

INTERDISCIPLINARITY AND RESEARCH ON LOCAL ISSUES IN SCHOOLS: Policies and Experiences from Colombia¹

by

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Abstract: This article examines education policy on curricular integration and interdisciplinary practices in primary and secondary education (K-11) in Colombia. It presents an overview of institutional and teachers' discourses and practices concerning this subject, based on empirical work that was done in Bogotá. Finally, it presents a cooperative research project undertaken by 16 schools and a university that aimed to transform the curriculum with interdisciplinary projects focused on local issues. The conclusion reached is that, despite the complexity inherent in these kinds of projects, it is possible to mobilize people and use knowledge to transform the school, giving it new meaning and enriching its ties to its surroundings and the world.

Key words: Interdisciplinarity in schools, education policy, school knowledge, project method, university, school cooperation, Colombia.

¹ This text presents some of the results of a process that began in 1999 with a review of interdisciplinary practices and curriculum literature, followed by an international conference and a series of cooperative research projects pursued jointly by the National University of Colombia's RED Program and public schools in different parts of the country. Many people participated in this process, in particular José Gregorio Rodríguez (main researcher), Carlos Miñana, and Martha Orozco (National University professors, co-researchers); administrators, teachers, and students from 16 schools located in Bogotá, Ibagué, Villavicencio, Barranquilla, Baranoa, Galapa, and Soledad; and some students from different programs at the National University.

Introduction

This study examines educational policies on curricular integration and interdisciplinary practices at primary and secondary levels in Colombia going back to the 1970s, their impact on pedagogical practices, the theoretical perspectives that substantiate them, and the institutions that have endorsed them. It concludes that, despite the influence of important interdisciplinary projects and initiatives that were pursued in Europe and the United States in the 1960s and by UNESCO and the OECD in the 1970s, in Colombia these initiatives only met with a tepid response in terms of policies, and they never consolidated as school practices. Only as of 1994 were some crosscutting projects promoted, particularly concerning environmental education.

Second, it presents an overview of institutional and teachers' practices and discourses on the subject, based on empirical work done with 208 public and private schools in the capital during 1999 and 2000. It identifies the most common themes in the interdisciplinary and crosscutting projects, the organizational structures employed, the concepts that substantiate them, the way that different agents from the school community participate, the objectives sought, the strategies used, and the pedagogical achievements that are attributed to these projects.

Finally, it presents the experience of a collaborative school-university research project that began in the year 2000 with 16 schools in different parts of the country, with the aim of transforming the curriculum with interdisciplinary projects based on local environmental or urban issues (e.g., transportation, demographics and identity, urban planning, environmental risks). The study addresses the process, the transformation of "school knowledge,"² school organization and pedagogical strategies, the relation between the school and its environment, the empowering of students and teachers, and the impact of these projects for building citizenship and teacher education.

It concludes that, despite the complexity that these kinds of projects entail,

² Young (1971) argued, with reference to Bernstein, "Those in positions of power will attempt to define what is to be taken as knowledge, how accessible to different groups any knowledge is, and what are the accepted relationships between different knowledge areas, and between those who have access to them and make them available" (p. 52). We use "school knowledge" to mean knowledge in schools: all kinds of knowledge that have been legitimated as knowledge that is learned at school (it includes school subjects, vocational learning, and hidden curriculum).

in the end they mobilize people and use school knowledge to transform the school, giving it new meaning and enriching its ties to its environment and the world.

1. Policies on Interdisciplinarity in Colombian Education

For over a century, education in Colombia was framed within the context of the 1886 Constitution and was characterized by a centralized curriculum, based on the supposition of a unified vision of national culture, one official language, and an official religion, the Catholic religion. In this context, for many years the curriculum at most schools aimed to contribute to the moral education of citizens, although it was clearly dissociated, mechanically memorized through repetition, lacked sense, and was distanced from local issues (Reichel-Dolmatoff, 1961).

Nonetheless, in brief periods of Liberal Party rule during the first half of the 20th century, and from the start of that century at some exclusive private schools, interesting experiments were pursued that sought to make school subjects more relevant and coherent, and to integrate content, influenced by the European new-education or active school movement (especially Ovide Decroly who visited Colombia), and Dewey's progressivism (Sáenz, Saldarriaga & Ospina, 1997). To a certain degree, in Colombia these pedagogical ideas motivated integration at the primary school level. Integrated curriculum has carried through to the current day, although this has not been examined in terms of policy or from an academic standpoint.

During the Cold War, and as the result of the new policies toward Latin America by the United States (Alliance for Progress, initiated in 1961), European countries (France and Germany) and UNESCO lost their hegemony to influence education policies in Colombia. In the late 1970s the United States pushed to make significant changes to Colombian education through "curricular renovation," influenced by behavioral psychology and what was known as "educational technology" (programmed instruction). It was not long until academia and the budding teachers' movement reacted strongly to this policy (Miñana, 2002).

In 1991, the new Constitution of Colombia, the result of political recognition granted to demobilized groups and the past 20 years of the struggle by the indigenous movement, acknowledged the country's ethnic, cultural, linguistic, and religious diversity with over 60 indigenous peoples who represent 3.4% of the population (Departamento Administrativo

Nacional de Estadística, 2005). In this new constitutional atmosphere, the teachers' movement and their unions proposed the General Law on Education (Colombia Ministry of Education, 1994a). The law groups school subjects into nine "curricular areas" according to clear criteria and with a certain interdisciplinary perspective on similar academic disciplines (for example, the integration of humanities, social sciences, and science in general).³ To adapt the curriculum to the new legal context, in the mid-1990s the Ministry of Education developed curricular guidelines for each area that reflected the Constitution's new democratic and pluralist spirit. The guidelines were drawn up with the participation of a wide-ranging group of experts, the teachers' unions and their associations; and these embraced a strongly interdisciplinary perspective within each of the curricular areas, although not between them. Despite this, the interdisciplinary perspective did not make explicit reference to conceptual sources. Decree 1860 of 1994 specifies the regulations for the general law, making a series of subjects obligatory, for example environmental and sexual education, stating that these should be addressed not as separate subjects but rather as crosscutting issues (Colombia Ministry of Education, 1994b). The environmental education projects (PRAE) were promptly regulated with an interdisciplinary approach (Colombia Ministry of Education, 1994c): "The environmental education must take into account the principles of multiculturalism, values education, regionalization, interdisciplinarity, participation and education for democracy, management and problem solving" (Art. 2). This is the only field in which there has been an explicit policy about interdisciplinarity from the Ministry of National Education, and it has been supported for years (Torres Carrasco, 2002).

Nonetheless, the neoliberal policies that the different governments adopted as a parallel agenda during the late 1980s shifted the curricular debate away from the guidelines that were meant to orient pedagogical practices toward curricular control using standardized testing, first by sampling and then with the entire population, as of the late 1990s (Colombia Ministry of Education, 1994a).

For the first time, the new 1991 Constitution established the right to education up to the age of 14, leading to pressure for universal secondary education to ninth grade, with the possibility of eventually incorporating

³ Despite progress toward integration, these curricular areas continue to focus on some hegemonic disciplines within each area (for example, the social sciences favor geography and history, leaving out anthropology, sociology, political science, economics...).

grades 10 and 11, and preschool education, an option that had hitherto been the exclusive domain of the middle and upper classes.⁴ Despite the fact that efforts were made to diversify grades 10 and 11 in the 1980s, as the result of the neoliberal policies, it has become a sort of general education in which the student has few options to choose. This is to say that the interdisciplinarity that characterizes much of the North American education system has not existed in Colombia. Interdisciplinary studies were never promoted at the primary, secondary, or middle school levels, nor even at the universities until very recently.⁵

The report by the Science, Education and Development Mission *Colombia al filo de la oportunidad* (Misión Ciencia Educación y Desarrollo, 1994), produced by the country's most renowned academics, refers to the "non-existence of an integrated curriculum that stimulates creativity and foments learning skills, which currently contributes to the low level of education" (p. 24). Along the same line, it states "much of the current education system is characterized by teaching that is dissociated, unquestioning, outdated, and inadequate, that does not enable conceptual integration, which dampens students' curiosity and does not develop cognitive structures." In its recommendations, the mission states "Integrate curricular processes around a few nuclei, such as communication, thinking, and relations to nature and society" (Misión Ciencia Educación y Desarrollo, p. 96). In effect, environmental education is the only field in which it may be seen that a concrete official stance was adopted on interdisciplinarity.

⁴ The General Education Law (1994) established the aims, objectives, and general organization of the national education system. Compulsory education lasts for nine years. Basic primary education lasts for five years, preceded by one year of preschool education. The secondary school system covers six years divided into two cycles: the basic cycle (compulsory) covers four years and the middle secondary cycle two years. Students must pass an entrance examination/test for access to universities. More than 75 percent of all teachers had completed university studies (see Posada Escobar, 2006, about interdisciplinarity in teacher education in Colombia). The Ministry of Education recently has formulated the curriculum in terms of competencies and standards. The Colombian educational system is very centralized although the Ministry delegates the management and operational aspects to Regional Secretariats, big city authorities, and schools.

⁵ One exception in the university milieu is the outstanding initiative by Father Alfonso Borrero (1989), rector of the Pontific Javeriana University of Bogotá, who brought the international debate on interdisciplinarity to Colombia in the mid-1970s, when he created the Graduate Faculty for Interdisciplinary Studies.

In the capital city of Bogotá, which has enjoyed a certain amount of self-reliance and autonomy from the national education system, as of the late 1970s several initiatives were put forth by the municipal government's Directorate for Education Research—Experimental Pilot Center (DIE-CEP), although these proposals did not translate into teaching practices and there was no continuity.⁶ In the late 1990s, at the initiative of Jesuit mathematician Carlos Eduardo Vasco, a renowned academic who studied at Harvard and a member of the commission of advisers to the Science, Education and Development Mission, a pilot project was undertaken for three years with 12 public schools in Bogotá, the results of which were published in a book (Vasco, Bermúdez, Escobedo, Negret & León, 2001). The initiative was based on the Harvard integrated science projects. Without a doubt, this was the most comprehensive interdisciplinary curriculum experience published in Colombia in the 20th century. More recently, and given the crisis and problems that besiege the universalization of secondary education, Bogotá's Education Secretary has proposed changes to the curriculum to prevent dissociation and lack of meaning in school subjects, so as to better serve new population groups that have traditionally been excluded and that are now attending school. This proposal grouped the nine areas from the General Education Law into four “fields of thought”: history; mathematics; science and technology; and communication, art, and expression. The proposal is aimed at “defining as its priority, learning as the process of constant reflection on the cognitive experience, rather than focusing on the sequential organization of information separated by disciplines” (Secretaría de Educación de Bogotá, 2007, p. 13). The subsequent municipal administration aborted the project in 2008, just as it was to progress from the design of the proposal to implementation in practice, despite the fact that the same party and the same education leaders remained in power.

In summary, national and municipal policies have not seriously addressed the issue of interdisciplinarity and the integration of school subjects and knowledge. On the occasions that this has been attempted, the

⁶ Under the influence of UNESCO and OECD, proposals were developed that insisted on the ties between interdisciplinarity and innovation (OECD, 1974). In the late 1970s some interdisciplinary education units were designed and distributed as teaching aids. Subsequently, in the late 1980s, a group known as Secondary Curriculum—with the participation of Carlos Miñana—that had embraced the interdisciplinarity discourses, designed workshops for teachers and produced some working papers.

efforts have been limited to documents drawn up by experts and proposals that never made it to the classrooms in a systematic or widespread way. As has already been documented in the English-language academic literature, these proposals have failed because they did not take into account the organizational and administrative changes that would be necessary to put interdisciplinary practices into effect in the schools (Lake, 1994; Mathison & Freeman, 1998).

In terms of academic publications and debate on these policies, the indicator used is the Colombian teachers' union's journal, which has been very responsive to the policies as well as to the proposals for innovation (*Educación y Cultura*, published by the Colombian Federation of Educators, FECODE). This journal reports on experiences and publishes articles written by teachers and academics and has been in print without interruption from 1984 to date (85 issues). A search for the term “interdisciplinary curriculum” produced practically no results. The subject is not even listed in the index to the first 20 years of publication (2005), nor are similar descriptors such as “crosscutting” found (see a more detailed analysis on interdisciplinarity in this journal in Miñana, 2002, pp. 40–41). This is further evidence of the lack of attention that has been paid to this issue in the debates on pedagogy and education policy.

2. Discourses and Practices

With respect to the above policies, what has been happening at the schools? To answer this question, the RED Program at the National University of Colombia pursued research in 1999 and 2000 on interdisciplinary discourses and practices and curriculum in Bogotá schools (Miñana, 2002). The information produced was based on an exhaustive questionnaire that was administered to a representative sampling of 208 public and private schools, and qualitative fieldwork with 21 of these where the questionnaire or another source indicated a significant experience or innovation of an interdisciplinary nature.

The 208 schools reported 192 interdisciplinary projects: an average of less than one project per school. This figure is very low, considering that by law they should be pursuing several crosscutting projects of an interdisciplinary nature (Table 1).

Table 1
Project Topics

Item	Topic	Number	%
1	Environment	69	35.9
2	Citizenship	40	20.8
3	Values	26	13.5
4	Cognition	18	9.4
5	Interdisciplinary	10	5.2
6	Urban issues	6	3.1
7	Others	23	12.0
Total		192	100.0

The schools most frequently reported environmental projects (35.9%), no doubt because of the obligatory requirement under Decrees 1860 and 1743 of 1994 (Colombia Ministry of Education, 1994a, 1994b). In the environmental projects, frequently mention is made of interdisciplinarity. This could be due to the Ministry of Education guidelines, reiterated at conferences and events, plus the fact that in international policy and environmental education it is a recurring theme. The teachers are aware of the need to work with this perspective, but in every case it is the natural sciences area that takes not only the lead but also entire responsibility for the project.

Interdisciplinary projects at exclusive private schools reflect academic concerns that are addressed through broad-based, flexible proposals that incorporate the teachers' initiatives with the support of school administrators. In contrast, at the public schools where exam results are poor because of a lack of cultural capital, concern for the students' cognitive development has resulted in efforts aimed at resolving specific cognitive problems such as reading, writing, or mathematics in classroom projects, "reinforcement" and instrumental activities done by individuals or small groups of teachers, and not as institutional policy.

Interdisciplinary projects at the primary school level are usually not interdisciplinary, but rather integrated or global. The primary level is conducive to presenting pedagogical work through projects (Kilpatrick, 1918). In fact, it is at this level where the teachers work on the different areas together, whereas at the secondary school level the approach by discipline is more common.

Our Colombian fieldwork uncovered three motives for starting inter-

disciplinary projects: a) as a campaign to solve a problem or respond to a government or NGO initiative; b) under pressure to fulfill the legal requirement; and c) at the initiative of a teacher or group of teachers who, oftentimes, were pursuing a graduate degree or taking a course, and as part of this they were required to implement a project at their school.

Interdisciplinary approaches in projects or innovations arise as a pedagogical tool, not so much because of the subject matter, nor as an epistemological or curricular requisite, but rather at the initiative of different teachers (or even a single teacher), as something personal that is limited to the interest and availability of the teachers. This results in a sort of subsidiary interdisciplinary approach wherein one discipline is placed at the service of another, in which some teachers "collaborate" with others. This is not an interdisciplinary approach applied to the solution of complex problems by means of incorporating different disciplines, but rather projects with kaleidoscopic characteristics in which each subject seeks to participate by contributing its part. The leading subject areas for these interdisciplinary practices are the areas of biology, Spanish, and social sciences.

Addressing issues with an interdisciplinary approach is motivating for the teachers in that it requires them to research constantly, exposes them to new ideas, and provides a break from routine. It leads to different relations with other teachers and with their knowledge and methodologies. Working from an interdisciplinary perspective is perceived as something complex and "far reaching" that requires a long-term process. Paradoxically, in general the projects are short-term, of specific and delimited scope and timeframe. But in some cases these have become institutional or incorporated into the school's organizational structure, either by allocating some weekly time or by definitively regrouping the subject areas in broader academic and work units.

Some students perceive the experience of working with an interdisciplinary approach as positive because it broadens the perspective, introduces new and diverse materials, enables them to draw ties between different subjects, and sparks greater activity and motivation on their part.

In the school context, specifically at the secondary school levels, interdisciplinary practices and teamwork are practically synonymous. It is not surprising that the first significant interdisciplinary experience in the history of education was the result of efforts to teach as a team (Marín Ibáñez, 1979). Fieldwork revealed, first, that the way schools are currently organized is not geared toward dynamics for collective work or conducive to teamwork. Aside from a couple of exceptions—particularly seen at

exclusive private schools whose philosophy directly addresses this point—the tentative efforts in this sense are the result of struggling against the tide, and the leadership of individual teachers, which does not always work out well. Except for the above-mentioned cases, the principal and academic coordinators at least provide locations and set aside time to hold meetings during school hours, but they do not consider this work as one of their fundamental tasks at the school, and occasionally they act as obstacles to the implementation of the projects.

The students appear as the direct beneficiaries of the projects. They participate in the activities that the teachers design, but often they are not aware of the meaning, intent, or work style. Supposing that a project of this type would need a time budget of at least four hours per week on average to make an educational impression on the students, then only 9.5% of the schools meet this requisite. Sometimes participation is assigned as “forced labor” or as a punishment, with all of the negative implications that this entails. In other contexts it is a stimulus. Participation is done as part of a group—work groups and, above all, ecological committees that have little autonomy and that wind up being used by the teachers for specific short-term projects. Very consolidated and structured work plans were also observed.

The parents and other members of the school’s community are largely missing from the projects, or else their participation is limited to occasional activism and fund-raising events.

One of the initial hypotheses of the research suggested that the interdisciplinary projects would affect and transform the style of school administration and organization. However, in most of the projects we did not find evidence of significant changes in this sense. The projects had no fundamental impact, and everything remained as it had been. Not even a timeslot or organizational structure was allocated, but rather the work was pursued during stolen moments and after the school day. The school day was not at the service of the projects, but rather these had to work around a schedule that was drawn up with more administrative than pedagogical criteria.

The strategy that the teachers used most often for interdisciplinary projects is to select broad topics or issues for which it is possible to relate activities from all of the disciplines involved. Nonetheless, the topics often do not have enough scope to make it possible to study them in the medium- and long-term from the perspective of the different disciplines (see Miñana, 2009, about teaching practices in Colombia).

At the same time, seldom do the topics arise from the interests and needs of the students. It was observed that their non-participation in the selection of the topic notably affected their performance and, of course, their motivation.

The most significant changes that these projects brought about were in terms of attitude, rather than cognitive-academic changes. Only 10.1% of the answers on the questionnaire mentioned changes in terms of specific skills and learning gained, and only 2.2% referred to changes in the academic school culture or the students.

The experiences observed in Bogotá at the start of this millennium, especially at the public schools, have been affected, to their detriment, by education policies that have increased pupil-teacher ratios, reducing the time teachers have to meet and prepare activities together (Miñana, 2008). They have concentrated on the results of standardized testing done with paper and pencils, have reorganized (reengineered) the institutions to reduce the number of administrators and support staff, and have worsened working conditions and salaries for teachers (Álvarez, Mestizo, & Miñana, 2005; Suescún, Miñana, Arango, Hernández, Bernal & Ortiz, 2005; Téllez, Beltrán & Miñana, 2005). At the present time, public schools have lost autonomy and they are responding obediently to the demands and requirements of the regional and national administrations that are concerned about showing immediate “results” to the electors (Miñana & Arango, in press). A large percentage of teachers are unmotivated because of poor wages and discouraged by years of repression of union activism and protests. Colombia is currently experiencing the sort of tension that was seen in North America in the 1990s, when efforts were made to reconcile two apparently contradictory tendencies: increase in emphasis on experiences with comprehensive approaches and the pressure on the students to perform on standardized tests that, most of the time, take their indicators from the academic disciplines.⁷

3. Interdisciplinary Research on Local Issues: A School-University Collaborative Experience

Given this situation, and with the National University’s potential to orchestrate a collaborative project between the school and the university, in 1999 the team at the RED Program developed a proposal called Interdisciplinary Curricular Projects (ICP). These sought to establish ties

⁷ Mathison (1998) proposes another perspective and maintains that the U.S. standards encourage ties between academic disciplines.

between the academic disciplines, school subjects, and the daily issues of the school and its environment from a complex perspective, producing joint knowledge about their problems, and also contributing to solving these. The ICP did not purport to solve all of the school's problems, nor to serve as comprehensive solutions without gaps. Rather these were open-ended proposals for working at the schools, centered on the curriculum, and in which the teachers, administrators, students, and parents could participate voluntarily in differing degrees. This is not a model or methodology to be replicated or multiplied at each school. To the contrary, its richness lies in its proposal to be a structure and principle for association and working together, within which the groups of teachers at the schools may come up with their own questions, develop their own proposals, and seek relevant answers to the social problems faced by their communities and in pursuit of the education of the students.

The ICP proposal is based on an overview (Miñana, 2002) of the body of interdisciplinary experiences at the schools and the research of the Anglophone (Darling-Hammond, 1992; Goodson, 1995; Jacobs, 1989; Lake, 1994; Stenhouse, 1970), Francophone (Apostel et al., 1972; Lenoir, 1999; Lenoir & Geoffroy, 2000; Lenoir & Larose, 1998; Lenoir, Larose & Dirand, 2000), Hispanic (Torres Santomé, 1994; Zabala, 1999), and Colombian publications (Borrero Cabal, 1989; Vasco, Bermúdez, Escobedo, Negret & León, 2001), and the initiatives of international agencies (UNESCO, OECD).

From a research point of view, the ICP endeavor to link three dimensions:

- Research on local and community issues is pursued jointly by the school and the university, with the objective of changing teaching practices, linking “school knowledge” (Young, 1971) with new kinds of knowledge (local, experience-based, and universal) and fomenting experiences that give new meaning to the school and to learning for life by the students and teachers.
- The pedagogical research is inspired by two fundamental principles: one, considering pedagogy as a reconstructive discipline (Mockus, Hernández, Granés, Charum & Castro, 1995) that arises from reflection on practices (action research) that seek meaning in pedagogical theory; and two, considering teachers as transformative intellectuals (Giroux, 1997) and not merely as reproducers.

- The education research by the university professors has the objective of identifying the processes and results obtained at the participating schools. This is understood from a dual perspective: It produces knowledge about the education and, at the same time, it educates the participants (Pérez-Gómez, 1995). The “objects” of investigation construed in this dimension pertain not only to the pedagogical practices, the school environment, and its internal transformations, but also to the links between the school and its local and institutional contexts (Acevedo, Jurado, Miñana & Rodríguez, 1998).

The ICP were pursued between the years 2000 and 2006, with the active participation of 16 primary and secondary schools in Bogotá, the Atlantic coast, Ibagué, and Villavicencio. The National University's RED Program addressed a) the conditions for incorporating the dynamics of interdisciplinary research on the context and local knowledge into the curriculum and pedagogical practices, b) the processes followed in these experiences, c) the changes in academic culture, curricular management, and school organization, and d) the impact that this pedagogical research had on transforming the relation of the school with different kinds of knowledge and with its environment.

In order to present the experience, three different stages have been established. These were not defined beforehand but rather were moments that arose as the process unfolded at each institution. The first stage concerns the creation of interdisciplinary teams and the definition and development of projects at the schools. The second presents the unfolding of the projects and the pedagogical innovations. The third stage aims to show some results concerning knowledge and innovation.

3.1 Creation of Interdisciplinary Teams and Definition of ICP

Although the ICP consider the school-university relation as one of collaboration framed within the logic of research practices, this relation, as such, had to be built with the schools. The first stage of collaboration was a process of negotiation in which the parties expressly state their intentions and interests and reach consensus.

The university team prepared a research proposal that it presented to the administrators and teachers. This proposal was characterized by incorporating research on local issues and knowledge into the curriculum

and pedagogical practices on two main topics: environmental education and urban studies. Each school, according to the interests of its participants, decided on which topic it would pursue.

Once the topic had been defined and the teachers who were interested in participating at each school were registered, a preliminary process created the research teams and selected the grades and groups of students with whom the project would be implemented. The second process defined the research problem in the local context. The third process was to structure a procedure so that the project would tie in with the curricular plans at the respective grade levels, with the evaluation indicators, and with the teaching practices.

The definition of the project was not considered as something separate from the curricular process and the classroom practices. It was understood as part of the planning process for the school, for each participating teacher, and as a collective exercise that would take place in the classroom and beyond, which meant developing the project together with the students. The idea was not for the university to tell the teachers what interdisciplinary practices, curriculum, and research are or should be. To the contrary, the idea was to infuse these three concepts with meaning based on daily practices that little by little began to take shape. It was this particular approach that the schools found confusing during this first stage of the project, because of the expectations that the schools traditionally have of established pedagogical models. The university responded with a constant process of feedback and deconstruction-reconstruction of the proposals for collective research in the schools.

There were two kinds of obstacles to the creation of the interdisciplinary teams, institutional and group dynamics, as the participants cited:

Many pedagogical obstacles still exist that are a structural part of the Colombian education system, such as inflexible classroom hours that must be spent “teaching” classes ... In this aspect, the research group’s ability to work together is laudable, it is a challenging situation, in that the school does not contemplate this practice, as that of dutifully attending meetings and making decisions. Working together is even more difficult, when teachers from the fields of mathematics, art, social sciences, and Spanish are sitting at the same table, a situation that forces the researchers to adopt new ways of decision-making with consideration for others. (Dolores María Ucrós School, Soledad, Research Report, 2007)

These obstacles were surmounted through the definition of the research issues that each group developed with the students and the different tasks that the participants pursued both in the research and in the interdisciplinary curricular experience. In environmental education, the issues revolved around pollution and natural resources: for example “Socio-environmental Study of Solid Wastes,” “Water: A Vital Issue for Everyone,” and “Water: Vital Importance for Community Development.” In urban studies the projects focused on cultural identity or city planning: “Influence of Migration in Building Cultural Identity in the Inhabitants of Soledad,” “Living in the City of Barranquilla,”⁸ “How Has Cultural Diversity Developed in Ibagué over the past 50 years?” “Building the Villavicencio That We Want,” “Who are the Bogotanos?” “Transportation in the City of Barranquilla,” and “Industry in Locale 16 of Bogotá” (The school that undertook the last project also participated in the pilot experience led by Professor Carlos E. Vasco).

A fundamental element for catalyzing team-building and the start of the processes for research and innovation was to include the children in identifying the problems and developing the projects, a process that enabled the teachers to take into account the students as individuals with knowledge (local knowledge and knowledge deriving from experience), and with whom it is possible to dialogue and interact as coauthors in the experiences:

First an activity was held with the two groups of children from sixth grade, which consisted of having the children and teachers identify in drawings their visions of the city. During this activity the children were also asked to recount how they felt during this exercise. This resulted in a wide variety of answers that read as a whole make it possible to deduce, among other conclusions, that the children have informal knowledge of the city, acquired through daily life and that they furthermore want to study the city. Both the teachers and the students questioned many things that were taken for granted in their images of the city and concerning themselves. The children and adults were able to enter into a genuine relation of dialogue and interaction. They want a city where public services can be enjoyed; they are concerned about the well-being of the city, they dream of a happy

⁸ This project initially focused on the different elements that affect life in Barranquilla with special attention paid to a recurrent element: the periodic flooding of the streams that overflow into the city’s streets, causing problems (See <http://www.arroyosdebarranquilla.org/>. This website, which was one of the project’s products, has won several awards).

city, with parks, clean streets, and nice houses. Subsequently the group did a second set of drawings that made it possible to propose a more complex taxonomy for addressing the city as an object of study, which included the categories of structure, function, population groups, indicators of problems, and the subsystems of nature, society, and culture. This task made it possible to give the project a name, based on one of the exercises that the children did: “Building the Villavicencio That We Want.” (Luis López de Mesa School, 2007)

3.2 Developing Interdisciplinary Curricular Projects: Pedagogical Innovations

The interdisciplinary curricular projects entered their second stage when the organization of the team and the teamwork process made it possible for the groups to meet regularly for the permanent study and planning of pedagogical processes from a perspective of researching the local environment.

The second stage was characterized by cooperative work between the schools and the university (Bartolomé Pina, 1986) in which three kinds of differentiated objectives were established for the urban education projects. The first objective was that of research on the cities, in which the aim was to develop knowledge of the historical and structural aspects of the cities, identifying economic, political, social, and geographic factors. A second objective, in terms of learning, aimed to help the children and young people develop their skills: a) to analyze different aspects of their environment, using the categories from the school context, establishing relations between “school knowledge” and experience-based knowledge; b) to link the knowledge from different disciplines so as to understand local phenomena from a comprehensive perspective; and c) to use scientific categories to research aspects of the environment and seek solutions to the problems. This objective aimed to incorporate the logic of the research in the pedagogical processes with the students: formulating problems, documenting them theoretically, designing processes for gathering information, gathering it, building, analyzing, and interpreting information. The third objective was related to the production of pedagogical knowledge by the teachers, so as to document the curricular and pedagogical shift that resulted from the project, by examining how the students appropriated the projects. These three objectives made it possible to link the research processes on the local environment to pedagogical practices and to the production of pedagogical knowledge.

At the second stage interdisciplinarity became more important, in that

the groups began to understand the projects through the development and implementation of a complex perspective as they examined the local phenomena. Whereas during the first stage of the projects interdisciplinarity was only apparent in the interaction of the disciplines in terms of defining the research problems, in the second stage the interdisciplinary approach referred to the three above-described objectives, as the need to tie in an approach that is responsive to the complexity of the objectives of local and pedagogical research. In this stage innovation took place in terms of the roles and ways of relating that were encouraged between the teachers and the students, the proposed learning objectives of the pedagogical practices, and the curricular shift that took place at the schools.

In terms of the first objective, the production of knowledge about the local environment, the projects defined different research phases. In environmental education, the first phase consisted of examining the environment in order to identify it. In the second phase work was done on this first approximation through analytical categories and the design of instruments. In the third phase fieldwork was done to produce the information that the study required, the information was read and analyzed, and the results were determined:

In the year 2002, the pursuit of the research by the RED collective is somewhat more organized, working in the school and municipal contexts. In the municipal context four phases were pursued, each with a set of actions. In the first phase a fieldtrip was made to visit non-school settings, such as community centers, other settings for learning ... In the second phase, after visiting the community centers, the tenth grade students were given orientation about organizing groups, with the purpose of dialoging on and conceptualizing the main aspects to be taken into account in pursuing this phase, such as: ethnographic observation, the location of the neighborhood and the description of its boundaries ... In the third phase the surveys were applied, results tabulated, graphs and percentages were produced, which appear in the studies done in each neighborhood. ... In the fourth phase the links between the RED Program environmental project and the natural sciences area may be seen clearly, in the presentation made to the community. (Normal Superior Santa Ana de Baranoa, 2007)

During the first stage we worked on the children and the community’s vision and interests on the subject of water, using the methodology

of participatory action-research, in which we did interviews with the rural inhabitants on the subject of water, on the legends and celebrations or rituals that have to do with it. With this information we did a preliminary analysis and identified the adults' concepts on the subject. Meanwhile in the classroom, with the children, we developed a battery of questions on some of the following subjects: the uses of water, its origin, the physical and chemical properties of water, and the natural phenomena that are related to it. These questions have been addressed both in traditional classroom activities and in pedagogical fieldtrips to the countryside, visits to the sources, streams, lakes, Bogotá's marshes, and talks with the rural people who work with the different ecological organizations. (Los Soches Rural School, Bogotá, 2007)

In the urban education projects, three significant elements appeared: time, space, and people. As such, the projects were organized into three phases: habitat, inhabitants, and citizenship, with the logic of a three-pronged pedagogical perspective—knowing the city, appropriating it, and participating in its development:

In May 2002 with these inputs, the guidance of the National University facilitator and having read some documents ... the aim was to come up with semiotics of the city of Villavicencio, address[ing] the physical knowledge of the city (structure and functions), the city's formal content (citizen values, Constitution) and the practical relation between what the people know, say, and do. (Luis López de Mesa INEM School, Villavicencio, 2007)

The group planned to work for three years, structuring the different areas or academic subjects using the project as the thematic axis. In its unfolding, three teaching units based on fundamental topics were considered, habitat, inhabitants and citizenship: Habitat: What is our city like, what are the changes that have marked the life of the residents of Ibagué? Inhabitants: Who are the inhabitants of Ibagué? How do the people describe themselves? Citizenship: How are the city and citizenship built?" (Liceo Nacional de Bachillerato, Ibagué, 2007)

These ways of organizing the research on the local environment made it possible for the university professors, schoolteachers, and students to

work together on the research topics that, because of their complexity, required the linking of points of view and the construction of frameworks for interpretation that respected the complexity of the phenomena being studied.

3.3 Some Results of the Interdisciplinary Curricular Projects

The interrelation between research and pedagogical practice, mediated by the notion of interdisciplinarity as applied in the ICP, may also be seen in some of the results written up by the groups of teachers at the participating schools and in the university's monitoring. In summary, these results may be analyzed from four perspectives: the production of local and pedagogical knowledge, changes to curricular, pedagogical and school practices, teacher education, and school-environment relations.

The production of knowledge, a result of the local and pedagogical research, is one of the results of the ICP:

Since 2000 and until 2004, we attained different achievements such as having acquired significant knowledge of the historical, geographic, bionatural, sociocultural, and economic contexts of the bodies of water in the municipality of Galapa. The students were able to recover the [memory] of the historical legacy as recounted in the oral tradition by the elders of the region, about how these bodies of water came to be. The residents of Galapa's urban area were unfamiliar with the main bodies of water that have marked their history, as in the case of the first well that supplied the entire town of Galapa, "the German's well," which nowadays is located on private property on the San Nicolás farm. (Francisco de Paula Santander School, Galapa, 2007)

Starting in the 19th century, with the creation of the Jewish district and the Cachimbero in the zone next to the Soledad stream, land has been taken over spontaneously, meaning demographic growth gave rise to the need for urban expansion and that is how new neighborhoods were created, where sometimes municipal offices merely laid out blocks, streets and avenues, and sometimes not even that, as may be seen in sectors of the downtown area in which some of the streets are dead-ends or simply end facing a house. Neighborhoods like La María, El Carnero, and San Antonio, which were created as of the 1940s in the western part of the municipality, follow the same

model. These areas were farms or fields whose owners were local people who started selling their land in parcels on which houses were built, without planning, without public utilities or roads. At the time, the residents of Soledad had a style that mixed rural and urban life (Dolores María Ucrós School, Soledad, 2007).

In terms of the production of pedagogical knowledge, the projects reveal changes at the schools that are significant for the agents involved:

In the first place, thanks to the project it was possible for the participating students to go from being passive to being the protagonists of research that enabled them to learn things like how to formulate a project, propose hypotheses, propose objectives, suggest research topics, produce new knowledge about the road network and traffic flow in their city, develop a sense of belonging to the city, develop a sense of responsibility in a group, develop skills to gather information, process it and interpret it, design instruments for gathering information, learn to find information in print sources, have life skills and the ability to navigate in the city, have more solidarity, and to feel important and be taken into account as the students that they are. Second, through the actions of the research project, it has been possible to break away from the traditional ways of teaching, in that the teachers and the students approach the tasks together, in a cordial relation as equals. (Helena de Chauvin School, Barranquilla, 2007)

The innovations that derive from the learning objectives and the innovations that arise from incorporating research logic into the pedagogical work therefore bring new meaning to pedagogical practices, creating an environment for students and teachers to relate as equals.

As well, the ICP gave rise to different forms of curricular organization. At some schools, local issues became a main axis for the curriculum, and education goals defined the creation of areas of knowledge that group school subjects by their bearing on the research projects.

In this way, the school, perceiving the ongoing lack of connection between the processes carried out in the classroom and daily life, has made real life into the crosscutting axis for the curriculum... This is organized into four macro areas that take into account the different dimensions of human existence and involve the different disciplines in crosscutting projects. However, the school does not refer to this

as interdisciplinarity but rather integration, understood as a strategic merging of subjects, which has become one of the pillars of the curricular project. (Francisco de Paula Santander School, Galapa, 2007)

We understood that knowledge is not circumscribed to certain disciplines. The priority is to be clear on the construction that the sciences demand in the general structure of the concepts that are gathered from daily life, where knowledge is developed and applied and what is sought is an interdisciplinary approach to arrive at a contextualization of the knowledge. Integrating mathematics, arts, Spanish, technology, and social sciences in the different actions to produce knowledge directed at the project is to vindicate a highly valuable dialogue of knowledge, among teachers with very disparate perceptions. An example of this was the understanding, readings, interpretation and construction of scale maps and graphics of the neighborhoods and the municipality of Ibagué. (Liceo Nacional de Bachillerato, Ibagué, 2007)

The curriculum is the outcome of a process of interactive realization and implicit negotiation in the classroom and the school. However, now—thanks to the ICP—the school community consciously and explicitly takes control of the curriculum, and defines valid knowledge, worthy of being learned. The school community also establishes the “organizing principles” of curriculum as

literacy, or an emphasis on written as opposed to oral presentation, individualism (or avoidance of group work or cooperativeness) which focused on how academic work is assessed and is a characteristic of both the ‘process’ of learning and the way the ‘product’ is presented; abstractness of the knowledge and its structuring and compartmentalizing independently of the knowledge of the learner; finally and linked to the former is what I have called the unrelatedness of academic curricula, which refers to the extent to which they are ‘at odds’ with daily life and experience.” (Young, 1971, p. 38)

In the construction of these ways of organization and the process of implementing them in the classroom, the teachers acknowledged that a dynamic of education and self-teaching arose that empowered and catalyzed them as the agents of their own practices, as researchers, and as intellectuals who participate in the construction and transformation of society. (Giroux, 1997; Rodríguez, 2005)

The project not only made it possible to break away from everyday practices in the classroom, but it also impacted the teachers' processes for self-education, expanding their knowledge, bringing them into contact with reading primary sources, catalyzing teamwork, and promoting individual commitment to group agreements, giving rise to learning beyond the classroom, a work ethic, and motivation over a topic. (Helena de Chauvin School, Barranquilla, 2007)

Not to be underestimated in the project's achievements is that, as a whole, this process of research on an issue, that entails gathering and recording information, systematizing it, interpreting it, and analyzing it, has brought about changes at the school and to the teachers, and has transformed pedagogical practices to a culture of working as a team that breaks away from the isolation of the teacher's traditional role, to make them active agents of pedagogical knowledge. (Atanasio Girardot School, Bogotá, 2007)

This is not about having the teacher do research concurrent with his [sic] teaching activities, but rather of adopting a perspective in his [sic] daily actions, that restructures the conceptual model that orients the practice. The curriculum is considered open-ended and in constant change, addressing knowledge as a permanent process of construction, relating the problems of the *why* and *what* of teaching or how to do it. So that interaction takes place between public or social knowledge (which the students and the teachers have) and the academic body of knowledge (as interpreted by the teacher). (Francisco de Paula Santander School, Galapa, 2007)

The school's relation to its environment enters different dynamics in that, beyond local context, the ICP place the school into new dimensions that give it new meaning and dignity. Different dynamics are established between the local environment and the world, and education for active citizenship is impacted, involving the young people in the dynamics of academic study and life in society. This goes beyond the school's job, based on the functions of teaching and learning:

Third, the project's dynamics have made it possible for the school to enter into contact with city agencies, establishing new and fruitful interinstitutional relations, engaging in activities in benefit of the city and the school. (Helena de Chauvin School, Barranquilla, 2007)

What everyone gains from the ICP is the desire to investigate, because the students are no longer at the mercy of what the teacher says, but rather they have had the opportunity "to go out, to see, to speak to the people in the community that are directly affected by the problem of water" and to create new knowledge that is later checked in the classroom. As such, they have been the ones who have realized the magnitude of the problem and where to broach it to work on this quickly. (Francisco de Paula Santander School, Galapa, 2007)

In this sense, it is hoped that the students can understand global-local phenomena... as well as using certain methodological and technical approaches from different disciplines to analyze a problem. (Sorrento School, Bogotá, 2007)

The students in eighth grade have been able to publicize the environmental problem at different events, such as Expoambiental 2002, the Naturaliando program on TeleCaribe, District Forum on Environmental Education... Meeting of Environmental Education Projects by Atlantic Coast Schools, forum for environmental projects by the different schools in the municipality of Galapa, and recently they participated in the contest by Unilever Andes, a company that provides support to the best environmental education programs aimed at increasing an appreciation for water, in which they received first prize as the best environmental education project in Atlántico Department. These events enabled the students and teachers to publicize the project's achievements at the national level, and share with other schools in Colombia the significant learning deriving from the search to create a true culture of appreciation for water, with respect, love, conservation, a sense of water in our bodies' natural makeup; so as [to] guarantee better quality of life for the inhabitants of the municipality of Galapa. (Francisco de Paula Santander School, Galapa, 2007)

The pursuit of the projects at the schools also brought the schools into contact with new agents and led to rethinking and recognition for the two main protagonists: the students and the teachers. Parents, community leaders, experts, and even the neighbors got involved in the project. The recognition of the students as individuals with knowledge was one of the achievements that made it possible to progress at each stage. Teachers and students acknowledged each other as explorers, discoverers, apprentices, and colleagues in the search.

Turning the characteristics of the neighborhood where one lives or a style of citizen participation into a topic of study necessitates acknowledging that the city—each block, neighborhood, or district—produces knowledge that can be used in the classroom and that is worthy of being considered as an object of study. This acknowledgment enables the school to expand its limits. Physically, the school also opens its doors, because learning is not only taking place in the classrooms but also in parks, streets, houses, public buildings, or locations that exhibit environmental or social problems. The students have entered into contact with the reality of their cities, and they are able to ask about the role that the school should play in resolving different local problems. They have become aware that the solution to local problems is not separate from democratic action and a critical attitude toward the local administration.

Conclusion

In contrast to mainstream pedagogical issues or consolidated school subjects, the environment, urban issues, and interdisciplinary studies are recent arrivals in Colombian schools, but during their brief existence they have shown developments that have been fruitful, provocative, and catalyzing of school life and that address the very meaning of this institution in the contemporary world. It was not by accident that the National University proposed an interdisciplinary approach with the schools; interdisciplinary studies have traditionally been part of the university milieu and from there they have spread to primary and secondary education. We know that interdisciplinarity is not really the schools' business, whereas integrating knowledge is, but this makes sense in the context of the school-university relation. Nor is the interdisciplinary approach an end in itself; it is a way of relating knowledge to understand and transform the world, and to understand and transform knowledge. It provides an occasion for interacting differently, to draw more complex and comprehensive visions of our world and ourselves.

The interdisciplinary projects—when these are more than just a formality—show themselves to be one of the few initiatives that, despite the difficulties, are able to involve different groups, stimulate teamwork, bring new knowledge to the schools and new ways of using it, giving meaning and application, opening up doors and windows, and connecting the schools to their environments or, at least conceiving of schools as better places to be.

However, the schools are not currently organized to carry out these projects, to incorporate their dynamics, or to make possible and handle the new interactions that result. Neither the student groups, the timetable, the administrative structure, the relations among teachers, the curricular programs, the concepts of control, discipline, and evaluation, nor the provisions and pressures on the administration of education allow—much less favor—the implementation of these kinds of projects.

For this reason, and with only a handful of exceptions, the projects are being pursued against the tide, requiring exceptional efforts, done voluntarily, on the sidelines, and even clandestinely in a hostile environment that does not appreciate these efforts or that looks upon them with condescension. The students also see them as something unimportant, as an occasional escape from daily drudgery but not as something of value, and think that, at heart, they do not address their interests. Because of their lack of prominence, the complexity of the issues and problems, whose richness requires the mobilization of all areas of knowledge and deserves considerable resolve, these wind up minimized and reduced to activism, distanced from academic life and the classroom, and confined to a world that is hard to assess, such as that of values and attitudes.

These kinds of projects are not feasible without external support and without strengthening interinstitutional relations, especially with the universities. However, if the schools do not become more autonomous, if they are unable to consolidate their own dynamics, the external support would be wasted, or else the risk is that of falling into a relation of dependence that, rather than strengthening the schools, weakens them. The education reforms undertaken in Colombia in the late 1990s aimed to make management more efficient and improve results on standardized tests, elements that have become synonymous with quality, and rather than making interdisciplinary work possible in the schools, this debilitated their autonomy and their capacity for innovation and teamwork (Miñana & Arango, in press).

The university catalyzes its historical mission when it facilitates a dialogue among different disciplinary and academic traditions with local traditions in order to recognize diversity and to expand democracy (Rodríguez & Garzón, 2003). Collaborative school-university initiatives produce many benefits for those who inhabit and operate in the two institutions. The consolidation of alternatives of an interdisciplinary nature has produced new horizons for the solution of issues that affect most of the people, in a process of learning and becoming active as citizens.

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