly practice a “utilitarian” “tool-like” interdisciplinarity on occasions when appropriate, which can be adjusted to the variety of learning-teaching situations they conduct.

The teachers, in the studied lessons, make systematic reference to the traditional subjects (history, science, mathematics, etc.) but do not refer to the larger domains of the curriculum. The teachers adopt the disciplinary models by having the pupils do traditional disciplinary exercises (writing a commentary on historical documents in history, solving a problem in mathematics, conducting an experiment in science, playing percussion in musical education, working on maps in geography, etc.).

We can wonder what are the consequences of systematically inserting the lessons into one disciplinary model that is often limited to its most formal aspects, without really mastering the didactics or having a reasoning and critical approach to the said disciplinary models. Would this professional posture be the reason why most primary school teachers cannot implement the integration of school subjects recommended by the curricula? And yet for most teachers interdisciplinarity is the core of their professional identity. If that is the case, then we can draw two conclusions out of these surveys. One is that the widely spread belief that the very logic of the work position (versatility) of the primary school teacher would be enough to generate interdisciplinary practices is not quite supported by what is observed in the classroom. A critical look at it should enable one to contemplate other models for the organization of the teaching work in school. The second conclusion is that interdisciplinary work does not come intrinsically from the work position, but comes out of deliberate processes that should first appear in teachers' education (Sachot & Lenoir, 2004).

2.2 Interdisciplinary Practices and Pupils' Learning in Secondary Education

If the official guidelines aim at creating good conditions for interdisciplinarity to emerge and develop in secondary education, then the teachers' practices should keep up with what the curricula recommend. Considering that most junior high and high school teachers are expert in teaching one or two specific subjects for which they received college training and for which they were recruited, we can then wonder how they can conceive and implement interdisciplinarity in their classes.

In order to try to answer this question, we will study three main sources. The first one is the results from a survey on interdisciplinary practices and lessons observations led by researchers from *IUFM Champagne Ardenne*. The second is supplied by the study of reports made by the authorities on the implementation of interdisciplinary processes. The third one is a research

report on the Guided Personal Projects (GPP), the Discovery Itineraries (DI), and the Multidisciplinary Professional Projects (MPP), led by a work group from *Institut national de recherche pédagogique* (National Institute for Pedagogical Research).

First, we will study how secondary education teachers view interdisciplinarity through their answers to a survey. Then, we will study cases in order to better understand how teachers interpret and implement the official guidelines. The cases include disciplinary lessons with an interdisciplinary dimension taught in junior high and high schools, and some practical examples studied within the new programs previously described.

2.2.1 Interdisciplinary practices as reported by the teachers and pupils' learning. We conducted a survey on the representations of interdisciplinarity and the practices among secondary education teachers who were training to become Pedagogical Advisor at the *IUFM de Champagne Ardenne*. They were asked to answer 17 questions: 13 closed, four open. Sixty-one teachers participated; they were all expert teachers. The surveyed teachers presented two noticeable traits: 60.7% were women, 68.9% taught in junior high schools.

Table 3
Details of Implementation of Interdisciplinary Practices

Name of Program	Number of Teachers
Outside of any specific program	6
DI	20
GPP	11
APC Class	5
DI and GPP	1
GPP and APC class	1
DI and APC Class	1
Total	45

We can notice that more than half (45 out of 61) started interdisciplinary processes within the two academic years before the survey; 15 did not, and one did not answer. The interdisciplinary situations reported by the teachers were very diverse, but the DI and GPP were the most frequent. Six teachers reported interdisciplinary teaching outside of the specific programs, most likely during their disciplinary teaching. Out of the 40 teachers who imple-

mented interdisciplinary teaching within the specific programs, 15 also did it during their disciplinary teaching. Adding the 15 to 6 who only practiced interdisciplinarity during their disciplinary teaching made almost a third of our panel who had interdisciplinary practices outside of the specific programs. This was actually not very much compared with what the curricula recommended about interdisciplinary practices developing from the disciplinary teaching.

Some grades seem to be more appropriate to receive interdisciplinary activities than others. Actually, when asked “in which grades did you conduct interdisciplinary teaching?” the teachers answered in seventh and eighth grades in junior high schools (36 out of 85) and in 11th grade in high school (12 out of 85). This is not really surprising since the programs set up by the authorities to favor the development of interdisciplinary practice were designed for eighth grade (DI) and 11th grade (GPP).

The teachers consider that interdisciplinary practices really affect the pupils’ learning. Actually, the 45 teachers who reported conducting interdisciplinary action think that their pupils learned something special. The things reported learned are varied; we can decipher three main categories: disciplinary learning; transversal competencies; and pupils’ relationship to knowledge.

“Knowledge” is the most used term (14 times) by the teachers in their answers. They also often mention the know-how specific to a subject, such as drawing a map in geography. The term “research” comes in second position (13 times) in all the teachers’ answers; this term is often associated with “to do,” “pupils,” and “documentary.” There are also other expressions that refer to transversal competencies such as reading documents, elaborating a problematic. In what the teachers say, interdisciplinary practices influence greatly the methodological learning. The expression “autonomy of the pupil” is also found 5 times. One teacher mentions “the development of a critical mind.”

The great majority of the surveyed teachers talk about the relationship of the pupils to the school subjects, which is known to have a great impact on the mechanisms of success or failure in school (Charlot et al., 1992). However, once the answers are closely analyzed, we can divide the teachers in two groups. For most of them, interdisciplinarity does not question the established school subjects but reinforces them since it allows them to better understand their meanings. In the two following excerpts, the teachers insist on the fact that interdisciplinarity allows the pupils to better understand the logics specific to each subject, and to create links between them: “The pupils

essentially understood that learning from each teaching makes a whole”; “The pupils realize that links can be established beyond the disciplinary teaching.” The teachers also notice that the pupils are more motivated within those teaching processes. “Interdisciplinarity makes it more enriching for both pupil and teacher. With it, we can motivate the pupils by offering them a new framework for the acquisition of skills and knowledge (attraction to novelty),” reports one surveyed teacher. A minority of teachers have more reservations: “I think that the main goal should be to consolidate the fundamentals, and not to multiply activities which in the long run might penalize the weaker pupils,” says one of them. Another explains that interdisciplinarity “might confuse the pupils if they already have difficulties in our subject matter.” Also mentioned are “how it makes learning artificial,” “a new trend,” and “pedagogical dogma.”

The above-mentioned results have to be qualified since they are only about very few teachers seeking to become Pedagogical Advisors. However, they show a real divide between the teachers. A majority of them seem to be convinced that interdisciplinary practices should be developed for the benefit of the pupils since they allow them to consolidate what they learn in the subjects. These teachers are in accord with the official guidelines. A minority do not commit—or commit little—to interdisciplinary practices. They see their development as a danger to the future of their own subject and to weaker pupils for interdisciplinarity would divert them from learning the fundamentals. So it seems that implementing interdisciplinary processes has more to do with a personal choice and strong opinions than with applying the curricula recommendations.

2.2.2 Actual practice: Interdisciplinarity within disciplinary teaching.

To observe interdisciplinary practice conducted within disciplinary teaching, we analyzed five sessions done in junior high or high schools. We selected the classes by contacting secondary teachers who were known to be familiar with interdisciplinary practices. Five of them agreed to be observed while teaching a class in which they said they implemented cross-subjects teaching-learning situations. The sessions were recorded on video and followed by an interview with the teacher on his/her didactic choices. The observations aim at exposing the characteristics of the actual interdisciplinary practices and to understand what the teachers actually do when they say they practice interdisciplinarity.

Table 4 on the following page shows the characteristics of the five observed and analyzed sessions.

Table 4

List of Surveyed Disciplinary Classes with Interdisciplinary Practice

Teacher's Disciplinary Specialty	Associated Subject	Grade	Session Theme
French	Health and biology	6th	Various types of writing: explicative text/spiders
French	Health and biology	8th	Explicative text/volcanoes
French	History	8th	Argumentation: Emile Zola and the Dreyfus affair
History-geography	Economic and social science	8th	Social and economic upheaval in Russia since 1991
Health and biology	French	11th	Methodology of introduction

We can remark that four out of five lessons were in junior high school, and three were conducted by French teachers. Four sessions focused on acquiring transversal competencies (argumentation, types of writing, explicative text, methodology of introduction). In all cases, the teaching situations involved two subject matters.

The teachers create a link with another subject matter in order to deal with main topics in their own subject matter, whether they have the pupils identify the different types of writing in French in junior high school, or study the current economical evolution of Russia in history-geography, or Zola's works in French. In that respect, their methods conform to the curricula's recommendations, as noted before. Through their interdisciplinary lessons, the teachers also greatly aim at teaching transversal competencies to their pupils. For instance, one of the French teachers explained in her post-teaching interview that she taught her pupils how to identify the common layout of an explicative text so that they can better read and understand that kind of text in other subject matters.

The conception of a subject opening on other ones is not necessarily common to all teachers. Another French teacher who also studied the characteristics of the explicative text drawing from health and biology textbooks explained her choice by her desire to make the pupils capable of writing an explicative text, an exercise specific to French. She did not mention any extension to another subject. In the same vein, when the history-geography

teacher planned to have her pupils write a travelogue based on a planned trip to Russia, including information on the Russian economic evolution, she made no link with French. The general language-mastering skills that the pupils could have learned doing this project, especially with this kind of writing, have not been mentioned.

What should also be noted is that the surveyed teachers often seem to ignore the logics, methods, and epistemology of the subject matter they are crossing with their own. The French teacher who used documents on volcanoes to explore the characteristics of explicative writing only included lexicon and technical vocabulary from the health and biology areas to her lesson and ignored the investigative scientific approach that is so typical of that matter's teaching. The large space given by the French teacher to events and chronology during his lesson on the Dreyfus affair, in order to contextualize Zola's text, shows how obsolete his conception of history teaching was, since he favored factual knowledge and events listing. It seems that the surveyed teachers leaned on their own memories as pupils and considered that the subject they associate with their own is being taught the same way it was taught when they were pupils.

While being interviewed, the teachers revealed that they seemed to know little about the other subjects' curricula. Only one of the surveyed French teachers proved she could identify links between the history curriculum and her own. The lack of knowledge can be related with the paucity of dialogue between teachers of different subject matters. When it happens, it is usually in the form of informal talk about themes of the other subject's curriculum.

During the interviews, the teachers never referred to the government guidelines asking them to develop interdisciplinary practices. In most cases, the teachers know little of the subject they associated with theirs, nor its curriculum, methods, or concepts, and they barely communicate with their colleagues; consequently, they tend to apply a kind of interdisciplinarity that only serves the conceptual and methodological teaching of their own subject matter. The associated subject serves as a tool to confirm and facilitate the disciplinary teaching.

Whereas the official guidelines urge the teachers to open their subjects to one another, the observed lessons present a more closed-minded conception of interdisciplinarity. In Lenoir's words, this is "pseudo-interdisciplinarity" since, behind appearances, the associated subject shrinks down to mere anecdotes. This is far from being an integrative process to blend knowledge, which would be the most advanced form of interdisciplinarity, since the var-

ious disciplinary approaches would be made consistent so that the pupils can use concepts and methods coming from several subjects in order to question and understand reality. We can also conclude that even though some subjects are inter-related around one theme, the teacher remains the transmitter of a disciplinary knowledge, which corresponds to the centripetal vision of interdisciplinarity laid out by Cros (1995).

2.2.3 Practices in the new programs, as assessed by official reports. The previous analyses led us to notice that subject crossing within disciplinary lessons leads to a weaker form of interdisciplinarity. But what is going on in the programs specifically geared towards the development of interdisciplinary perspectives? To analyze the teachers' practice in the new programs, we are going to look closely at official reports and at a collective study led by the *Institut national de recherche pédagogique* (National Institute for Pedagogical Research).

The reports made under the supervision of the *ministère de l'Éducation nationale* (department of education) cannot be considered as study works, as mentioned before, about primary education. Their function is to evaluate the teachers' practice in regards to the goals set by the government guidelines. The reports on CLSE (Baconnet, Bancal & Fort, 2000), GPP (Baconnet, Bottin & Fort, 2002), and MPP (Aublin, Leroy & Thierry, 2001) were made one year after the new programs were applied nationwide. The report entitled "Programs on Artistic and Cultural Action (workshops and APC class) in Junior High School" (Régnier, 2006) checked up on the situation after five years of this program existing. This is also the larger one since it was conducted nationwide in 379 junior high schools, with the participation of 342 teachers, 264 outside contributors, 333 school principals, and 634 pupils. The four reports all converge on a few common issues in the practice implemented by teachers.

One common feature to all the programs is underscored by all reports: The programs offer stimulating activities to the pupils, since they divert from traditional teaching forms. Whatever the program, the pupils enjoy working differently and interacting in a more casual way with the teachers. According to Régnier (2006), "a really vast majority of pupils say they find pleasure, show creativity," and "felt more active during the activities" (p. 3). The same kind of conclusion emerges from the report on GPP: "the pupils appreciate to escape the usual pace of the school timetable. They find it gratifying to have to sometimes leave the school and be responsible for their transfers" (Baconnet, Bottin & Fort, 2002, p. 5). Even though the

pupils like the new programs, they diverge when asked what they learned through them. "The pupils view the programs in varied ways and do not perceive their long term benefit. Some even criticize the utility of certain time-consuming projects, through which nothing is learned. On the opposite, some feel absolutely committed, saying they learned and matured a lot" (Aublin, Leroy & Thierry, 2001, p. 10). As for the teachers, they view the sessions led during the programs as enriching, as much on the personal as on the professional side. They stress the "human" benefit of working with another teacher or an outside contributor. They also mention they get to know the pupils better and to learn more about the subject they associate with through their co-worker.

Yet, the conditions of truly interdisciplinary teaching situations remain sparse, and this is also common to all reports. For example, Baconnet, Bottin & Fort (2002) write about the GPP: "there are still very few situations where two teachers of different subjects work together, each with his [sic] own methodology, on a same subject. What usually happens is that they juxtapose the two subjects, instead of really linking them, and one normally takes over the other" (p. 5). As for the MPP, the same remark applies: "they did not permit to generalize the teachers' reflection on references, common or specific skills that the MPP should help acquire. The MPP has too often been conceived more as a project to achieve or activities to perform, than as one to acquire skills" (Aublin, Leroy & Thierry, 2001, p. 6). The study conducted in ACP classes led to similar conclusions. Only 8.4% of surveyed teachers reported that the ACP classes allowed bringing about "knowledge in the arts" and less than 6% aim at "showing how subjects can complement each other." However, 20.2% of the teachers stated that the programs give an opportunity to "work differently," and 12.2% considered that they "open the school onto the world." As for CLSE, the report read: "co-disciplinarity remained sparse aside from a few interesting projects. There were very few relationships between CLSE and the school life, if any" (Baconnet, Bancal & Fort, 2000, p. 17).

The reports recurrently say that the school context impacts the choice of themes and activities chosen for these programs. As Aublin, Leroy & Thierry (2001) explain about the MPP "the choice has not been based on exclusively pedagogical grounds, with a goal of training, aiding the pupils or deepening teaching: equipment's availability, a customer's request, or the will to respond to official instructions also played a main role" (p. 9). The impact of the context largely explains why the sessions'

organization and content are so diverse. The report on GPP uses the term “ill-assorted situations” (Aublin, Leroy & Thierry, p. 11). The one on MPP states: “the projects are led in very diverse ways in high schools. For example, there can be one only project for all the school classes, or several projects, either successively or simultaneously led in one class, for a small group of pupils. The timeframes are also very different: some run over two years (with the obvious risk of boring the students, if not the teachers), but some can run over three weeks” (Aublin, Leroy & Thierry, p. 14).

Reading the official reports on CLSE, GPP, ACP classes, and MPP, we realize that teachers do not center their thoughts and practices on the goal given by the government guidelines, which is to develop interdisciplinarity to give more meaning to subjects. A majority of teachers give more importance to creating new class situations different from the traditional disciplinary teaching, and making pupils active. It seems that the projects give the opportunity to get rid of the tensions rising from the daily teaching situations. They seem to become a space of freedom in which the pleasure of developing more casual relationships with the students and the opportunity to work with another teacher are essential, even if no common reflection has occurred beforehand. The implementation of interdisciplinary processes, which is the main reason for the existence of these programs, is an absolutely secondary goal for many teachers.

2.2.4 Practice in the new programs as assessed by research. The results of a collaborative study coordinated by Larcher & Crindal (2006) offer a slightly different view of the teachers’ practice since its problematic relies on a double-sided look at interdisciplinary processes. It actually studies how “knowledge is structured” by the pupils during the sessions of GPP, DI, and MPP, linking it with the new postures in which the teachers and pupils are engaged.

The main interest of the study is to show, from class analysis, that the new interdisciplinary teaching deeply changes how its participants view the school, the pupils’ activities, and the grounds of the teaching profession. “To get involved in those programs to do something different in a different way while making a priority of the pupils learning and improving their knowledge of the world certainly needs to modify one’s point of view on what is learned in school, to elaborate new skills, and sometimes to deconstruct and rebuild one’s own professional identity while mastering new postures suitable to a new role: this applies to teachers as well as to pupils,” write the

study’s authors (Larcher & Crindal, p. 4). The researchers stress the new role of teachers, which is “to conduct this process as is, whereas their professional identity leads them to help the pupils move forward in a pre-established disciplinary frame. For the teachers, this means changing their points of view, their identity, their postures, their gestures” (Larcher & Crindal, p. 6). They also show the characteristics of the activities of pupils who enter “a process of localizing, judging, selecting, consolidating, linking, articulating and structuring” (Larcher & Crindal).

The teams who observed the sessions have identified, for instance, several kinds of postures adopted by the teachers and the pupils. We can refer to two examples. One group of researchers working on MPP distinguished among five teachers’ (or professional contributors’) postures: “expert, leader, explaining, assessing, reader” and five pupils’ postures: “expert, actor, collaborator, performer, beginner” (Larcher & Crindal, p. 13). As for GPP, the description is quite similar: “accompanying, adviser, leader, listener,” and the pupils taking the postures of: “beginner, actor, performer, explaining.” Researchers also detail, by analyzing the sessions, the nature of the interactions between the pupils, teachers, and project. They aim at “building the subject, building up the process, achieving the practical and organizational aspects of the teacher’s intervention: encouraging, suggesting, imposing, reassuring, questioning, assessing, reformulating” (Larcher & Crindal, p. 13).

The study shows how difficult it is for teachers to accept a change of posture, for some feel deprived of their role and escape in strictly organizational interventions. But the study also analyzes sessions that interlink school subjects in order to comprehend the world and thus build up true interdisciplinary teaching. Researchers consider that, in spite of difficulties, in these new programs “the problematic of how knowledge is structured can help renewing postures associated to roles, and diversifying how knowledge is viewed.”

So we can expect programs that put interdisciplinarity forward through a project building process to generate fundamental changes in the work and activities of teachers and pupils alike. They could be the driving force that would change the school, relationships in the classroom, and allow pupils to better understand the meaning of what they learn in school. But the change of posture can happen only if, in the words used by the study, the teachers “fully commit themselves to occupy the space that is open to them,” which is far from being the case according to the results of this study and the official reports.

Conclusion

The development of interdisciplinary processes, even though the term is not explicitly present in the government guidelines, appears to be a major element of the present and future of primary and secondary education in France. Reforms in primary and secondary education have come one after another since the beginning of the 2000s and tend to set up new modes or new programs of teaching that break with the traditional organization of school subjects. Authorities clearly explain what they intend to do with them: The pupils need to better understand the meaning of what they learn in school, to remove the partition of school subjects that are self-enclosed and for which many pupils do not understand what they bring to them on a social, personal, or intellectual level. Teaching by competencies, widespread in the past few years in primary and secondary education, goes along the same lines, since several subjects help acquiring each competency defined by the guidelines.

Despite the authorities' obvious will, the results of studies conducted on daily practices, as well as the official reports, show that primary and secondary education teachers have trouble implementing cross-subject teaching-learning activities. In primary education, the versatile teachers remain most of the time in a "timely" or "occasional" interdisciplinarity, which is not really planned for and may remain elusive; that will not help build interdisciplinary learning processes in pupils. In the secondary education disciplinary lessons, there is mostly a practice of "excuse" interdisciplinarity where one subject is used to serve the pupils learning another. In the new programs geared towards the development of interdisciplinary processes, interlinking subjects is not what occupies the teachers most. They favor making the pupils active and autonomous, and center their pedagogical project on the opportunity to work differently, in a more flexible and friendly way with a group of pupils.

The difficulties encountered by many teachers in building a network of subjects in a project building process, or integrating knowledge in the study of a social object, which is encouraged by the authorities, can be explained by many reasons that have actually to do with the foundation of the teachers' professional identity. The importance of school subjects, which are the core of the post-graduate studies, but also of the professional training of the primary and secondary education teachers, since those still weigh a lot in the recruiting process of teachers, represents the main element in building the teachers' professional identity. Before being an expert at teaching pu-

pils, teachers are first an expert in knowledge and know-how allowing them to master one or two school subjects. As was seen before, the model is not only valid in secondary education. Even though a high priority is given to subjects, that is not the only element that would explain the obstacles to interdisciplinary practice. Thanks to a historical approach (Tardif & Lessard, 1999) it is possible to identify the structuring elements that constrain the teaching activity in frameworks that are not conducive to interdisciplinarity, such as "the cellular structure of school work" (Tardif & Lessard, p. 57).

On another level, some studies showed great discrepancies among teachers as to how they view teamwork and how they relate to the project idea.

The question of the pupils' knowledge and skills at the end of secondary education in order to become active and responsible citizens in the 21st century knowledge society is at the core of the French school evolution. And, in order to achieve this, there is a need for interdisciplinary skills. That is why it is important that teachers see in interdisciplinarity a way for their practice to evolve, that can be managed alongside the subjects, leaning on them, instead of seeing it as a threat to their grounded professional identity. Together with this acknowledgment will come the success of the reforms that will accompany the changes in the teaching profession required by today's changing school.

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