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INTERDISCIPLINARITY IN QUEBEC SCHOOLS: 40 Years of Problematic Implementation¹

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Abstract: This article presents a portrait of interdisciplinarity in the Quebec school system. Following a contextual overview of this system, including its sociohistorical evolution and current organization in order to define the problem of interdisciplinarity, a second section, beginning with a clarification of terms related to interdisciplinarity, explores the evolution of the concept over the course of the six curricula that have succeeded one another since the beginning of the 20th century, before describing the place of interdisciplinarity in this system. The third section presents the results of research conducted since 1985 on the discourse of primary school teachers concerning interdisciplinarity and its implementation in the classroom. Teacher conceptions and practices related to interdisciplinarity, as well as the place and function they ascribe to it, are dealt with in the next section. Finally, section four presents the results of a recent study on interdisciplinarity at the secondary school level. In the conclusion, we highlight, among other things, the central place given by teachers to socialization, as well as their limited consideration for teaching disciplinary knowledge.

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Introduction

The question of interdisciplinarity in the Quebec educational system has been one of the principal issues in the province over the past 40 or so years. Both staunch advocates and fervent opponents of interdisciplinarity advance arguments to legitimize their standpoint. It is nevertheless a convoluted debate, in particular because the Quebec Ministry of Education (MEQ) has not clearly taken a position, even though it has proposed curricular structuring and directives with a view to promoting interdisciplinarity in teaching practices.

Because this question is still on the agenda in the Quebec educational system and, in a sense, constitutes an increasingly important pillar of current curricular conception—although, as we will show, this importance is far from being explicit—it is important to examine the overall state of things to better understand the motives in play at various levels (political, economic, cultural, social, educational, etc.), as these motives are at the heart of profound transformations that have recently taken place in the Quebec educational system. The first section will describe the organization of the Quebec educational system, as well as the various curricular structures that have followed one another since the beginning of the 20th century, in order to contextualize the origin and evolution of the problem of interdisciplinarity in the educational system, which will be studied more particularly in the first part of the second section. The second part of this section will study the current situation in order to identify the dominant conceptions of interdisciplinarity and to underscore both the epistemological foundations underlying these conceptions and the conceptual, educational, and social stakes involved. As a result, it will be necessary to distinguish among the discourses of the government, of academics, and of the educational milieu. Finally, the third section will address teacher discourse on the subject of interdisciplinarity in the classroom, as well as its concrete application in their practices. The emphasis placed on primary school teaching is due to the fact that secondary school teachers have only recently been confronted with this orientation.

In this work, we will not take into account preschool education for an obvious reason: The concept of interdisciplinarity fundamentally requires

the presence of academic disciplines.² Nor will we consider the curricula pertaining to Quebec's Anglophone educational system or ethnic schools³ and their respective teaching practices. On the one hand, their curricula have mirrored those of French-speaking Quebec, at least in theory, since the 1970s; on the other, we have not led research on the practices of these teachers and are unaware of studies undertaken on their classroom integration of an interdisciplinary approach. We will focus on primary school teaching for two reasons. First, it is at this level of instruction that we find the question of interdisciplinarity and not at the secondary one, where it has only recently appeared, as we will see. Second, this presence of the issue of interdisciplinarity at the primary level has enabled our curricular analysis and research on related practices.

The portrait here presented is based on the results of research directed primarily by Yves Lenoir over the past 25 years on teaching practices, and especially on the implementation of interdisciplinarity in the classroom by teachers. All of the research in question is related to the activities of the Centre de recherche sur l'intervention éducative (CRIE), founded by Yves Lenoir in 1991, as well as to the Canada Research Chair in Educative Intervention (CRCIE), which he has held since 2001. This work is enriched by the contribution of Abdelkrim Hasni, whose doctoral thesis, supervised by Yves Lenoir, concerned interdisciplinary practices. Hasni is the founder and former director of the Centre for Research in the Teaching and Learning of Sciences (CREAS), and he investigates the didactic sciences issues.⁴

² Because the Quebec Ministry of Education uses the term "discipline" to describe the content presented in the various primary and secondary level programs of study, we also adopt this term but would like to specify that it refers to academic disciplines rather than scientific ones, as signaled, for example, by Develey (1995), Lenoir and Hasni (2006), Sachot (1993, 1998), and many others. We have chosen to use the term "academic subject," which we consider more appropriate for teaching content organized into distinct groups, to be able to address the distinction between "basic subjects" and "secondary subjects," as per the current discourse.

³ We should specify that this is in theory, as sometimes some of these ethnic schools do not respect educational regulations, often for religious reasons. They may also obtain certain exemptions and introduce into their curricula one or more programs related to learning the language and culture of origin.

⁴ In the Francophone tradition, didactics "is defined as the science of the study of teaching phenomena as concerns specific teaching content: in the first case (fundamental didactics), it focuses on the conditions for the production and transmission of knowledge and aims for the elaboration of a theoretical frame for studying the understanding of teaching phenomena, and in the second case (applied or norma-

1. Contextualization of the Educational System

1.1 A Historical Overview

It is important to specify from the outset that, as stipulated in the British North America Act establishing the Canadian Confederation in 1867, Quebec has at its disposal a provincial parliament that holds exclusive jurisdiction in certain domains—notably national defense and security—while it shares jurisdiction in others, such as immigration, with federal power. Education is thus an exclusively provincial prerogative and for Quebec, it has become an essential tool for affirming its Francophone specificity in North America and, as such, a marker of differentiation from the Anglophone Canadian universe in its American dimension.⁵

Each Canadian province therefore has its own educational system. In Quebec, this system has profoundly evolved since the beginning of the 20th century. Without entering into historical details, we would like to recall that the defeat of France following the Seven Years' War (1756-1763) led to the control by Great Britain of what became Eastern Canada (the current provinces of Quebec, Nova Scotia, and New Brunswick, which had been French since the 16th century). There followed various ups and downs, including a revolt of settlers of French origin (the "Lower Canada Rebellion") from 1837-1838, which, according to the recommendations of then-governor Lord Durham, could have led to the disappearance of the French and Catholic presence. But heightened tensions between the United States, which had gained independence following its Revolutionary War (1775-1783), and the British Empire—which resulted, among other things, in the War of 1812—led to an agreement between Anglophone and Canadian British power, Francophone political representatives, and the Catholic Church. Thanks to the resulting control it gained over French-Canadian society, the Catholic Church, for reasons of "survival" if not for its own survival (Bouchard, 2000), assured a delicate balance between obedience to a foreign power—and a heretical one, in its view, as it was Protestant—and the perpetuation of the French language, sure guardian of the religious tradition, as well as of the Church's cultural monopoly over its people. The Church therefore controlled the entire

tive didactics), research focuses on or is carried out in view of improving the teaching (Marchive, 2008, p. 68) of a given discipline.

⁵ It is worth mentioning however that, in recent years, the federal government has increasingly sought to intervene in the educational domains of the provinces, for example by creating the Canada Research Chairs and by offering Millennium Scholarships.

Quebec educational system, with the agreement of a conservative political power. Until the 1960s, through Neo-Thomism⁶ and partly based on political Ultramontanism,⁷ imported from Europe, which in Quebec took on the form of indirect if not parallel power (Monière, 1977), the Church imposed an educational model deeply anchored in Catholicism and rural values.⁸ This model was based on a traditional conception of Renaissance humanism, but reconfigured, by the Jesuits in particular.

After World War II, new economic requirements and transformations in Quebec society, along with significant demographic growth,⁹ led the new Francophone elite (technicians, engineers, administrators, high-ranking officials, university professors, etc.) to sense a serious economic “lag” in technological advancement and industrial development. They contested the traditional model of a society that had remained profoundly rural in structure, with the exception of Montreal and its immediate suburbs, which were far less ideologically and culturally homogeneous and already largely multiethnic where industrialization, through Anglophone capitalism, was already solidly implanted. The existence of numerous social, financial, legal, structural, and educational problems was brought to light in the 1950s. Global academic reform was then urgently called for in order to face the urbanization and industrialization of Quebec society. Following shifts in political power, the break from the past occurred at the turn of the 1960s through a powerful movement of social emancipation, liberalized values, and the affirmation of the Francophone identity, led by an “*indépendantiste*”

⁶ In political, religious and social matters, Neo-Thomism adopted and modernized principles formulated or completed in the 13th century by Thomas Aquinas and his successors.

⁷ The theory of Ultramontanism (that is, coming from the other side of the mountain, in reference to the Alps and therefore Italy) asserted the primacy of religious society over civil society. Its main dogma consisted in attachment to the Pope and the belief in his infallibility. It advocated the independence of the Church and the supremacy of clergy in educational matters.

⁸ Monière (1977) describes the resulting hegemonic current as follows: “Republicanism, secularism and the nationalism emancipating the lower middle class give way to clericalism, Ultramontanism, agriculturalism and defensive survival-oriented nationalism, the primary ideological themes of the clerical elite” (p. 184).

⁹ The demographic phenomenon that took place in Quebec between the 1870s and 1940s is called the “revenge of the cradle”; it was promoted by conservative religious and political powers that supported exceptionally high birth rates (families with 15-20 children were not uncommon) in order to increase the Francophone and Catholic presence.

party. What has historically been called the “Quiet Revolution”¹⁰ brought about major changes which, in the educational system, led to the creation of a ministry of education (*le ministère de l'Éducation*, or the MEQ) as well as the establishment of an investigating committee (Gouvernement du Québec, 1963-1965). This committee produced a report that would radically transform the Quebec school system and influence it to this day.¹¹

This report (commonly referred to as the Parent Report, after its president) rejects the humanist conception controlled by the dominant Catholic ideology in education, which was implemented in the “classical humanities” and in fact only addressed a minority of the population and sought the formation of an elite. The educational system was attacked on all sides and especially criticized for its encyclopedism and outdated teaching methods. The rest of the population, especially in rural milieus but also in industrial ones, had little or no education. Greater social expectations and various movements, including the feminist movement that developed in this period, called for a democratization of the school system. The investigating committee’s report advocated what it called a “renewed humanism” that, beyond the ideological discourse, aimed to replace Greco-Latin and literary instruction with scientific and technological instruction corresponding to the needs of an economic system whose society sought to enter advanced industrial postmodernism. Society became increasingly multiethnic with the massive arrival of immigrants from numerous countries who decreased social, cultural, and ideological homogeneity.

The question of interdisciplinarity is not addressed as such in the Parent Report, which nevertheless disapproves of the “real barriers [that] separate these various orders of knowledge” (Gouvernement du Québec, 1963-1965, vol. 2, sec. 10); it points out that “stress has often been laid on the bonds uniting the humanities and the sciences” (Gouvernement du Québec, 1963-1965, vol. 2, sec. 10); it denounces the “air-tight partitions between fields of study” (Gouvernement du Québec, 1963-1965, vol. 2, secs. 14, 24), particularly at the secondary school level. The report nevertheless considers that the fragmentation of knowledge could be beneficial in promoting exchanges and emulation among specialists. Faced with “the extraordinary multiplication of knowledge during the last three centuries ... the only

¹⁰ The revolution was indeed quiet, as, on the whole, the social changes involved in this radical break on all levels between 1961 and 1965 took place in relative calm, without violence (even if there followed a few excesses on the part of both mobilized groups and police forces).

¹¹ For a detailed presentation of the investigating committee’s impact, see Lenoir (2005).

universality henceforth possible is perhaps an initiation in the various ways of approaching truth, in the sense that these ways are successfully coordinated, or used one by one” (Gouvernement du Québec, 1963-1965, vol. 2, sec. 61). At the primary school level, education can only be general, no longer information but rather instruction, centered on the acquisition of basic conceptual tools required for future human development in general and secondary school education in particular. The report thus does not offer any interdisciplinarity approaches; it even appears to adhere to teaching by disciplines, at the secondary school level in any case, in order to begin the specialization process it promotes through a credit system. However, the report breaks with the traditional model of teaching and with the “general culture” (as instructional content in the classical humanities) with which it is associated, and promotes the learning of intellectual work by observing that “in order to earn one’s living, it is no longer sufficient to know how to read, write and count; it is necessary, in some measure, to ‘learn how to learn’” (Gouvernement du Québec, 1963-1965, vol. 2, sec. 61).

It is not possible here to present all of the major transformations that occurred over a few years and led to the control of the school system by the state, but this transfer of power from the Church to secular institutions was far from being as complete as it may seem, as the clergy had largely conferred power to governmental structures while keeping an eye on things through the Catholic Committee of the Superior Council of Education (SCE),¹² which was created at the same time as the Ministry of Education (MEQ). To permit a greater understanding of the text that follows, it is worth highlighting a few of these transformations: Schooling became mandatory for all young Quebecers under 16; teachers’ colleges were abandoned, and initial teacher education became the prerogative of universities in 1969, along with the creation of a state university with constituents across Quebec; a postsecondary educational system, the *cégep* (*collège d’enseignement général et professionnel*) was

¹² The Superior Council of Education, an advisory body independent from the Ministry of Education, was created in 1964; its mandate is to advise the MEQ on educational matters. At the time, the Council included a Catholic committee as well as a Protestant one to ensure the continuity of the denominational system which since 1875 had been governed by the Council of Public Instruction. Both councils were dissolved in 2000 when the denominational structure of the educational system was replaced by a linguistic one (Anglophone and Francophone). Right from its creation, the Council appointed four boards covering the four levels of education (preschool and primary education, secondary education, *collégial* education, university research and education), to which was added the Commission on Adult Education and Continuing Education.

created as a preparatory school for university education (two years) or as a school for technical training in view of the job market (three years); etc.

We have hypothesized that this report was at the source of a succession, in continuity, of three Quebec educational system reforms over the next 40 years. These reforms, drawing on a changing and ideologically transhistorical discourse—that is, humanism reinterpreted over the years—smoothly and gradually led, in the context of globalization, to the establishment of an educational model corresponding to the pragmatic and instrumental North American conception, a model inscribed in today’s economicist and neoliberal logic (Lenoir, 2002). As pointed out by Burbules and Torres (2000), “the neoliberal version of globalization ... is reflected in an educational agenda that privileges, if not directly imposes, particular policies for evaluation, financing, assessment, standards, teacher training, curriculum, instruction, and testing” (p. 15). This is precisely what is occurring in Quebec. The school population is to be managed as a consumer of knowledge and transformed into “human capital” prepared to function upon the completion of studies (a “pedagogy of service”).

1.2 The Quebec School System

Before presenting the various Quebec curricula that have followed one another over the course of the 20th century, we must provide a minimal description of the Quebec school system. The Government of Quebec allots considerable sums to the education sector, which is considered essential: 7.4% of the GDP was devoted to education in 2007-2008, compared to an average 6.2% in the other Canadian provinces (Gouvernement du Québec, 2009a). As a budget item, education is second only to health care.

The education network is made up of both public and private, Franco-phone and Anglophone institutions and serves a population of 7.5 million. It also includes schools organized by ethnic group (Jewish, Greek, Armenian, etc.), concentrated essentially in the greater Montreal area, where most immigrants reside. Since the 1970s, all institutions must be recognized by the MEQ and must apply the same standards and programs of study. The school system is largely centralized, as in France. The MEQ assumes all responsibilities, some of which it delegates to school boards.¹³ Among

¹³ A school board is a legal entity to which the MEQ has delegated its powers in order to manage primary and secondary schools, over a given territory, in terms of organization, financial matters, pedagogical concerns, etc. Those in charge of each school board—72 commissioners in Quebec at the moment—are democratically

other things, the MEQ is responsible for budget rules, the production of curricula, the evaluation of textbooks and evaluation for certification and for conferring degrees; it also holds bargaining power with teacher unions when it comes to collective bargaining agreements governing teacher rights and responsibilities (Gouvernement du Québec, 2009b). However, over the past few years, a certain amount of organizational, financial, and pedagogical¹⁴ responsibility has been granted to schools with the creation of school boards (Gouvernement du Québec, 2009b).

The educational system is currently made up of four levels of education (Gouvernement du Québec (2009c):

- two years of preschool education, the first year being optional (4 to 5 years of age);
- six years of primary education, organized into three two-year cycles (6 to 11);
- five years of secondary education (two cycles, the first two years in length and the second three years in length) whose two or three final years can be geared toward training for employment rather than general education (12 to 16);
- two years of general *collégial* education for students preparing for university (17 to 18) or three years of *collégial* instruction for technical training;
- university education, including
 - a three-year bachelor's degree in most cases, but four years for medicine, engineering and education students—whether specialized in preschool, primary, or secondary education (19 to 22);¹⁵

elected by the whole of the population in the given territory.

¹⁴ In the French tradition, “pedagogy” has a number of meanings. In this article, it is used in three distinct senses: first, as a characterization of the teacher’s action in class, which is the case here, and this is related to a globalizing approach to the teaching phenomenon; second, as a generic characterization of an educational current (for example, humanist pedagogy, which will be addressed further on); third, as a specific characterization of the teacher-student relationship in the classroom context, at the organizational, relational and socio-affective levels (the psychoeducational relationship), as opposed to the didactic relationship characterizing the link made by the teacher to disciplinary knowledge to facilitate student access to this knowledge in teaching/learning situations. In this last sense, “as a ‘practical theory’ based on experience, pedagogy is above all knowledge *of* and *for* practice, with a practical aim” (Marchive, 2008, p. 128).

¹⁵ It should be noted that the teaching salary at the preschool, primary, and secondary levels is established by an agreement between the Government of Quebec and

- two types of master’s degrees, usually two to four years in length, namely one professional degree primarily intended for practitioners (working teachers, for example) and the other for research training;
- two types of doctorates, three to five years in length, namely one professional degree and one degree for research.

Roughly 1.8 million (out of approximately 7.5 million inhabitants) are enrolled in one of these levels of education, whether full or part time (Gouvernement du Québec, 2009a). Education is free at the primary, secondary, and *collégial* levels. Tuition fees are required at the university level; however, in the North American context they are quite low. Quebec has three Anglophone universities and four Francophone universities, including one state university with institutions across the province. Over 600 regular and full-time university professors work in the field of education (Gouvernement du Québec, 2009a).

2. The Evolution of the Concept of Interdisciplinarity Since Its Original Use

2.1 A Terminological Clarification

Before examining the evolution of the concept of interdisciplinarity in Quebec curricula, we would like to adopt and clarify a few terms related to it, albeit without going into detail.¹⁶

- Monodisciplinarity (or unidisciplinarity) refers to the involvement of one single discipline;
- Multidisciplinarity simply refers to the involvement of two or more disciplines, without specifying the presence or absence of links between them, or the types of links established;
- Pluridisciplinarity refers to the basic juxtaposition of two or more disciplines and therefore implies the absence of any kind of direct link between these disciplines;¹⁷

teacher unions, and that it is currently the same for men and women and regardless of teaching level, based on 17 years of schooling. Wage scales are therefore determined only by the number of years of teaching experience.

¹⁶ For an in-depth discussion of various terminological definitions, see Lenoir (1991, 2001b) and Lenoir, Geoffroy, and Hasni (2001).

¹⁷ As Klein (1990) specifies, pluridisciplinarity consists in disciplinary specialists working side by side in an additive way—with no integrative effect, in the words

- Intradisciplinarity refers to the interrelations established in one same discipline or area of a discipline based on its internal logic. For instance, intradisciplinary links can be made between geometry, arithmetic, and algebra, as these are all components of mathematics. In education, it is also possible, for example, to conceive of the establishment of links between history, geography, and economy as humanities;
- In its broader sense, interdisciplinarity is often used as a generic term to designate any type of link that can be made between disciplines. Using the term polydisciplinarity would surely be more useful;
- Strictly speaking, interdisciplinarity refers to real interactions between two or more disciplines concerning their concepts, methodological procedures, techniques, etc. It is therefore incompatible with any kind of cumulative perspective, as it imposes authentic interaction. We will come back to this definition further on in order to apply it to academic interdisciplinarity;
- In our view (Lenoir, 2003), transdisciplinarity is an ambiguous notion, as it can have at least four distinct meanings. It can be understood, first of all, in the sense of cross-disciplinarity between two or more disciplines (across); second, in the sense of exceeding a discipline, leading to scientific unity based on a group of unifying principles, concepts, methods, and goals acting on a metascientific level (beyond) as conceived by Nicolescu (1996) and the CIRET, for example; or, third, as understood by D'Hainaut (1986), in the sense of focusing on behaviors (below). Fourth, it is also used instead of the term "interdisciplinarity," thereby undermining its own relevance. Finally, there is one sense that we consider significant: that of cross-disciplinary mobilization in the context of a project, as understood by Fourez (2002);
- Finally, we would like to propose the term circumdisciplinarity in the context of professional training, including that of teachers, so as to take into account knowledge other than academic and disciplinary knowledge (experiential knowledge, common-sense knowledge, knowledge of otherness, etc.) that practitioners

of Petrie (1976). See Lenoir (1991) and Lenoir and Sauv  (1998a). In the academic context, pluridisciplinarity is often characterized by a thematic approach in which a question is addressed separately by different academic disciplines, the only common thread being in fact the theme in question.

incorporate into their practices and that partially characterizes professional practices (Lenoir, Larose, & Dirand, 2006).

2.2 *The Various Teaching Curricula Since the 1960s*

Six curricula for the preschool, primary, and secondary levels have been produced and implemented over the past 100 years. We will study this progression by describing the characteristics of each primary teaching curriculum as well as its different types of underlying rationales. We will also underscore the place of interdisciplinarity in each of these curricula, the discourses that legitimized this place, and the attributes given to interdisciplinarity. We examine teacher discourse and practices in the following section.

Table 1 below summarizes the successive curricular conceptions of primary and secondary education since the beginning of the 20th century by presenting the principal curricular characteristic attributed to it by governmental authorities, as well as the underlying epistemological posture according to the results of curricular research.

Table 1
Successive Curricular Conceptions in Quebec Primary Education
1909-2000

Years	Curricula	Epistemological conceptions
1909-1959	Encyclopedic program	Realist conceptions
1959-1971	Encyclopedic program	Realist conceptions
1971-1981	Framework programs	Humanist conceptions
1981-2000	Programs based on behavioral objectives	Neobehaviorist conceptions
2001-...	Domain- and competency-based programs	Constructivist and behaviorist conceptions

Based on the contextual background we have presented, we propose that the movement of reforms from the 1960s to today has been sustained using humanism¹⁸ to ideologically legitimize school system transformations: First a renewed humanism (Gouvernement du Qu bec, 1963-1965), that of

¹⁸ See Lenoir (1991, 2005) regarding criticism of the conception of the humanist curricular perspective in the Quebec educational system reform in the 1960s.

humanist pluralism, led to the abandonment of the French model founded on the humanities and a certain elitist conception of culture; then in 1980 a curriculum centered on the value of intercultural relationships (cultural pluralism) and on a neobehaviorist conception of learning, following the humanist pedagogy in the 1970s focused on the realization of the individual (Lenoir, 2005). Let us examine this further.

2.3 Description of the Various Curricula

2.3.1 The two first curricula (1909 to 1971): To describe the Quebec curricula, we will focus on primary education, as, up until 2001, secondary curricula were conceived according to a strictly disciplinary structure. The current secondary curriculum adopts an interdisciplinary perspective which, as we will see, closely corresponds to that of the primary school.

In the 20th century, a first reform took place in 1909, with the disciplinarization of primary and secondary education in North America. These curricula were encyclopedic, with realist epistemological foundations, centered on the accumulation of knowledge presented as preexisting information to be memorized under the control of the Catholic Church to such an extent that the period from 1875-1964 has been called that of “the school beneath the miter” (Lefebvre, 1980).

It is only in 1959 (Gouvernement du Québec, 1959) that the primary curriculum was revised. It nevertheless varied little from the preceding curriculum, since it was still the product of a conservative ideology based on a vision of self-protection through traditional values and culture as well as through the Catholic religion.¹⁹ Moreover, this curriculum was presented by the superintendent of the Department of Public Instruction in terms of “changes in details” (Gouvernement du Québec, 1959, p. 3), in a perspective of continuity with preceding curricula. The main objective of such a curriculum, within a primary and secondary school system whose “organizational setting ... barely changes” (Gouvernement du Québec, p. 3), is to “understand that in the first few years, the subjects essential to the education of mankind [sic], of the citizen, of the Christian are religion, the native language, arithmetic, along with a little history and geography, as well as practical knowledge of other disciplines that can be introduced more formally as the child’s mental development permits” (Gouvernement

¹⁹ For example, the program of catechism (and not of religion, as it would only later be called) takes up half of the document presenting the totality of curricular programs of study (308 pages out of 620).

du Québec, p. 6). The teaching of academic disciplines therefore appears to constitute a mere extension and reinforcement of religious education, consistent with dominant socio-ideological orientations. Centering on the memorization of countless facts is inscribed in the cumulative and additive conception that characterizes an impoverished “general culture,” that of “a head well filled” and of preselected “ready truths.”

Using Not’s (1979) typology, we can establish that this type of curriculum promotes traditional methods of cognitive heterostructuring, and thereby a process of revealing pre-established knowledge (teacher-centered education), through exposition and imposition or through imitation of past models and saturation, by means of different intervention modes: lectures, “exercization,” repetition, mimetic reproduction, and memorization, for example. Learning is seen as a heteronomously controlled process of structuring, a receptive process in which the student basically remains a receptacle.

In short, the grip of a certain “general culture,” together with a most traditional conception of education and a growing shortage of schools, qualified teachers, textbooks, etc. (Charland, 2009), was so strong until the 1970s that the consideration of interdisciplinarity had not the slightest *raison d’être* in these two curricula. Essentially, education was at best disciplinary, in the word’s broadest sense of any instructional content presented as a unified whole. In fact, a number of disciplines taught were primarily instrumental (for instance, reading, arithmetic, calligraphy, drawing)—although this in no way excluded the clerical-nationalist influence in curricula. Other disciplines had stronger ideological content: history, (Laforest, 1989), agriculture, home economics, propriety. If a “unity of knowledge” did exist, it could only be in a cumulative perspective in the context of a group of convictions progressively assimilated through a well-controlled transmission process. The primary objective of education was therefore not to instruct, but to inculcate, to convince, to transmit a system of dogmatic values.

2.3.2 The curriculum based on “framework programs” (1971 to 1981):

Following the “Quiet Revolution” and the aforementioned Parent Report, along with the transformations they brought about—including the profound restructuring of the school system—a new curriculum was finally implemented starting in 1971. Cultural pluralism, which had been advocated by the Parent Commission, was re-expressed in terms of the humanist pluralism on which hinged the reform (ideologically and pedagogically speaking); this humanist pluralism took on the form of a “humanist and

pluralist pedagogy,” in the sense that numerous and sometimes opposing and competing educational models were proposed.

In the pluralist perspective thus defined, reinforced by a desire to democratize education and inspired by American currents of thought (Bélanger, 1972) advocating individual growth, autonomy, and realization in a context described as “non directive,” the MEQ, in 1968-1969—supported by the pressure of social events—proceeded to profoundly reorganize the school system, from preschool to university. It revised program organization and producing framework programs called for by the Parent Report, which would be progressively applied in the early 1970s.

These new programs²⁰ were directly inspired by currents said to be humanist (or organic, as opposed to traditional currents said to be mechanical), prevailing in the United States at the time under the influence of Rogers in particular. Their conception is closely related to the pedagogies described by Not (1979) as pedagogies of cognitive self-structuring. These conceptions contrast with models based on a transmission-reception process (traditional or co-active heterostructuring) and with the abuses of stereotypical and book-based education. They include a multiplicity of different educational propositions with different individual or social aims according to the options chosen. They lead to a radical change in centering. Educational intervention is no longer guided by the knowledge to be taught, but by the learning subject (subject-centered education). The aim is no longer to (trans)form human beings, but rather to allow them to (trans)form themselves. Intervention is thus conceived and oriented, at least theoretically, according to their needs and interests, according to the realization of these needs and interests in the context of personal aims. The responsibility for learning is thus placed on the learning subject, who must have recourse to one procedure or another—most often empirical or inductive—to reach his or her aims. The teacher consequently takes on the role of facilitator after having awakened or

²⁰ Strictly speaking, it is imprecise to refer to a curriculum or to programs of studies, as it is only in 1971 that the MEQ published a document entitled *Orientation nouvelle des sciences humaines au primaire*, which even then did not constitute a program in the legal sense of the term. In fact, the previous programs were still officially in effect, but the document allowed schools to “try out the new ... orientation” (Gouvernement du Québec, 1971, p. 2), and this well demonstrates the transitory nature of the operation that allowed, on a political-administrative level, for a unification of Francophone and Anglophone programs, until then distinct. Socio-ideologically speaking, it allows for a rupture with the previous model in the name of a change that is nevertheless inscribed in continuity.

channeled student interest. Learning essentially resides in a spontaneous (non-directed) investigation process, followed by random structuring.

This context provided the backdrop for the emergence of interdisciplinarity, but in highly ambiguous terms. Indeed, due to this organic conception of school instruction eliminating academic disciplines and their content from its main preoccupations, these framework programs do not propose interdisciplinarity approaches. Learning content is above all experiential and existential rather than cognitive, since the cognitive process is associated with the mechanical conception according to which “the student is a passive being who is told to listen to the teacher and store information” (Superior Council of Education, 1971, p. 45). It is even expected that students, whether at the primary or secondary level, will, “in a certain measure, [be able to], construct their own program” of which they become “co-authors” (Grégoire, 1987, p. 89). The promoters of this conception thus reacted against the formerly dominant model, considered to be mechanical.

While versatility essentially concerned the organization of teaching in secondary education, since, in the discourse, it constituted “the essence of the renovation of our secondary education,” (Superior Council of Education, 1972, p. 68), it also required decompartmentalization at the primary level. That means an elimination of barriers between teaching staff, between instruction and education, between education and student life in terms of schedules and material resources, and even between different physical classrooms. The school could thus become a “living environment” integrating courses, student life, and personal growth. Consistent with the predominant educational model at the time, the emphasis was placed on conviviality and human relationships rather than on cognitive learning specified in the curriculum.

As a result, the preoccupation with interdisciplinarity could not truly emerge. The accent was on primary students’ integration of learning, and this learning was socio-affective, oriented toward the capacity to ensure well-being and social integration. It is with this vision of the goals of education that the report calls for “respecting the principal versatility already existing in the school system and to which we now only grant absent-minded attention, that is, each student’s originality and uniqueness” (Superior Council of Education, 1971, p. 50). In the spirit of the authors of the report, versatility therefore equates with the recognition of each human being’s uniqueness, hence the need for individualization in education. It is in this context of minimization of the importance of academic disciplines and cognitive content that the notion of integration of subjects appeared: an amalgamation was allowed because the school’s *raison d’être* was socialization rather than instruction.

2.3.3 The curriculum based on behavioral objectives (1981 to 2001): The curriculum of the 1970s in fact constituted only a transitory measure, as the MEQ soon announced the arrival of a new curriculum, which would only be implemented in the early 1980s. In essence, the curriculum of the 1970s facilitated a certain rupture with the traditional teaching model, which was still very present.

In fact, even before the framework programs were implemented, the MEQ had been planning since the early 1970s to produce a curriculum that would be more structured and more consistent with global ideological and technocratic orientations. The Ministry was especially motivated to undertake this process because “no sooner have schools begun to live with the new programs than strong criticisms have been leveled at them from all sides” (Grégoire, 1987, p. 103). As soon as 1972, the MEQ was set upon reconsidering the program of studies in a different perspective: “the orientation that [senior management] adopts and intends to adopt to elaborate its objective-based programs” (Pelchat, 1972, p. 3). Did that not mean, though, the enabling of the realization of one of the goals advocated by the Parent Report, that of an education geared toward technology and the economy?²¹ Hence, economic development was prioritized above the defense of the cultural status quo. The school must be able to train appropriate human resources to ensure this development; it must produce “human capital” inscribed in a commercial economist and neoliberal logic.

Characterized by its strong adhesion to neobehaviorist thought, this new curriculum was structured in terms of behavioral and hierarchical instructional objectives. It differed from the two preceding curricula in its concern for rationalizing the intervention process, as well as the manner in which it made use of the subject’s concrete action in learning objectives. In

²¹ Two excerpts from the Parent Report indicate this orientation well. Beneath the title “Requirements of Education in Modern Society,” the following appears: “The laborer who had succeeded the artisan has now given way to the technician. A few hours of training no longer suffice to train a technician; a fairly developed general education is required at the base ... [In the factory] Mechanization and automation require more senior personnel; the programming of operations, organization of work, auxiliary production services (purchase, selling, planning, etc.) require strong teams of specialists and technicians” (Gouvernement du Québec, 1963-1965, vol. 1, secs. 91-92); “It is thus necessary to ensure a high level of instruction for all, to prepare executives for all sectors and especially to provide advanced training for the growing fraction of the population preparing to work in the tertiary sector ... If these conditions are not met, economic life may slacken and the nation may lose its rank” (Gouvernement du Québec, 1963-1965, vol. 1, sec. 94).

fact, this action is directed by an outside agent who remains the real subject, the learning subject being a mere “subjugated subject,” an apparent subject who reacts to stimuli. Thanks to the teacher who gradually “reveals” it, the subject “discovers” knowledge as it “must” be understood (object-centered education). Learning is seen as a heteronomously controlled structuring process that is followed by controlled investigation. The process is in fact one of inculcation that favors a coercive model of heterostructuring.

A new form of program organization was introduced and progressively applied in the 1980s. It planned for a new prescriptive distribution of disciplines at the primary level. This organization did not in fact constitute a radical change compared to what had existed in the preceding decade. What really changed at the primary level (and at the secondary level to a lesser extent), beyond certain relatively minor modifications, was the announcement of the obligation to introduce these disciplines on a weekly basis, to devote a certain period of time to them, to pursue objectives specified in programs of study, and to apply measures relative to the evaluation of learning. All of the aspects of the teaching/learning relation were therefore addressed. The notion of pedagogical supervision was also introduced to describe the formative assessment of teaching actions, that is, observation, analysis, and interpretation processes by which school boards—through school administrations—ensure consistency between educational policies and practices and decide on actions to undertake in order to maintain, correct, or improve observed situations.

The implications of a shift had assuredly not been evaluated seriously: from an objective-based pedagogy and its teaching over the course of the 1960s, or on children and their ability to take charge of their personal realization in the 1970s, to a pedagogy centered on the learning of predetermined content (and, what is more, content established according to a hierarchical structure of behavioral objectives presented as observable and measurable with which teachers were hardly familiar). Pedagogy remained largely traditional, as observed by the Superior Council of Education (1988).²² Consequently, the textbooks ultimately published very often reflected this traditional current

²² “If one had to put it in just a few words, it would be necessary to affirm ... that the current primary school has conserved a rather traditional educational approach. This approach can be observed in orientations related to pedagogical practice, in educational organization, in curricula, in teacher education and development and in teaching conditions” (Superior Council of Education, 1988, p. 57). Further on, the Council specifies that, when it comes to pedagogical practice, “on the whole, teachers lecture, make little reference to everyday life and teach subjects in a fairly separate manner” (Superior Council of Education, 1988, p. 57).

of thought, even if their visual presentation strived to be stimulating and diversified.

This is the context in which interdisciplinarity developed or, more precisely, “the integration of subjects” that had confusedly emerged over the course of the preceding decade. In June 1982, the Superior Council of Education published a document entitled *Le sort des matières dites “secondaires” au primaire*, which, based on an enquiry led by the Council’s Commission de l’enseignement primaire and on a number of collected testimonies, took stock of the observed situation, analyzed it and presented its recommendations. The results show that the “minor subjects” or “secondary” ones, particularly the humanities, natural sciences, and arts, were rarely or never taught by 60% of teachers, who could devote the time thus allocated to teaching French and mathematics.

In terms of the coherence in education in which it was especially interested, the Commission insisted on the necessity of affirming the priority of the learning subject and of considering this person as a “‘global’ being called to a ‘global awakening’” (Superior Council of Education, 1982, p. 16), an individual introduced into a given environment so as to be at the heart of a pedagogical activity. The proposed orientation therefore goes in the direction of the integration of subjects, which is “the result of a long process. The main context for this process is the occasion presented by an activity, in which objectives specific to different disciplines are associated and treated as concomitant” (Superior Council of Education, 1982, p. 19). The commission ensured that such practices were already in place: “More than 60% of teachers state that, in this manner, they integrate teaching of the native language, art, humanities, natural sciences and mathematics” (Superior Council of Education, 1982, p. 19). The commission cautiously underscores that “all of these data should nevertheless be interpreted with caution, since it is impossible to know what each respondent understood by ‘integrate’ or what they practiced as ‘integration’” (Superior Council of Education, 1982, p. 19).

In 1989, it continued in this direction by considering that one of the three priority avenues of action to explore

concerns the integrated teaching of subjects. This consists in establishing activities that aim to reach objectives of several disciplines simultaneously, thereby reducing the distance between the globality of reality and the perceptual modes of children. Rather than pursuing disciplinary objectives successively and separately, it is a question of taking advantage of the possibilities offered by primary

teachers’ unique position and integrating, in richer activities, different but converging objectives: The natural sciences lesson can therefore also be a lesson on mathematics, environmental studies, etc. (Superior Council of Education, 1989, p. 23)

The council was taking up the same considerations already advanced, namely that the integration of subjects is not a panacea, that it in no way exhausts the range of possible pedagogical methods or excludes the disciplinary approach. The document nevertheless emphasizes two new aspects worthy of mention: On the one hand, the integration of subjects “does not do away with the need to introduce approaches specific to each discipline” (Superior Council of Education, 1989, p. 26) and, on the other, it “requires that each teacher have an advanced mastery of program structure and content” (Superior Council of Education, 1989, p. 26). Moreover, “all that can be done to promote this personal appropriation is therefore also a form of learning related to the integration of subjects” (Superior Council of Education, 1989, p. 26).

Hence, the position of the Superior Council of Education concerning the integration of subjects became increasingly nuanced and the Council gradually highlighted the need for a set of conditions required for gradual progress in this direction, as well as the need for respecting the characteristics (objectives, content, and procedures) of each program of studies—which indeed implies sufficient mastery of all of the programs.

The 1980s consequently saw an explicit manifestation of preoccupation about the integration of subjects—as undifferentiated from interdisciplinarity—which took on increasing importance. The integration of subjects became a notion allowing for the salvage of certain elements, that is, for proposing an administrative solution maintaining both the legitimacy of program organization and the idea of humanism in the overall development of human beings, while presenting a compromise with the behaviorist vision already present in curricula.²³ The integration of subjects, which had already been a sort of success story in Quebec in the discourse since its introduction in the previous decade, then became a *modus operandi* for solving problems related to the application of curricula and to current program organizations.²⁴

²³ Until about 1995, the MEQ, both concretely and in the discourse, supported the notion of integration of subjects, which it associated with interdisciplinarity. It provided exceptional financing for the production of pedagogical documents by school boards. We have studied this production, which was in fact hardly interdisciplinary in nature (Ratté, Lenoir & Larose, 2006).

²⁴ What we wrote in 1992 appears still to be relevant today: “The recourse to

It was in fact already supported by school administrators (Bacon, 1996) who were stuck between the constraints of current program organization and social expectations that promoted—and, as we will see, continue to promote—the teaching of French and mathematics.

First justified by a teaching perspective said to be organic, the idea of integration of subjects was recovered by the MEQ in the 1980s for reasons of economy within the system, as a way to overcome an impasse using administrative or pedagogical methods. Then, with curricula under control—that is, mostly not applied—the integration of subjects largely served to legitimize the perpetuation of a previous status quo for a number of primary teachers, or for primary level teaching essentially centered on French and mathematics. A study of 50 or so pedagogical activity propositions or descriptions published in Quebec journals between 1970 and 1990 (Lenoir, 1991) has revealed that, due to a lack of rigorous comparative analysis of programs of study at the curricular level that could have shown the didactically appropriate complementarities and convergences among the various types of knowledge and methods, the integration of subjects was often no longer anything more than the shortest path to the disintegration of learning and of knowledge.²⁵

2.3.4 The competency-based curriculum (starting in 2001): The neo-behaviorist perspectives, which had followed a strong humanist current and had marked the Quebec school system beginning in the 1980s, were progressively discarded by various organizations and academics, especially as the MEQ had itself observed in 1990, following an investigation, that these programs were rarely or never applied, and were not in fact applicable (Gouvernement du Québec, 1990). Repeated criticism led the Superior Council of Education (1990, 1993, 1994, 1995), among others, to recommend abandoning orientations in effect in favor of a constructivist conception. It is interesting to observe that documents from the Council

interdisciplinarity or to the integration of subjects in the current context would only superficially modify teaching practice for a large portion of primary school teachers. . . . The integration of subjects would thus become for the classroom teacher an excellent way to maintain a hegemonic teaching of French and mathematics while giving the impression of teaching the other subjects, using them as pretexts or material, or even ensuring their strictly minimal instruction” (Lenoir, 1992, p. 46).

²⁵ This same observation made in 1984 following an analysis of two curricular reorganizations in two Montreal schools led the first author to undertake doctoral studies on the question (Lenoir, 1991). The author also studied the notion of integration in depth (Lenoir, 1992; Lenoir & Geoffroy, 2000).

adopted a position which would go from supporting the neobehaviorist approach of behavioral curricula to moderating and then opposing this curricular orientation.

The 1991 document of the Superior Council of Education addressing secondary school education demonstrates a radical change in perspective in terms of the concept of integration. The central concept in question is that of integrating knowledge and no longer that of integrating subjects. The Council thus intended to adopt a dynamic point of view and to “re-center on students, on their learning processes and development, on their needs and their desire to learn” (Superior Council of Education, 1991, p. 2). Largely inspired by the work of Artaud (1981, 1989), the document focuses on learning processes and the term “integration of knowledge” encompasses what is called, in the United States, integrating processes, as well as integrated knowledge, an integration resulting from these processes. Artaud (1981) considers that “the integration process first aims for awareness of this new knowledge, which took shape as theoretical knowledge modified experiential knowledge. . . . The word ‘integration’ precisely signifies that this new knowledge can only take shape by becoming integrated into the personality and changing it. If, in fact, individuals’ perceptions of their world that enter into their self-image are modified, it is their entire self-image that is modified” (p. 149).

There followed increasingly virulent criticism of the curriculum and the integration of subjects, with extremely severe judgment of the curriculum in place. For the Superior Council of Education, which in 1994 harshly criticized this curriculum, although the MEQ began encouraging the integration of subjects as soon as 1982, it was “in a sort of (‘faulty’) acknowledgment of failure” (Superior Council of Education, 1994, pp. 52-53). The curricular structure elaborated in this period did not allow, in its compartmentalized organization, for the establishment of convergences, or coherence . . . which had been forgotten by the planners. The atomization of content afflicting programs of study (some 3,000 objectives) “does not particularly facilitate a perspective of integration of subjects” (Superior Council of Education, 1994, p. 53).

Indeed, one of the many problems confronting teachers on a daily basis was the large number of objectives in each program of studies. This led the MEQ to promote the notion of integration of subjects, which, according to a deputy minister of education at the time, was defined “in the organization of teaching that allows the teacher, in proposed learning and evaluation situations, to make links between one or more or even all of the disciplines” (Vézina, 1992, p. 314).

In short, after 10 years of debates including the Estates General on

Education²⁶ in 1995-1996 (Gouvernement du Québec, 1996), two major government reports (Gouvernement du Québec, 1994, 1997a), numerous documents from the Superior Council of Education and a new government educational policy (Gouvernement du Québec, 1997b), the MEQ introduced in 2001 a new curriculum aiming at addressing a number of social problems, including academic perseverance and success, as well as social equity in education. But it also targeted educational effectiveness and the efficiency of the school system in line with current ideological-political and economic orientations. The curriculum for the first cycle of secondary school appeared in 2003 and the curriculum for the second cycle, in 2007.

The new primary curriculum²⁷ (Gouvernement du Québec, 2001) chose the epistemological foundations of constructivism and behaviorism, though they had been socioconstructivist and cognitivist in the semi-final version (Gouvernement du Québec, 2000).²⁸ Its principal orientations consisted of centering on the student as learning subject, calling for “fundamental and functional learning [that is] up-to-date and culturally anchored . . . qualifying and differentiated” (Gouvernement du Québec, 2001, pp. 3-4); the recourse to cross-curricular and interdisciplinary perspectives; a program approach ensuring the grouping of academic disciplines by learning area; a return to “essential disciplinary knowledge”; a conception of teaching/learning activities centered on the establishment of learning communities; a structure of learning cycles; emphasis on culture and the introduction of new perspectives brought about by social preoccupations, such as environmental education, health education, consumer education, citizenship education, etc.

The realization of these foundations in the primary curriculum must take place, according to the official document, through a systematic recourse to disciplinary and cross-disciplinary competencies. Disciplinary competencies are grouped into five learning areas (languages, mathematics, sciences and technologies, history, arts, personal development) to promote interdisciplinary education. Generic in nature, the cross-curricular competencies are intellectual, methodological, personal and social, and communication-related. They must

²⁶ The Estates General on Education consist of a large one-year consultation between the Government of Quebec, the entire Quebec population, representative organizations and various activity sectors, concerning the orientations of the educational system.

²⁷ The two secondary curricula have the same foundations, orientations, and structure. They essentially differ only in content.

²⁸ For a critique of the epistemological foundations of the new curriculum, see Lenoir (2001a) and Lenoir & Larose (2005).

be realized “across the various learning areas” (Gouvernement du Québec, 2001, p. 15). Finally, five broad areas of instruction (health and well-being, orientation and entrepreneurship, environment and consumerism, media, living together and citizenship) are meant to ensure learning anchored in the human and social realities of everyday life.

In each of these programs, learning objectives are expressed in terms of competencies for all cycles concerned. Each competency is presented with an explanation of the competency, its links with the cross-curricular competencies, the context of realization of the competency, the student’s predicted learning path, the key features of the competency, evaluation criteria for the competency and expectations for the end of the cycle. A list of prescribed “essential knowledge” is provided at the end of each program.

By implementing this curriculum, the MEQ, beyond the aforementioned aims, seeks to lead primary teachers to adopt new practices to promote student acquisition of essential learning determined by the curriculum (to instruct), to develop social attitudes and conduct in line with the rules, standards and values of society (to socialize), and to ensure the academic success of the greatest number of students (to provide qualifications). These are the three missions given to schools by the Government of Quebec (1997b). In the view of politicians and administrators as well as many academics, this would represent a major change required of teachers in their teaching processes. Based on Cuban (1988), Fullan (2001) points out that the current reforms do not ask teachers merely to improve what they are already doing (first level of change), but rather to do things differently (second level of change).

Let us now examine the interdisciplinary perspective in the primary curriculum. The term “interdisciplinarity” is not mentioned in the presentation of orientations of the primary curriculum, except as “interdisciplinary collaboration” (Gouvernement du Québec, 2001, p. 6). Instead, there is mention of “disciplinary decompartmentalization” (Gouvernement du Québec, 2001, p. 5), which aims to “establish as many and as varied connections as possible among related subjects—which does not rule out establishing connections among subjects belonging to different subject areas” (Gouvernement du Québec, 2001, p. 5). Its goal is thus “to help students perceive the connections between their various learnings” (Gouvernement du Québec, 2001, p. 5). The term is only used in two other places over the document’s 350 pages, including one time in the French program with the specification that “although each competency retains its specificity, it is especially in their interrelation that the competencies are developed, notably in the context of interdisciplinary activities and project-based learning” (Gouvernement du Québec, 2001, p. 73).

In the second cycle of the secondary curriculum, interdisciplinarity is mentioned in only a few places, in terms identical to those of the first cycle of secondary education. The situation is very different in the first cycle of secondary school, in which the term is frequently employed to discuss interdisciplinary cooperation, contemporary interdisciplinary problems related to the general areas of instruction, interdisciplinary projects, interdisciplinary learning activities, the potential of interdisciplinarity, etc. Moreover, the mathematics, arts, sciences, and technologies programs of this curriculum use the term fairly often, as does the “English as a Second Language, Core Program.” This last program provides an elaborate example of an interdisciplinary activity, but the example illustrates well a crucial and fundamental problem—the absence of a definition of the concept or of its attributes by the MEQ. This lack of conceptual clarification leaves the door open for any interpretation of interdisciplinarity, as demonstrated for instance by the second language program, which, by its thematic structure, relates more to pluridisciplinarity, as the activities presented each concern a different academic discipline in an additive sense.

It is equally interesting to note that the curriculum for the second cycle of secondary school imposes the realization of a final integrating project. This measure is legitimized by the existence of the competency-based approach, by the need for an active pedagogy and by the fact that similar formats can be found in France, the United States, and Great Britain. Integration is defined as “the ability to clearly make connections between elements of learning, to recombine them in various ways and to put them to use in order to adapt to new situations” (Gouvernement du Québec, 2007, chap. 11, p. 2). It should be highlighted that the roles attributed to students in the realization of such an integrating project, as well as the roles expected of the teacher, refer neither to cognitive content, nor to academic disciplines. They concern organizational, socio-affective, relational, and pedagogical dimensions. It is true that no interdisciplinarity relationship is ever mentioned. What types of links are students called on to establish in their learning? And what is the learning in question?

We wish to conclude this section by calling attention to the fact that the grouping of academic disciplines into learning areas assuredly expresses a preoccupation for the establishment of interdisciplinarity links, hence for interdisciplinarity. However, although the new curriculum calls for going beyond the disciplinary architecture of closed and juxtaposed boxes that long reigned in Quebec primary and secondary education, the curricular structure is not without posing serious problems, particularly at the primary level. The

first problem concerns the elimination of humanities (history-geography) and natural sciences from the schedule in the first cycle of primary education. We can only wonder, as did the Superior Council of Education (1998, 1999), about the reason for this elimination in light of epistemological foundations declared to be constructivist. More serious in terms of the establishment of interdisciplinarity in education is the second problem, the association of the natural sciences with mathematics. Beyond the unfortunate use of the singular to qualify the natural sciences, thus assimilating them to science—which excludes the human and social sciences—and mathematics, a source of a monolithic and dogmatic conception and of a real danger of reification, these two incoherencies, in our view, result from the same lack of understanding of the function of these academic disciplines.

As the program of studies in Belgian Francophone private schools has well shown (Conseil central de l’enseignement maternel et primaire catholique, 1993), the primary *raison d’être* of teaching the natural sciences is to allow students to construct natural reality, as the teaching of humanities is primarily intended for the construction of human and social reality (Lenoir, 1990, 1991). In our view, it would therefore be more appropriate to dissociate the natural sciences—which deal with the construction of natural reality, that is, the environment constituted of relations between natural elements, including living beings, as humans understand them—and mathematics, a basic subject in the sense that De Landsheere (1979) has underscored its primary function as a formal language, namely a tool. The curriculum does not clearly indicate the primordial function of conceptualization and, therefore, of the process of conceptualization, which is related to the natural sciences and humanities and constitutes their specificity as a conceptualization of natural, human, and social reality. While curricular orientations insist on the constructivist perspective, a certain resistance to this perspective can nevertheless be observed in the curriculum, veiling the conceptualization process, as if epistemological realism formed an indelible backdrop or as if the distinction between what must be transmitted and what must be cognitively constructed was not clearly established. More generally speaking, the problem-based approach and the recourse to projects, both favored by the curriculum, are the source of confusion and tend to conceal the existence of various scientific procedures.

This is why it is important to clearly specify the place of and reason for the various academic disciplines in the curricular structure, so as to bring out their specific contributions and potential in terms of complementarity, convergence and interdependence, thereby promoting student integration of learning and

knowledge. By proposing a logical structuring of disciplinary understanding, Phenix (1964) underscores how frequently “the teacher teaches a particular subject or unit within a subject without any reference to its relationships to other components of the curriculum” (p. 3). Such a qualitative leap, which aims to avoid a systematic analysis of programs of study constituting the curriculum of a given level of education, leads to simplistic and deforming operational propositions, which are results (among others) of an excessive generalization of authors marked by their educational background and professional activities. For example, we might read discourse and observe practices—for example, the problem-solving process, the communication process, or the experimental process that function exclusively according to whether the author is a mathematician, linguist, or physician—as “the” universal approach that applies to all programs, all learning, and all situations whether related to education or daily life.

For our part, by referring to certain parameters (the place and function of the various disciplines—their *raison d’être*—their taxonomical structure, subjects of learning or study, learning approaches), we have already proposed (Lenoir, 1990, 1991; Gosselin, Lenoir & Hassani, 2005) to consider the grouping of academic disciplines into four closely interrelated categories, according to three modes of relation to reality and thus forming a curricular structure with interrelated branches:

- A group of disciplines oriented toward the structuring of natural, human, and social reality, thereby prioritizing the development of knowledge, particularly conceptual knowledge, which in no way excludes the acquisition of methodological and technical skills and their related social and intellectual attitudes. These are basic disciplines, since they constitute the indispensable material for all understanding of what is real. They are the disciplines that come under the human and social sciences as well as the natural sciences;
- A group of disciplines oriented toward the expression of reality, thereby prioritizing the development of skill, which in no way excludes the learning of related knowledge and attitudes. These are the basic disciplines, as no expression of constructed reality is possible without them. This is the case for languages and mathematics;
- A group of disciplines oriented toward establishing relationships with reality from different angles, thereby prioritizing the development of attitudes, which in no way excludes the learning of related knowledge (conceptualization) and skills. Among these

are physical education and technology as well as health education, environmental education, citizenship education, etc.;

- A group of artistic disciplines oriented toward the production and expression of reality as well as one’s relationship with this reality.

While this fourth group occupies an important place due to the specificity of its apprehension of reality²⁹ and of the expression of reality that calls on an aesthetic approach to learning, the first three groups share a scientific methodological approach expressed through specific learning procedures, according to the cognitive goals pursued: approaches to conceptualization (what is to be known ...), experimentation (how to verify ...), communication (what to say ..., how to say it ...) and problem solving (how to proceed in order to ...), etc. It is important, in our view, that in order to promote interdisciplinarity in teaching/learning activities, there be a consistency—both horizontal, between the disciplines, and vertical, between the curriculum, the didactic treatment of knowledge and classroom practice.

3. Current Interdisciplinary Practices in Primary Education

It is not enough to examine a curriculum in terms of its interdisciplinary potential. It is essential to consider the interpreted and experienced curriculum (Berman, 1987; Venezky, 1992), that is, teacher discourse pertaining to interdisciplinarity and its implementation in actual practices.

Although a number of contributors to the educational milieu—including educational advisors and university professors—have, since 1970 and particularly in the 1970s and early 1980s, studied the complex question of interdisciplinarity, it has generally been in an “applicationist” (skillologist) and particularly apologetic perspective lacking critical distance (Larose & Lenoir, 1998; Lenoir, 1991; Lenoir, Larose & Geoffroy, 2000). It is only in fact since 1985, with our first research on teacher practices and more specifically on the use of the interdisciplinary approach by primary teachers, that it has been possible to progressively establish a description and better understanding of these interdisciplinary practices.

The results we present stem from empirical research carried out by the first author between 1985 and 2007 and financed by federal granting

²⁹ While the perception of what is real is only a starting point for the construction of reality in the humanities and natural sciences, from which the student will have to break free, this construction will be systematically exploited in the arts.

agencies (Social Sciences and Humanities Research Council or SSHRC) and provincial ones (Fonds québécois de la recherche sur la société et la culture or FQRSC, or its predecessor, the Fonds pour la formation de chercheurs et l'aide à la recherche or FCAR). The results also come from other sources, the first being the aforementioned 1982 report of the Superior Council of Education, the second being the doctoral thesis of Laforest (1989), the four final ones being two master's theses (Bacon, 1996; Lemay, in progress) and two doctoral theses (Geoffroy, 2003; Hasni, 2001). Finally, over 1,600 primary teachers—over 2,000 if we include preservice teachers—were reached over the course of this research.

3.1 Teacher Conceptions and Practices Related to Interdisciplinarity

Interdisciplinarity has been a key word in the North American academic context for a number of years (Lenoir, 1995, 1999) among teachers, administrators, government officials, program designers, and university instructors training preservice teachers. Nevertheless, we have recalled (Lenoir & Sauvé, 1998a, 1998b) numerous studies indicating that this term is invested with very different meanings. This polysemy, sometimes bordering on cacophony, is of little help in circumscribing the term's meaning. The word indubitably suffers from inconsistencies at the source of derivatives and obscurities. This is the case in Quebec, where the concept of interdisciplinarity is given multiple significations that create, at the least, semantic confusion. To this must be added a complex past in which the notion of integration of subjects implicitly advocated an indistinct teaching of academic disciplines, and various ideological discourses and uses (through certain textbooks) subtly legitimizing the social hierarchization of these disciplines, and whose consequences we will examine. It is therefore not surprising that teachers have a blurred vision, conceptually speaking, and that they assert their use of what they describe as interdisciplinary practices, which in fact are, to say the least, dubious in terms of interdisciplinarity.

The research has highlighted a strong constant: the consistency of notions expressed in teacher discourse and in current practices. Although considerable changes can be observed according to the curriculum in effect—that of the 1980s and that of the 2000s—for example, in terms of the professional self-image (Lenoir, 2006), this is not the case when it comes to the conception of interdisciplinarity. Regardless of the foundations and orientations of the curricula, little significant change can be seen on this

subject, aside from one or two exceptions that we will address further on.

Based on results from various research, we have distinguished four predominant approaches to interdisciplinarity among Quebec primary teachers (Figure 1).

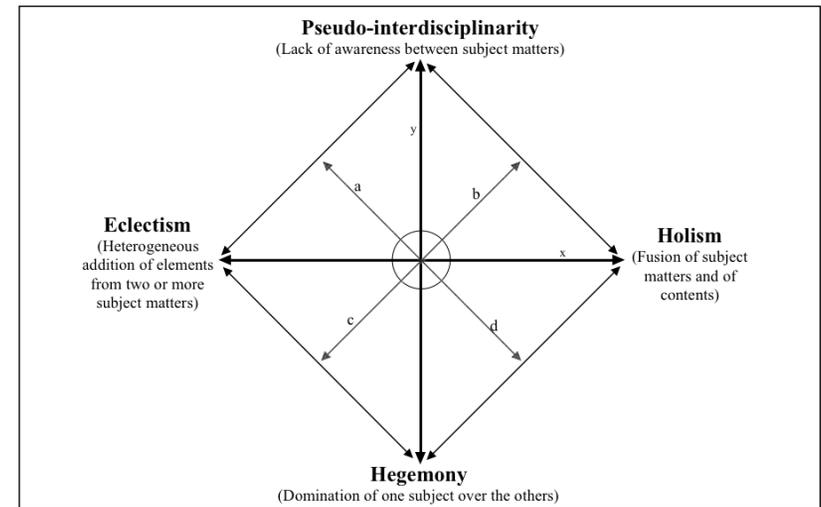


Figure 1. The Poles of Interdisciplinary Practice in Quebec Primary Education.

Placed on a Cartesian axis (x and y), these four dominant approaches make up the extreme poles of two intersecting continua. The x axis (holism-eclecticism) concerns the degree of fusion or dispersion of academic disciplines, while the y axis (hegemony-pseudo-interdisciplinarity) concerns the intensity of relations between academic disciplines, ranging from domination to the absence of real links. The two-sided arrows ac and bd illustrate the fact that interdisciplinary practice can be associated with one approach or can lie somewhere between two approaches. The circle at the center of the diagram represents the interdisciplinary perspective we will discuss.

This typology of current interdisciplinary conceptions and practices (Lenoir, Larose & Geoffroy, 2000) underscores the great confusion in the school milieu regarding this concept—a result of a conceptual superposition of non-complementary and often opposed orientations leading to praxeological disorganization. It appears that teachers feel they are pulled between different options from various sources. Several factors explain primary teachers' reasons for choosing eclectic practices that are not rationally founded on scientific bases: strong social pressure from the discourse of the media,

parents, or administrative authorities in favor of increasing the time and attention given to learning objectives of French and mathematics programs; a lack of understanding of the foundations of teaching curricula and of their operationalization; the inadequacy of disciplinary and interdisciplinary training; epistemological conceptions of knowledge and the acquisition of knowledge, and therefore of its transmission; the weight of pedagogical tradition; a logic of action in a context of urgency and founded on common sense and intuition rather than on a reflective analysis on the task at hand (curriculum, prescription, constraints, etc.) and of practice; etc. The absence of explicit commitment on the part of the MEQ concerning the meaning and implementation of interdisciplinarity is assuredly another problematic factor.

When discussing interdisciplinarity, teachers address only the pedagogical dimension, that of classroom action, in terms of the immediate action they experience and of what they perceive as absolute constraints and urgencies. Their conceptions of interdisciplinarity are reduced to generalities, centered on the idea that it involves several disciplines, rather than on attributes that could characterize the notion and guide their actions. They do not refer to the didactic elements that would enable reflection on relations to knowledge and their place in teaching/learning processes, even less to curricular dimensions nevertheless essential for ensuring the conditions for using interdisciplinarity. Hence, their interdisciplinary practices in the classroom lack an underlying basis and closely mirror their uncertain conceptions. The same observation can be made for preservice teachers, as demonstrated by the results of a recent survey (FQRSC, 2002-2005) of 348 students in the teacher education programs of Quebec's four principal Francophone universities. Other data gathered in various research, including the most recent, through interviews and survey questionnaires, underscore the absence of conceptualization of interdisciplinarity among Quebec primary teachers. Due to a lack of attributes to describe the concept, they are unable to act as guides in the implementation of teaching practices truly involving an interdisciplinary approach.

The results of the various research show that the pseudo-interdisciplinary approach based on the use of themes is especially common among first cycle primary teachers. This tendency is mainly caused by their significant preoccupation with awakening student interest, the relational and psycho-affective dimensions (together with the organizational dimension) taking up a preponderant place in their interventions with students, to the detriment of cognitive dimensions (Lenoir, 2006). On the other hand, the hegemonic approach, in which certain disciplines are in fact no more than a pretext for promoting other disciplines, is especially common among teachers

of the third cycle of primary school. This tendency may be explained by the priority certain teachers give to the teaching of French. The eclectic approach, profoundly destructuring because it perceives learning content as a "pot-pourri"—to use the expression of Jacobs (1989)—in which one can pick at random, can be observed at all primary levels. The holistic approach, for its part, based on the negation of all disciplinary specificity in the name of the existence of a natural approach, is specific to teachers adhering to pedagogical conceptions prevalent in Quebec in the 1970s. These conceptions promote an open and active pedagogy centered on student interest and leading to the suppression of cognitive objectives. As previously noted, the four approaches are also used by teachers whose primary aim is to meet curricular requirements from a strictly administrative point of view. In such a case, these approaches serve mostly as justifications for the absence or near-absence of the teaching of certain academic disciplines, officially mandatory and planned for in program organization, but in fact considered secondary from a social point of view. The teaching of the arts, natural sciences, and humanities is especially concerned (Lenoir, Larose, Grenon & Hasni, 2000).

The discourse on interdisciplinarity (or the integration of subjects) therefore masks practices most often marked by the primacy of certain socially valued disciplines and the dilution of socialized knowledge specific to disciplines said to be "secondary," in favor of gaining time for the teaching of primary disciplines. Moreover, it can be hypothesized that the use of practices said to be interdisciplinary is based on two key preoccupations among teachers: a gain of time and the student interest and motivation resulting from the adoption of thematic approaches or projects. The cognitive contributions ultimately receive little consideration.

Few primary teachers consider that interdisciplinarity in the school, rather than leaning toward one or another of these poles, should be situated at the intersection of the axes formed by these two continua. The reason is to ensure, on the one hand, "a mutual dependence, with neither predominance nor neglect, between academic disciplines according to the pursued instructional goals" (Lenoir & Sauv , 1998*b*, p. 121) and, on the other, "their consideration, in the richness of their complementarities and concrete and inevitable interrelations in terms of their cognitive content and approaches, necessary for constructing human, social and natural reality, to express and interact with this reality" (Lenoir & Sauv , p. 121), whether the adopted perspective is centripetal or centrifugal. In this perspective, interdisciplinarity can in no case become an end in itself. Instead, its aim is the development by learning subjects of integrating cognitive processes

and the cognitive integration of acquired knowledge. “Understood in this way, academic interdisciplinarity can be defined as follows: a networking of two or more disciplines at the curricular, didactic and pedagogical levels and leading to the establishment of links of complementarity and cooperation, of inter-penetrations or reciprocal actions between them (in terms of aims, subjects studied, concepts and notions, learning approaches, technical abilities, etc.), in view of promoting student integration of learning processes and information” (Lenoir & Sauvé, p. 121).

3.2 The Place and Function of Interdisciplinarity

Central to our research work is the twofold question of the place and function of interdisciplinarity as it is understood by primary teachers. This twofold question is related to a theoretical frame based on the sociology of curricula elaborated by the New Sociology of Education in Great Britain (Lenoir, Larose, Grenon, & Hasni, 2000). Significant stratification of academic disciplines can be consistently observed when studying Quebec primary education over the course of the past 25 years. The grouping of academic disciplines into learning areas in the current curriculum hardly changes the equation. This stratification brings about a compartmentalization of education, in the sense suggested by Bernstein (1971, 1975, 1997a, 1997b) and Young (1971). This compartmentalization may in fact be reinforced at the primary level due to the gradual incorporation, for different reasons, of the logic of secondary school education, marked by an increase in the number of “specialists” carrying out interventions with students of one same class and the various classroom teachers teaching certain subjects that had previously been entirely delegated. In addition to leading to parceled education, this stratification leads, among other things, to a devaluation of a number of academic disciplines.

Beyond the definition and characteristics teachers could attribute to interdisciplinarity, it has been approached from different angles, each time implying the development of justifying rationales on the part of teachers: the hierarchical structure of disciplines generally taught at the primary level and depending on the types of knowledge; the distinction between basic and secondary subjects; the average weekly time devoted to the teaching of various disciplines; the complementarity between the disciplines; and the operational modalities favored.

3.2.1 Hierarchization of disciplines taught at the primary level: The

results gathered in our research attest to the consistency of the hierarchical structure that preservice teachers accord to the various academic disciplines constituting the primary school curriculum—whether in the 1980s or of the 2000s (Table 2).

Table 2
Hierarchical Order of Disciplines Taught at the Primary Level
According to Six Studies: Overview

Rank	SCE research (1980-81)	Laforest research (1988-89)	Lenoir research (1990-91)	FCAR research (1992-95)	CRSH research (1995-98)	CRSH research (2001-04)
1	French	French	French	French	French	French
2	Mathematics	Mathematics	Mathematics	Mathematics	Mathematics	Mathematics
3	Physical education	Humanities	Humanities	Humanities	Humanities	Geo., hist., + cit. education
4	Humanities	Natural sciences	Physical education	Natural sciences	Natural sciences	Technology and sciences
5	English	English	Natural sciences	English	English	Phys. + health education
6	(Health education)	Physical education	English	Pers. and soc. ed.	Physical education	English
7	Moral education	Art	Pers. and soc. ed.	Religious education	Pers. and soc. ed.	Plastic arts
8	Natural sciences	Pers. and soc. ed.	Religious education	Moral education	Plastic arts	Dramatic arts
9	Religious education	Moral education	Plastic arts	Plastic arts	Religious ed.	Music
10	(Sex education)	Religious education	Music	Physical education	Music	Moral education
11	Plastic arts		Moral education	Music	Dramatic arts	Dance
12	Music		Dramatic arts	Dramatic arts	Dance	Religious education
13	Dramatic expression		Dance	Dance		
14	Manual activities					
15	Dance					

In one final CRSH study (2004-2007), we once again find a hierarchical structure with three groups of subjects. Over the course of two years, we followed seven experienced teachers belonging to the same school board to study their teaching practices in view of describing and understanding, in close interaction with them, these practices and their underlying rationales. In 2006, in this same research, we distributed a questionnaire to primary teachers belonging to this school board. The established hierarchization of subjects once again corresponds to the previous ones (Table 3).

Table 3
Hierarchical Order of Disciplines Taught at the Primary Level
(Established by teachers, according to the CRSH 2004-2007 research)

Rank	Seven participating teachers	Questionnaire results
1	French	French
2	Mathematics	Mathematics
3	Physical and health education	Geography, history, and citizenship education
4	Technology and sciences	Physical and health education
5	Geography, history, and citizenship education	Technology and sciences
6	English	English
7	Music	Music
8	Plastic arts	Plastic arts
9	Dramatic arts	Dramatic arts
10	Dance	Dance
11	Catholic religious and moral education	Catholic religious and moral education
12	Protestant religious and moral education	Protestant religious and moral education

Significant consistency in the hierarchization of academic disciplines can be observed, as can its current crystallization. As we will see, the differences in the hierarchical classification of academic disciplines are in the intermediary zone between the two major academic disciplines and the less highly considered ones.

French—the native language of instruction—and mathematics always

arrive first in rank. A few displacements of other academic disciplines can be seen, related among other things to the addition or elimination of academic disciplines, if not to their reformulation according to modifications in one of the three curricula that have succeeded one another over the past 25 years. We hypothesize that a number of these displacements result from factors related to data collecting procedures. The survey conducted by Laforest in 1988-1989, for instance, essentially involved teachers in urban settings, especially the greater Montreal area, where religious convictions and social pressure on teachers tend to be weaker than in rural settings. This phenomenon has in fact been identified relatively systematically in the latest Canada-wide surveys on identity and religious practices (Beyer, 1997).

Two cases are especially interesting in that they highlight the weight of collective social conceptions on the hierarchization of disciplines by teachers. The pronounced decline in the importance accorded to religious education is most certainly the result of stronger rejection of the confessionality of the Quebec school system, to such an extent that ultimately, as we have already mentioned, the deconfessionalization of administrative structures was made official in June 1998 with the replacement of confessional school boards (Catholic or Protestant) by linguistically designated ones (Francophone or Anglophone). Moreover, we are currently seeing a much younger generation of primary teachers and can hypothesize that these new teachers adhere less to the Catholic faith or, at least, they consider that religious education should not fall under the prerogative of education in schools. The results show the development of secularism in Quebec society and the increasingly widespread conviction that teaching is incumbent not so much on the school system as on the private sphere of the family and its choices, particularly in the multiethnic and multicultural context of modern-day Quebec. This is clearly affirmed by the majority of preservice teachers when they state that these matters should be learned outside of school, as they have to do with personal choices. This hypothesis also corresponds with the observation made fairly recently by the Catholic committee of the Superior Council of Education (Dubois & Bouchard, 1997), which has since been dissolved, as well as with propositions outlined in the report of the Working Group on the Place of Religion in Schools (Gouvernement du Québec, 1999).

In the case of English, we advance that its place is related to two factors: First, the physical location of responding teachers renders this subject more important in urban and industrialized settings where the presence of English is more visible and judged necessary; second, attitudes of teachers according

to their social, cultural, and economic background, as well as their political convictions, all influence their assessment of the importance of learning what is officially considered to be a second language, according to federal policy, rather than a foreign language.

It is interesting to note that these results at least partly concord with those of a study published in 1995 by the Organisation for Economic Cooperation and Development (OECD) conducted in 12 member countries. Presented in another publication of the OECD (1997), the results of this study show that the native language and mathematics also occupy the first ranks in terms of the importance they are given for ensuring an education. On an evaluative scale of 100, these disciplines respectively obtain averages of 90 and 85. Following are foreign languages (78), technology (72) and science (65), social sciences (60), citizenship education (58), and physical education (55). Technology (50) and the arts (37) come in last.

If we consider only the most recently available results, those of the FQRSC 2002-2005 research on preservice teachers in the four principal Francophone Quebec universities (Laval, Montréal, UQAM, and Sherbrooke), we arrive at essentially the same results.

Four research works (Lenoir 1990-1991, FCAR 1992-1995, CRSH 1995-1998 and Lenoir 2004-2007) have more particularly allowed for questioning primary teachers on their ranking of disciplines according to the contribution of each to the types of knowledge generally designated by vocabulary used in the field of education. The results systematically give special weight to these two same academic disciplines for the development of knowledge and skills. The humanities and natural sciences, whose principal *raison d'être* is the conceptual production of human, social, and natural reality, are nevertheless understood only as means for accessing a relatively unimportant general culture and, above all, from a “techno-instrumental” standpoint. They come only after English. This tendency illustrates the clearly instrumental option characterizing primary instruction and its conception. It is so prevalent that, in the new curriculum implemented at the primary level since 2001, the results of the FQRSC 2002-2005 research demonstrate that the vast majority of preservice teachers welcome the elimination of humanities and natural sciences programs in the first cycle, despite the fact that, as we have remarked, the curriculum is presented as constructivist. Hence, we can only hypothesize that curricula, regardless of their nature, do not influence teacher conceptions regarding the respective importance of academic disciplines. The interpretative factors can be found in the sociocultural dimensions and in the institutional use that is made of these disciplines. This hypothesis is

consistent with the curricular analysis of the New Sociology of Education in Great Britain conducted in the 1970s.

3.2.2 *The distinction between basic and secondary subjects:* The presence of a marked hierarchization of academic disciplines implies that interdisciplinarity is generally reduced to a pretext in view of gaining time to be accorded to the teaching of the two dominant disciplines. The distinction between “basic subjects” and “secondary subjects” (a distinction used in current educational discourse) is an interesting one. Consistently observed over the course of 25 years of research, this distinction has remained very stable. In fact, only French and mathematics are considered basic subjects—with the occasional exception of English (Lenoir research, 1990-1991, and FCAR research, 1992-1995)—and the other disciplines are considered secondary to various degrees. Deeper analysis reveals a large gap between basic and secondary subjects. In addition, secondary subjects can be grouped into two categories that have remained relatively unchanged over the years: disciplines placed in the third to sixth ranks and judged to be more important than the others (English, humanities, the sciences, physical education, music, plastic arts) and a last and utterly neglected category (moral and religious education, dramatic arts, dance).

Essentially the same results are reached in the FQRSC 2002-2005 research involving preservice teachers, as demonstrated in Table 4 (following page). The priority here given to mathematics above French could be due to the insistence on this discipline in initial teacher education.

Moreover, in the CRSH 2004-2007 research in which, over the course of two years, we followed seven experienced teachers belonging to the same school board to study their teaching practices in view of describing and understanding, in close interaction with them, these practices and their underlying rationales, we once again find a hierarchical structure with three groups of disciplines: French and mathematics take the first two places in this hierarchical classification. Following are physical and health education (an academic subject reconfigured with the introduction of health education), sciences and technology, geography, history and citizenship education (a new name for humanities with the addition of citizenship education), music, and English. In the third category are dramatic arts, dance, moral education, and finally, Catholic or Protestant religious education.

It is interesting to examine the arguments put forth by teachers to establish this distinction between basic and secondary subjects. Table 5 (following page) presents them succinctly.

Table 4
Identification of Basic and Secondary Subjects by Preservice Teachers
in the Four Principal Francophone Quebec Universities
(FQRSC 2002-2005 research)

Disciplines	Basic Subjects (percentages)	Secondary Subjects (percentages)
Mathematics	97.0	03.0
French	92.6	07.4
Geography, history and citizenship education	87.1	12.9
Science and technology	81.0	19.0
English	70.9	29.1
Physical and health education	71.6	28.4
Moral education	29.7	70.3
The arts: Plastic arts	15.7	84.3
Religious education	15.4	84.6
The arts: Music	09.7	90.3
The arts: Dramatic arts	06.7	93.3
The arts: Dance	03.4	96.6

Table 5
Arguments Advanced by Teachers To Distinguish
Between Basic and Secondary Subjects

Basic subjects	Secondary subjects
• Are essential to future academic success, fundamental to all knowledge.	• Have to do with general knowledge; pertain to culture and personal development.
• Are essential to education because of their utilitarian dimensions.	• Complement basic subjects.
• Are essential to social success.	• Constitute personal enrichment.

According to primary teachers, basic subjects are above all centered on the

development of cognitive abilities while secondary subjects predominantly seek the development of students' cultural and affective dimensions. In terms of the humanities and natural sciences in particular, teachers display a social conception that is at the least simplistic when it comes to their own place and function in the development of human beings. How, then, is it possible to conceive of the teaching of French and mathematics that is not essentially instrumentalized? And how is it possible to conceive of an education that is not based on realist epistemological conceptions and is not actualized by processes involving the transmission of reified knowledge?

A new dominant argument justifying the hierarchical classification of academic disciplines and their assignment as secondary subjects has emerged in recent years, with the implementation of the current program. Both practitioners and preservice teachers consider that academic disciplines in the last three ranks (dance, Catholic or Protestant religious education) and belonging to the secondary subjects should be addressed either outside of school (by families or religious groups), or within other disciplinary programs as complementary or extracurricular activities.

The distinction made by teachers, and implicitly by administrators and politicians, has far-reaching consequences. Besides the distinction established by De Landsheere (1979), which we recalled earlier, this distinction expresses both a tangible reality and a simplistic vision of education. On the one hand, it is clear that learning the native language and mathematics is essential in everyday life and constitutes a passport for pursuing studies. The answers of both preservice teachers and practitioners amply attest to this fact. On the other hand, however, because for primary teachers basic subjects are above all centered on the development of cognitive abilities while secondary subjects predominantly seek the development of students' cultural and affective dimensions, their conceptions of primary education remain "techno-instrumental," focused on the learning of reading, writing, and counting. Such a conception excludes any possibility of using a rich interdisciplinary approach based on the interrelation between academic disciplines primarily seeking the conceptualization of natural, human, and social reality (the sciences and the natural sciences) and the disciplines seeking the expression of this reality, which are essentially the native language, symbolically speaking, and mathematics, formally speaking.

3.2.3 Average weekly time devoted to the teaching of the various disciplines: When examining the average weekly time devoted to teaching the various disciplines by primary teachers, as research has done up until the last

curricular reform in 2001, one can see that teachers grant to all disciplines an average time inferior to that prescribed by the program organization imposed by MEQ, with the obvious exception of French and mathematics, which alone make up for 60% of average weekly time—that is, 10% more than the allotted time—with a minimum 30% and a maximum 95% of weekly time (Table 6). The factors studied lead us to believe that, with the implementation of the new curriculum in 2001, a significant gap remains between prescribed and actual teaching times. However, certain disciplines such as the natural sciences and humanities may be taught more, but their teaching may remain highly problematic. Among other things, the results show that the current curricular reform reconfiguring the respective contributions of disciplines finds little echo in the discourse of preservice teachers (Lebrun, Lenoir, Araújo-Oliveira, Hasni, Morin, & McConnell, in press).

Table 6
Average Weekly Time Devoted
to the Teaching of the Various Disciplines Before 2001

Disciplines	Minimum % of time	Maximum % of time	Average % of time	Standard deviations	% of time MEQ
French	19.2	55.6	35.3	5.9	30.4
Mathematics	11.4	40.0	24.6	6.2	19.6
Religious education	0.0	12.1	6.8	1.8	8.7
Humanities	1.8	12.2	6.1	2.0	8.7
Physical education	0.0	12.1	5.3	2.0	8.7
Natural sciences	0.0	12.1	4.4	1.7	5.4
Moral education	0.0	10.6	4.3	3.5	8.7
Plastic arts	0.0	9.8	3.9	1.7	4.3
English	0.0	12.2	3.7	3.4	4.3
Music	0.0	9.8	2.7	2.1	4.3
Pers. & soc. development	0.0	16.3	1.9	1.9	—
Dance	0.0	9.5	0.5	1.4	4.3
Dramatic arts	0.0	5.0	0.4	1.1	4.3

As for the reasons advanced to justify the reduction of time devoted to these disciplines, teachers offer various justifications, including the following principal ones:

- It is the school board that determines this distribution of time allotted to each of the programs.
- They are secondary subjects.
- The lack of time for teaching French and mathematics leads to a decrease in time to be devoted to the other disciplines.
- Parents and school boards exert pressure on the decisions.
- There are personal reasons, especially a lack of interest and training.

The first and fourth motives are exterior to the classroom dynamic and beyond the control of the teacher. The second is factual and, as it were, tautological (these disciplines are taught less because they are secondary subjects; because they are secondary subjects, they are taught less). The third is temporal in nature and also lies outside the control of teachers (overburdened programs or slowness of learning), as the responsibility for a reorganization of the schedule apart from that planned for in program organization may be subject to factors related to the mesostructure, to learning objectives, or to learning subjects. Only a little under 5% of the reasons evoked mention the teacher's inaptitude to ensure the teaching of certain programs, which would lead the teacher not to grant them any time. The lack of importance, if not disinterest, teachers accord to these disciplines is not considered. It should be noted that, as an exclusive justification, time accounts for 40% of the reasons given and 27% of the reasons associated with another motive, as demonstrated by the categorization of this variable. This expresses the extent to which time is a primordial variable for primary teachers. Teachers lack time, or at least are convinced that they do, and this may explain the previous search for a solution in the integration of disciplines, and the modern search for a solution in interdisciplinarity.

3.2.4 The complementarity of academic disciplines and promoted approaches for operationalization: In their discourse, teachers favor links between a few academic disciplines, with the exception of those teachers who claim to teach all disciplines simultaneously (holistic perspective), often based on manuals presented as integrating the totality or near totality of academic disciplines (Turcotte & Lenoir, 2001). They primarily cite French, with which they especially associate the humanities and, to a lesser degree, the natural sciences. Mathematics is much less mentioned, and is particularly associated with the natural sciences.

The results also reveal a certain gap between the theoretical options

(choice of disciplines to associate) and practice (references to disciplines cited), which illustrates for example the situation of mathematics, more cited than chosen (this can nevertheless probably be explained by the fact that it is more systematically taught in isolation). It also appears that the choice of subjects in view of their use in a frame of interdisciplinarity or integration of subjects depends on whether the teacher teaches them or not. However, it must also be remembered that society holds the promoted subjects in higher esteem.

The examination of videotaped teaching practices (Lenoir, 2006; Lenoir, Maubant & Routhier, 2008; Maubant, Lenoir, Routhier, Oliveira, Lisée, & Hassani, 2005) highlights three principal modes for establishing relations between disciplinary content.³⁰ The most frequent relation is the thematic one, which falls under a pluridisciplinary approach (pseudo-interdisciplinary perspective). The other modality for complementarization is the use of a discipline in view of promoting another discipline (hegemonic perspective). The teacher may, for example, call on a historical element—a fact, text, conception, etc.—but only as a pretext, as a trigger for introducing a French activity. However, many teachers (up to one-third belonging to one of the school boards in our 2002-2005 research) call on an interdisciplinary approach in their practices by interpreting it as an implementation by students of their life experiences, of knowledge acquired in everyday life. The two approaches thus favored are empirical experimentation and trial and error. Unfamiliar with the 1980s era, these teachers adhere to a conception of cognitive self-structuring which, in practice, leads to a certain *laissez-faire*.

What we wrote in 1992 appears still to be relevant today: “The use of interdisciplinarity or the integration of subjects in the current context would only superficially modify teaching practice for a large portion of primary school teachers. ... The integration of subjects would then become for the teacher an excellent way to maintain hegemonic teaching of French and mathematics while giving the impression of teaching other disciplines, using the latter as material pretexts or even ensuring their strictly minimal teaching” (p. 46).

³⁰ The eclectic perspective remains present, but less so than in the 1980s and 1990s, when teachers had to apply the curriculum based on behavioral objectives. Today, it is found among teachers who continue to teach according to the conceptions of those years, all while generally affirming their agreement with the competency-based approach of the current curriculum.

4. Current Interdisciplinary Practices in Secondary Education: Results of Research on the Justification and Use of the Concept

A recent survey questionnaire given to 89 secondary teachers, 56% of whom teach the first cycle of secondary school (Hasni, Lenoir, Larose, Samson, Bousadra & Dos Santos, 2008), highlights the problem of interdisciplinarity in the context of scientific and technological education. The results show great diversity in justifications for interdisciplinarity advanced by respondents. In addition to statements with synonymous expressions or with definitions of interdisciplinarity, these justifications essentially refer to aspects that are utilitarian, pedagogical-affective, relative to learning and the development of the individual, and organizational.

4.1 Declared Interdisciplinary Practices and the Disciplines Concerned

Two questions concerned stated interdisciplinary practices (Hasni et al., 2008). In the first question, we asked teachers to specify the degree to which their teaching promotes interdisciplinary links, on a scale from 0 (never) to 9 (always). On average, the respondents evaluate their practice at 4.98 (standard deviation: 2.64). It is nevertheless important to point out that roughly half of the respondents teaching sciences and technologies or mathematics rate their practices between 0 and 2: an equivalent percentage of respondents teaching other academic disciplines than sciences and technologies or mathematics rate their practice between 5 and 7. The answers of those teaching both sciences and technologies and mathematics are in the general mean (mostly between 3 and 5).

In the second question, we asked teachers to describe in a few lines two examples of their most significant interdisciplinary practices in teaching situations and to specify the disciplines involved in these situations.³¹ In absolute numbers, the results show that it is especially French (N = 35), the humanities (N = 31), and sciences and technologies (N = 28) that are mentioned in the examples given. They are followed by mathematics (N = 18), arts and music (N = 18), and English (N = 13). Next are disciplines such as moral and religious education (3). Technology (ICT), which did not have a significant place in teacher conceptions of disciplines best suited for interdisciplinarity, is strongly present in the examples describing stated practices.

³¹ This question was answered by 74 teachers. Among the 15 who did not answer, 11 teach sciences and technologies.

When considering the number of respondents teaching each of these disciplines, the order of importance changes. It is the humanities, the arts and French that are most often cited. These examples are followed by English. The sciences and technologies and mathematics have a citation ratio below 1. Apart from certain minor differences, notably those related to the sample (absence of certain answers for the second question), the responses on stated practices largely correspond to those concerning teacher conceptions of disciplines well suited for interdisciplinarity.

Although many respondents who teach sciences and technologies have primarily used other subjects such as French and the humanities in their interdisciplinary practices, the reverse is not true: Only three respondents who do not teach these disciplines cited mathematics in their examples, but never sciences and technologies. The group of respondents teaching mathematics, but not sciences and technologies, rarely used the scientific and technological disciplines in reported examples (only 2 for environmental studies).

4.2 Collaboration Between Teachers

The question of collaboration between academic partners has been explored from two angles (Hasni et al., 2008): that of teacher conceptions on the matter and that of practice (based on described examples). Although most respondents (84.2%) “completely agree” or “mostly agree” that interdisciplinarity implies that two or more teachers plan, teach and evaluate an interdisciplinary scenario together, few call on other partners in their declared practices. Among the 37 teachers who state that the presented interdisciplinary situations involved other partners, 23 teach sciences and/or mathematics. Among the respondents, 17 (including 12 teachers of sciences and/or mathematics) affirm that these situations required the intervention of contributors other than teachers. When this is the case, it is for specific interventions by laboratory technicians (assignment technicians) and, to a lesser extent, school administrations, educational advisors, or invited experts.

4.3 Interdisciplinarity and the Hierarchization of Academic Disciplines in the Secondary School

To explore this dimension, we asked teachers to rate the disciplines of the secondary curriculum according to the importance they attribute to them in students’ education (from the most important discipline to the least important one) (Hasni et al., 2008).

When considering the average rank given by the 75 respondents who carried out this ranking (the others stated that the various disciplines have the same importance), it is French that comes in first (average = 1.52). It is followed by mathematics (average = 2.4), then English (average = 4.36) and physical and sports education (average = 6.26). The scientific disciplines begin to appear as of the sixth position (physics). Biology arrives in 7th position, environmental studies in 9th and introduction to technology in 11th.

When examining these data by considering the sub-sample composed solely of teachers who teach sciences and technologies and/or mathematics (ST, M and STM), the order chosen is globally comparable, with the exception of a few inversions that may be due to the size of the sample: French, mathematics, English, and physical education, respectively come in the top ranks. The scientific disciplines arrive later: biology (5th position), physics (6th position), environmental studies (9th position) and introduction to technology (11th position).

To conclude, the conceptions of secondary teachers cannot be said to closely resemble those of primary teachers. This suggests that these conceptions are above all social in nature.

Conclusion

The curricular analysis and research results we have presented do not make for a flattering portrait of the conception of academic interdisciplinarity and its implementation in the Quebec school system. But this portrait, despite its apparent severity, expresses both a will to adopt this approach and significant shortcomings leading to setbacks, if not failures. It is not enough to brandish the word like a flag to ensure a magical and coherent implementation of interdisciplinarity in the teaching-learning relationship. Moreover, Fazenda (1995) highlights the exceptional increase in actions said to be interdisciplinary and merely based on intuitive practices, on common-sense foundations.

The results show that curricular changes have not had noticeable effects, up until now in any case, on Quebec primary teachers’ conceptions and practices related to interdisciplinarity. Several interrelated factors are responsible for these deficiencies. It is by correcting them that it will become possible to conceive and carry out teaching practices promoting and supporting integrating learning processes and the integration of knowledge by students.

First, the majority of teachers still interpret the curriculum in continuity

with the previous one (Lenoir, 2006), thus legitimizing the preservation of existing practices. Second, despite a policy of government approval essentially limited to pedagogical aspects, textbooks are more concerned about responding to teacher expectations, consistent with an economic rather than educational preoccupation. Hence, textbooks are not primarily conceived to correspond to the foundations and orientations of the curriculum in question.

Third, the high degree of stratification of disciplines globally observed at the primary level in Quebec in no way allows for the adoption of an interdisciplinary perspective. Because the primary school curriculum—and, for that matter, the secondary one—is indubitably compartmentalized, as specified by Bernstein, even if interdisciplinary structures are frequent in the new curriculum promoting a learning area-based approach (Gouvernement du Québec, 2001), the stratification of disciplines is well integrated by primary teachers. Furthermore, as demonstrated by the rationales underlying the distinction between basic and secondary subjects, this stratification of disciplines can be observed by noticeable effects on the distribution of teaching time, on planning and schedules, and on the conception of the teacher's relationship to knowledge.

Fourth, in addition to a serial conception, one can observe a socio-political and sociocultural conception of the academic disciplines favoring the preservation of strong disciplinary structuring and the promotion of instrumental learning, considered to guarantee academic—and social—success. While the research results show the existence of a relation to knowledge underlying the serial and compartmentalized conception of academic disciplines based on a realist epistemological conception, one must also acknowledge the undeniable relation to power that strongly influences teacher conduct. A number of studies show that teachers model their teaching actions on the perceived implicit or explicit expectations—whether real or imagined—of their social milieu, including their school administration, school officials, or parents. The 1982 document of the Superior Council of Education already stated that teachers only have requirements concerning the teaching of French and mathematics and largely ignore the educational function of secondary subjects. “For them, the rest of the academic program consists of mere hors-d’œuvres” (p. 13). It is therefore not surprising to observe, since at least the 1980s, public, popular, and governmental discourse primarily promoting “back to basics” and then, as of 1995, centering on basic learning. This “essential” and “core learning” is in fact no more, at the primary level, than learning to read, write, and count. The

acquisition of these abilities in view of producing “human capital” is today associated with a type of socialization understood as a process of social integration leading to the respect of the values and codes “of group living and citizenship” (Gouvernement du Québec, 1997, p. 47). We see excessive promotion of socialization at the expense of cognitive learning, as the CRSH 2001-2004 and current CRSH 2004-2007 research explicitly bring to light. Thus, the utilitarian perspective combined with an educational approach centered on affective and pedagogical dimensions leaves little room for the development of cultural dimensions among young Quebecers, despite the fact that a strong emphasis on culture is one of the pillars of the Quebec school system reform. In short, the instrumentalist vision projected by the social milieu (the relation to the world) may be associated with a reified vision of teaching content (the relation to knowledge) integrated by teachers and supported by a therapeutic type of socialization (Lenoir, 2009).

Fifth, another factor helps to explain the difficulty of primary teachers to employ more adequate interdisciplinary practices, namely the absence of real interdisciplinary training in university faculties, which in Quebec offer all accredited education, both initial and ongoing. Strong resistance from universities—usually disciplinary specialists—to studying this question and substantially changing training programs, and hence teaching modes, leads to the preservation, despite some significant reorganization over the past decade, of compartmentalization between courses and between these courses and the other components of the curriculum (practicums, etc.). The observed incomprehension of interdisciplinarity in initial teacher education as in the school milieu raises serious questions about both initial and ongoing teacher education in a perspective of intervention requiring both solid disciplinary bases and professional competencies (organizational, relational, etc.) in view of conceiving and implementing teaching/learning situations to support the crossing and interrelation of cognitive content from various sources. In the current state of teacher education, the reflection on interdisciplinarity in Quebec, beyond apologetic discourse and policy statements, beyond ministerial prescriptions, is still in its infancy. It is all but impossible to predict what the state of things will be in 20 years.

Finally, sixth, we have already mentioned that the absence of epistemological and conceptual commitment on the part of the MEQ regarding interdisciplinarity, especially in the curriculum, leaves the door open for any interpretation of interdisciplinarity. If a certain freedom of thought and action is granted, it should nevertheless be guided by

orientations and principles. Agitation and action should not be confused; the former is based neither on rationality and critical and distanced reflection, nor on an explicit aim to pursue. Interdisciplinarity must be subject to a conceptualization ensuring—both vertically in terms of curriculum, didactics and pedagogy, and horizontally in terms of academic disciplines—the establishment of teaching/learning processes, thereby allowing for the integration of knowledge and thought modes, so as to construct human, social and natural reality, to express it and establish relations with others and the world.

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