An Educational Revolution to Support Change in the Classroom:

Colombia and the Educational Challenges of the Twenty-First Century

Daniel Light
Education Development Center, Inc., Center for Children and Technology
United States

Micaela Manso
Maria Teresa Noguera
Fundación Evolución
Argentina

May 2007

This research was funded by the Intel® Foundation.

ACKNOWLEDGEMENTS

This research was conducted by Fundación Evolución (FE) and Education Development Center, Inc. (EDC) with the support of the Intel Foundation. FE and EDC acknowledge all of the people and organizations that contributed to this paper. We would especially like to thank the following individuals who generously gave their time to be interviewed:

- Juana Inés Díaz Tafur, Vice Minister for Preschool, Primary and Secondary Education
- Claudia Zea, Special advisor on New Technologies at Ministerio de Educación Nacional
- Javier Orlando Torres Paez, Chief Officer of the Oficina de Informática
- Mónica López Sub-Director of Educational Improvement
- Ingrid Vanegas: Sub-Director for Standards and Evaluation
- Maria Isabel Mejías Jaramillo, Executive Director, Computadoras para Educar

- Juan Manuel Cuellar, Education Manager, Intel® Colombia
- Marcela Aristizabal, Intel® Colombia

- Luz Adriana Osorio Gomez, Director, LIDIE, Universidad de los Andes
- Ana Maria Zalazar Villegas, Evaluation Coordinator at LIDIE, Universidad de los Andes

- Maria del Rosario Atuesta Venegas, Co-Director, Proyecto Conexiones, Universidad de EAFIT

- Cesar Augusto Cangrejo Orjuela, Manager of New Technologies for the Municipality of Soacha
- Mirella Lozano, Assistant Manager of New Technologies for the Municipality of Soacha

INTRODUCTION

EDUCATIONAL REFORM: THE TWIN FORCES DRIVING CHANGE

Colombia, like many developing countries, faces a common set of challenges in meeting the increasing economic and social demands of globalization. As a process of economic integration and market openness to external trade, globalization offers the possibility of accelerated economic growth. Yet, to take advantage of the opportunities that globalization presents, countries must be able to increase their competitiveness[1] by developing a competent and flexible work force. In the early years of the twenty-first century, success in achieving greater levels of competitiveness is based on significant and sustained efforts in educational reform.[2] As economic systems require new skills and abilities, education systems must prepare young people to meet these challenges.

However, education reform is not purely an economic issue. National educational policies must also respond to a country's interests and social needs. Many Latin American countries, including Colombia, share the goal of building a democratic, participatory, and responsible society.[3] At stake is students' ability to become active citizens and to participate in the creation of politically and economically stable and prosperous societies.

EMBRACING A TWENTY-FIRST CENTURY VISION OF EDUCATION

Since 2002, the Colombian government has pursued a well-structured and coherent reform effort that is designed to transform its public education system. To meet its goals for its citizenry, the country is moving from a traditional model of education to a comprehensive "twenty-first century" educational paradigm, working to enhance quality, expand school enrollment and improve access to education, and increase administrative and financial efficiency. Colombia's reform strategies emphasize the use of information and communication technology (ICT), and the country is not alone in this.

Around the globe, ministries of education are using ICT to strengthen the foundations of the twenty-first education systems they are building. The educational policies in countries such as Australia, China, Finland, Ireland, Singapore, South Korea, and the United Kingdom are based on the strong relationship between the use of new forms of ICT and the development of capacities such as reasoning, knowledge creation, problem-solving, and creativity.[4] For example, the I-Curriculum Project[5] is studying how five European countries are using curriculum requirements for teaching digital technologies to help students meet the challenges of living and working in the digital age. Worldwide, these and

---

[1] Stiglitz, J. (2002). *Globalization and its Discontents*. New York: Norton.
[2] Kozma, R. (2005). National policies that connect ICT-based education reform to economic and social development. *Human Technology, 1*(2), 117-156.
[3] Astiz, M. F., Wiseman, A. W., & Baker, D. P. (2002). Slouching towards decentralization: Consequences of globalization for curricular control in national education systems. *Comparative Education Review, 46*(1), 66-88.
[4] Honey, M. (2006). Background. In Board on Science Education (Ed.), *ICT Fluency and High Schools: A Workshop Summary*. Washington D.C.: The National Academies Press.
[5] NESTA Futurelab. (2004). *I-Curriculum Project* Retrieved October, 25, 2006, from http://promitheas.iacm.forth.gr/i-curriculum/index.html

other ICT efforts start with the premise that technology is transforming the twenty-first century and changing the nature of human activity itself through the use of new tools.

Yet, to establish twenty-first century education systems, countries' adoption of ICT must be part of a larger process of conceptual and systemic change. A growing body of literature identifies five policy dimensions that must be part of this process and that are key to the transition to a twenty-first century education paradigm: curriculum, pedagogy, assessment, teacher professional development, and school organization.[6] Policy research demonstrates that successful reform of education systems requires close alignment of missions, investments, and goals across these dimensions, clearly-defined and well-coordinated short- and long-term goals, and benchmarks to track and monitor progress throughout the reform process.[7] This type of multi-dimensional approach is long-term and incremental; reform cycles can extend over decades and require sustained investment in schools' physical and technical infrastructure. To progress, ministries must tackle systemic change head-on by embracing a shared, system-wide vision of and commitment to good teaching and learning.

A SYSTEMIC CHANGE CASE STUDY

With its Revolución Educativa (Education Development Plan),[8] Colombia offers an interesting case study of a country that has instituted comprehensive education policies—that are grounded in a shared vision of quality and that make skillful use of ICT—to tackle economic and social concerns. Developed by the Ministerio de Educación Nacional (MEN) (ministry of education), the Revolución provides an example of how ministries can coordinate educational reforms to create twenty-first century education systems. An in-depth description of the plans and actions that compose the reform follows, with special attention on the role of ICT and the integration of the Intel® Teach Program into reform efforts. This work was developed by Education Development Center, Inc. (EDC) of the United States, with the collaboration of the Fundación Evolución from Argentina, and it was funded by the Intel Foundation.

---

[6] Hepp, P., Hinostroza, J. E., Laval, E., & Rehbein, L. (2004). *Technology in schools: Education, ICT and the knowledge society*. Washington, DC: World Bank, Kozma, R. (2005). National policies that connect ICT-based education reform to economic and social development. *Human Technology, 1*(2), 117-156, Osín, L. (2000). Dimensiones de cambio en los sistemas educativos de América Latina: América Central en el contexto de políticas de educación en las Américas. In J. C. Navarro, K. Taylor, A. Bernasconi & L. Tyler (Eds.), *Perspectivas sobre la reforma educativa* (pp. 129-146). Washington, DC: Inter-American Development Bank.

[7] Kozma, R. (2005). National policies that connect ICT-based education reform to economic and social development. *Human Technology, 1*(2), 117-156, Lee, J. (2001). School reform initiatives as balancing acts: Policy variation and educational convergence among Japan, Korea, England and the United States. *Education Policy Analysis Archive, 9*(13), 11, Osín, L. (2000). Dimensiones de cambio en los sistemas educativos de América Latina: América Central en el contexto de políticas de educación en las Américas. In J. C. Navarro, K. Taylor, A. Bernasconi & L. Tyler (Eds.), *Perspectivas sobre la reforma educativa* (pp. 129-146). Washington, DC: Inter-American Development Bank.

[8] The Revolución Educativa was proposed by the government of Álvaro Uribe as one of seven policy tools that the administration initially proposed as part of its commitment to promote social justice.

THE ROLE OF EDUCATION IN COLOMBIA'S NATIONAL DEVELOPMENT PLAN

Since the late 1980s, Latin American countries have used similar strategies to reform their education systems to meet the challenges of the new era.[9] Increasingly, the leaders of these countries are viewing educational services as a mechanism of modernization, democratization, and national development.[10] Colombia's leaders, for example, believe that education is the key to addressing two of the country's biggest challenges: (a) the concern for social peace, inclusion, and social integration; and (b) the need for economic development in an era of competitiveness and globalization. They believe that a revitalized, twenty-first century education system is the pathway to a fair, tolerant, and stable society.

Colombia's educational vision and reforms grew out of broad social dialogues that involved a diverse group of representatives from social, political, and economic arenas. These dialogues culminated in the 1991 Asamblea Consituyente (Constitutional Assembly) which rewrote the national constitution.[11] Thus, for more than a decade, debates about education reform have been connected to larger discussions about Colombian society. As a result, the Revolución Educativa was woven into the country's Plan Nacional de Desarrollo (PND) (National Development Plan). As an integral component of a larger social change agenda, the Revolución calls for a complete transformation of the education system.

THE GOALS OF THE PLAN NACIONAL DE DESARROLLO

A national effort formulated for the period 2002–2006, the PND emerged from lessons learned during the country's difficult years of violence and social and economic turmoil in 1999 and 2001. The government recognized that political and social stability is the result of an increase in a country's productive capacity. This capacity is, in turn, supported by three factors: educational advances, enhanced abilities of the labor force, and technological development.[12] Based on this knowledge, the government sought to establish programs in four strategic areas. Education is a fundamental component of three of these areas—social equity, economic growth, and democratic security—and, as noted below, ICT work in the Revolución Educativa has provided some useful models for the fourth strategic area, transparency and efficiency of the state.

THE ROLE OF ICT IN THE PLAN NACIONAL DE DESARROLLO

The PND directly addresses the issue of ICT in Colombian society with the Agenda de Conectividad[13] (Connectivity Agenda). Working through the Ministerio de Communicaciones (Ministry of Communications), the Agenda is an inter-ministerial group

---

[9] Kaufman, R. R., & Nelson, J. M. (2005). *Políticas de reforma educativa comparación entre países.* Santiago: Programa de Promoción de la Reforma Educativa en América .Latina (PREAL), Tedesco, J. C. (2000). *Educar en la sociedad del conocimiento*. Buenos Aires: Fondo de Cultura Económica.

[10] Corrales, J. (1999). *Aspectos políticos en la implementación de las reformas educativas.* Washington DC: Programa de Promoción de la Reforma Educativa en América Latina y el Caribe.

[11] Cajiao, F. (2004). La concertación de la educación en Colombia *Revista Iberoamericana de Educación, 34*, 31-47.

[12] Departamento Nacional Planeación. (2003). *Plan Nacional de Desarrollo 2002-2006, Hacia un Estado Comunitario* (No. 8025-43-5). Bogotá.

[13] For more information see http://www.agenda.gov.co.

that is attempting to extend Internet access by creating access points in public locations (e.g., libraries, community centers, low-cost Cyber-cafes) throughout the country. The success of ICT in the schools and programs like Computadoras para Educar (Computers for Education) has fostered increased collaborations between the MEN and the Ministerio de Communicaciones on the work of the Agenda.

COLOMBIA: A MODEL OF TWENTY-FIRST CENTURY EDUCATION REFORM

THE SEEDS OF A REVOLUCIÓN

Current reviews of Latin American education reform suggest that the efforts of the 1990s often failed to address basic questions around the changing role of education in society and the quality of public education.[14] These efforts often began by focusing on challenges of decentralization and institutional changes, and have yet to change classroom practice and the learning environments that most children in the region experience.

Colombia followed a similar pattern in the 1990s, adopting an early emphasis on institutional change rather than initiating a broad discussion of the role of education.[15] By the end of the 1990s, parts of the Colombian education system had begun to change in terms of decentralization and institutional structure. Despite innovative changes in education laws and an initial restructuring of the education system, however, schools still used traditional methods (e.g., teacher-centered learning, rote memorization),[16] and there was little impact on the nature of teaching and learning in most classrooms.[17]

According to the country's SABER test results,[18] in 1999, only 20% of the students in the fifth and ninth grades could read and understand texts at an acceptable level, and 11% could solve problems that required abstract and conceptual thinking. In 2002, Colombia's college entrance exam results indicated that 61% of the public schools could be considered "low performing."[19] International measures of educational performance also served to highlight Colombia's educational challenges. The results of the tests of the Laboratorio Latinoamericano de Evaluación de la Calidad de la Educación (Latin American Laboratory

[14] Kaufman, R. R., & Nelson, J. M. (2005). *Políticas de reforma educativa comparación entre países.* Santiago: Programa de Promoción de la Reforma Educativa en América .Latina (PREAL), Martinic, S. (2001). Conflictos políticos e interacciones comunicativas en las reformas educativas en América Latina. *Revista Iberoamericana de Educación, 27*, 17-33, Tedesco, J. C. (2000). *Educar en la sociedad del conocimiento*. Buenos Aires: Fondo de Cultura Económica.

[15] Cajiao, F. (2004). La concertación de la educación en Colombia *Revista Iberoamericana de Educación, 34*, 31-47.

[16] Gajardo, M. (1999). *Reformas educativas en América Latina: Balance de una década.* Santiago: Programa de Promoción de la Reforma Educativa en América Latina (PREAL).

[17] Borjas, G., & Acosta, O. L. (2000). *Education reform in Colombia.* Bogotá: Fedesarollo, Cajiao, F. (2004). La concertación de la educación en Colombia *Revista Iberoamericana de Educación, 34*, 31-47.

[18] Instituto Colombiano para el Fomento de la Educación Superior. *Programa de Evaluación de la Educación Básica – Pruebas SABER.* Retrieved October 2006, from http://200.14.205.63:8080/portalicfes/home_2/rec/arc_593.pdf

[19] Instituto Colombiano para el Fomento de la Educación Superior. *Exámen de Estado para Ingreso a la Educación Superior*. Retrieved October 2006, from http://200.14.205.63:8080/portalicfes/home_2/rec/arc_340.pdf

of Evaluation of Educational Quality) revealed that Colombia was below the region's average, and the Progress in International Reading Literacy Study (PIRLS) ranked the country 30th among 35 participant countries.

Colombian leaders' acknowledgment of the deterioration of the quality of their country's education system drove the government to place a high priority on improving quality. In launching the Revolución Educativa, the MEN's goal was not only to increase student performance on educational tests, but to transform how they learn and what they learn and to support them in becoming critical thinkers and lifelong learners.[20]

DESIGNING A MODEL WITH QUALITY AT THE CORE

As countries strive to strengthen their educational institutions, a common tension often arises between providing more access to public education and improving the quality of education. The MEN, however, perceived that Colombia's educational quality and accessibility challenges were inextricably linked and enmeshed in an outdated traditional educational paradigm. To reach its goals for its citizenry, the MEN recognized that it needed to take a holistic approach to transforming this paradigm and establishing a shared responsibility and vision for its system.

In designing the Revolución Educativa, the MEN identified a series of complementary and synergistic strategies that address all five policy dimensions critical to a twenty-first century educational paradigm and that keep the drive towards quality in the forefront.[21] The next sections of this paper describe these strategies:

- Local Capacity Building
- Enrollment and Efficiency
- ICT: Programa Nacional de Nuevas Tecnologias (New Technologies Plan)
- Curricular Reform
- Pedagogical Reform, Improving Teaching, and Professional Development
- Assessment System

Local Capacity Building

In recent decades, Colombia has shifted educational authority from the federal government to secretariats from the departamentos (provinces) and major municipalities, and again from the intermediate levels to the schools themselves.[22] In the resulting highly decentralized, three-level education system, local leaders bear a great deal of responsibility for implementing education reforms. At the highest level is the *MEN*, which is in charge of defining policies and bringing technical support to other levels. The *departmental level* includes the secretariats of education, the Regional Educational Fund, and the Training Committees.[23] The third level is composed of the *municipal secretariats of education*,

[20] Ministerio de Educación Nacional. (2002). *Plan Sectorial 2002-2006*. Bogotá: Author.
[21] Ibid.
[22] Martinic, S. (2001). Conflictos políticos e interacciones comunicativas en las reformas educativas en América Latina. *Revista Iberoamericana de Educación, 27*, 17-33.
[23] Note: The provincial secretariats are in charge of coordinating educational services and administration of public funds. Law 60 of 1993, allows the departmental authorities to decentralize the administration of

which are mainly in charge of supervising the provision of services and investing in and maintaining school infrastructure. Each level of the system must play a pivotal role in the Revolución Educativa, and all must share in its vision for a twenty-first century educational system.

This type of multi-level, decentralized system has many benefits (e.g., responsibility for education is much closer to parents and communities, parents and communities have a greater voice in decision-making). However, in many countries—including Colombia—decentralization has created a demand for qualified leadership that has overwhelmed capacity. The lack of local capacity was particularly acute in Colombia,[24] and there are still not sufficient numbers of trained and experienced educational leaders at every level of the system. In an interview, Juana Inés Díaz Tafur, Vice-Ministra de Pre-Escolar, Básica y Media (Vice-Minister for Preschool, Primary, and Secondary Education), emphasized the importance of strengthening the local entities so that they have the capacity to efficiently run their education system (Juana Inés Díaz Tafur, personal communication, August 3, 2006).

Redefining the MEN's Role

In response to this need, the MEN has attempted to transform its relationship with the secretariats to provide support, rather than just issuing decrees and mandating reforms. According to Mónica López, the MEN Sub-directora de Mejoramiento (Sub-Director of Educational Improvement), the MEN now provides guidance and training that enables regional authorities to effectively change their practice:

> I would say that the aspect that is new is how to connect everything and the mechanisms to move it down into the classroom. Before, policy was sent out as memos if not as posters or edicts. What's novel about the improvement efforts in this case is to be able to reach the classrooms and to actually reach into the secretariats. Even though the law requires the MEN to strengthen the secretariats, it has always stayed out. The novelty is that the MEN is advising and supporting the secretariats, working hand and hand with them. Strengthening the institutions is a central theme of the policy[25] (Mónica López, personal communication, August 3, 2006).

The secretariats, then, provide support and guidance to the schools. To further the objective of strengthening institutions, the MEN brings together people who are dealing with

---

services and transfer them to qualified municipalities. The Regional Educational Fund was created to administer transferred resources. The training committees are in charge of defining training programs offered to teachers.

[24] Kaufman, R. R., & Nelson, J. M. (2005). *Políticas de reforma educativa comparación entre países.* Santiago: Programa de Promoción de la Reforma Educativa en América .Latina (PREAL).

[25] Original quote follows: "Yo diría que lo nuevo es cómo poder articularlo y los mecanismos de bajada de la política si son nuevos. Antes la política bajaba a través de textos regulares sino de cartillas, pronunciamientos. Lo novedoso de la acción de mejoramiento en este caso es poder llegar al aula pero sobre todo poder llegar a las secretarias aunque por ley esta que el MEN tiene que fortalecer las secretarias pero ha estado por fuera. La novedad en el MEN es el acompañamiento a las secretarias, estar trabajando con ellas de la mano. Esto es un tema central de la política: fortalecer las instituciones."

common challenges. The MEN has required that the secretariats create specific positions (if these do not yet exist) that mirror key positions in the ministry to create a network of administrators with common functions. For example, each secretariat must appoint an ICT coordinator who interacts with the national advisor on ICT. The MEN officials and their counterparts from the secretariats meet every month to share problems and discuss solutions and strategies. This allows the MEN to keep up with each secretariat's needs and to provide appropriate support. The meetings also allow secretariat staff to learn from each other.

Toward a Shared Vision: The Ciclo de Calidad

To realize the goals of the Revolución Educativa, however, the secretariats must not just possess the capacity to carry out the work; they must share the MEN's commitment to the core vision of quality and twenty-first century education underlying the Revolución's reforms. Ms. López believes that one of her primary challenges is to cultivate this shared understanding with the secretariats. She noted that, "What we are looking for is that our counterparts at the secretariats understand the perspective and also how to make it happen."[26] (Mónica López, personal communication, August 3, 2006).

At the nexus of the MEN's thinking on promoting a shared vision of quality is what the MEN calls the Ciclo de Calidad (Quality Cycle), an improvement process that places the school, municipal, and departmental secretariats in control of identifying their issues and devising strategies to improve.[27] The model is composed of three stages: (a) defining shared standards of skills and competencies that can be aligned across the education system; (b) assessing student, teacher, and school performance on those standards to evaluate progress; and (c) designing and implementing a Plan de Mejoramiento Institucional (School Improvement Plan). The Ciclo de Calidad can be used at all three levels of the system to evaluate and improve performance. But, it also provides a structure that allows the MEN to engage local leaders in a twenty-first century education system visioning process in which they assess their schools' strengths and challenges, devise strategies to address those challenges, and identify needed resources and supports.

The third stage, developing a Plan de Mejoramiento Institucional, helps schools chart a clear course to improving and transforming the education they offer students. Schools design these plans based on their knowledge of their own unique needs and contexts, and the plans are conceived as "the 'compass' that guides the path the institution will follow to improve all the time."[28] The MEN expects schools' plans to strive to help students meet or exceed the new basic standards. The innovative proposal of the Revolución Educativa is based on the assumption that when schools develop these plans they will be better able to connect the management of the institution with a student-centered pedagogic proposal and teachers' professional development.

[26] Original quote follows: "Lo que buscamos es que los homólogos de las secretarias entiendan la línea y el 'cómo.'"
[27] Ministerio de Educación Nacional. (2004b). *Planes de Mejoramiento: y ahora ¿Cómo mejoramos?* (No. 5). Bogotá: Author.
[28] Sub-Director of Educational Improvement.

According to Ms. López, while the plans contribute to the establishment of a shared vision of quality, secretariats retain the ability to tailor their strategies to fit the unique needs of their regions. For example, the Secretariat of Education for Bogotá shares the MEN's vision of quality learning, but usually has its own strategies for moving forward.

Enrollment and Efficiency

By the end of the 1990s, enrollments in enseñanza primaria (primary schools) were reaching acceptable levels. However, levels of enrollment in enseñanza media (upper primary) and enseñanza secundaria (secondary education) remained low. In 2002, the MEN estimated that two million children and adolescents, mainly from rural areas, were outside the system. In rural areas, the coverage rate for secondary school was 15%.[29] Half of the children between age 5 and age 6 remained outside of the education system, as did youths between 16 and 17 belonging to the poorer classes. The system was also characterized by low levels of efficiency, with rates of grade repetition and desertion for the first grade at 11% and 12% respectively. According to the results of a Quality of Life Survey for 1997, 64% of the low enrollment was due to the fact that schools did not have physical space to accommodate students, and 29% was due to students' lack of motivation and interest in attending school.[30]

These poor results persisted in spite of major efforts to improve education in the country and an increase in the budget assigned to education, which went from 3.2% to 4.7% of the GNP.[31] By the beginning of the twenty-first century, and prior to the launch of the Revolución Educativa, there was a clear need to modernize the system's institutional structures, processes, incentives and supervision schemes to boost enrollment and to promote a more effective use and allocation of resources.

The Revolución Educativa uses a number of different strategies to address enrollment and efficiency issues. An improved ICT-based information management system is fundamental to many of these strategies. Previously, the MEN did not have the ability to collect reliable data about schools and students, nor did it have mechanisms for monitoring and evaluating the use of financial resources by departmental agencies.[32] Under the leadership of the MEN's Oficina de Informática (Office of Computer Services), the ministry now has a modern, nationwide information management system that contains student, school, regional, and national data. The system allows the MEN, as well as local and provincial administrators, to track attendance and enrollment issues, and it provides educators, parents, and communities with data about the performance of students and schools.

The new system more efficiently aligns schools that have space for students with populations of students. According to Javier Orlando Torres Paez, head of the Oficina de Informatica, "In basic education, the role [of information systems] is simply to support the management of enrollment and coverage, in order to make decisions about where we are

[29] Ministerio de Educación Nacional. (2002). *Plan Sectorial 2002-2006*. Bogotá: Author.
[30] Ibid.
[31] Borjas, G., & Acosta, O. L. (2000). *Education reform in Colombia.* Bogotá: Fedesarollo.
[32] Ibid.

going to increase coverage and where there are children who are not being served"[33] (Javier Orlando Torres Paez, Personal Communication, August 3, 2006).

The MEN is also using a program that subsidizes the demand for services to the private education sector. According to Juana Inés Díaz Tafur, Vice-Ministra de Pre-Escolar, Básica y Media, the MEN achieved 96% of its 2002 goals for expanded coverage and enrollment. Ms. Díaz Tafur reported that 700,000 spaces had been generated just through improved alignment of students and current schools with the capacity to accommodate new students (Juana Inés Díaz Tafur, personal communication, August 3, 2006). Through the Revolución, the MEN expects to increase coverage by 10% through efficiency alone.

ICT: Programa Nacional de Nuevas Tecnologias

As noted above, ICT has helped Colombia meet its enrollment goals and enhance the efficiency of its education system. Yet, the MEN's concept of ICT integration goes far beyond a focus on achieving a single goal or addressing just one challenge. Instead, the MEN views ICT as a strategic thread that connects all of the efforts of the Revolución Educativa. As the centerpiece of many new models of teaching and learning that encourage students to explore and build their knowledge through the productive use of technology, ICT is especially important to the Revolución's quality improvement strategies.

In an interview, Javier Orlando Torres Paez, Jefe Oficina de Informatica said that, "In the Revolución, there are five strategic projects that explicitly use information technology. These are basically:

- Program for the use of new technologies in teaching
- Strengthening the use of ICT in Higher Education
- Creation of a national information management system
- Modernization of the MEN
- Modernization of the secretariats"[34] (Javier Orlando Torres Paez, personal communication, August 3, 2006)

The starting point for Colombia's Programa Nacional de Nuevas Tecnologías (New Technologies Plan) is the perspective that ICT by itself will not improve learning. A change in quality will only come about if technology is integrated into schools along with a deep understanding among teachers of how these new resources should be used. The Programa de Nuevas Tecnologías has three axes: access to infrastructure, access to quality content, and educational use and adoption of ICT.

---

[33] Original quote follows: "En educación básica, el rol (del sistema de información) es simplemente apoyar la gestión de cobertura, para poder tomar decisiones de donde vamos a ampliar cobertura, donde hay niños desatendidos."

[34] Original quote follows: "En la revolución educativa hay 5 proyectos estratégicos en los cuales hay temas explícitos de apoyo de la tecnología de información. Que son básicamente, la modernización del ministerio de educación, la modernización de las secretarias, el fortalecimiento del uso de la tecnología en el nivel superior, el programa de uso de nuevas tecnologías en pedagogía, en tecnologías educativas y la creación de todo un sistema nacional de información que hace parte de los lineamientos que quedaron en la ley 715."

The first axis of the Programa de Nuevas Tecnologías, the provision of ICT infrastructure, is supported through various initiatives in coordination with the Agenda de Conectividad (mentioned above). The secretariats and municipalities have their own initiatives to equip schools in their regions. But the major national initiative is through the public foundation, Computadoras para Educar (Computers for Education: CPE). CPE is an association of three public entities: the MEN, the Fondo de Comunicaciones (Communication Fund), and the Servicio Nacional de Aprendizaje (National Service for Learning) that reconditions old computers donated by private firms that are then distributed to schools. CPE also provides technical support and teacher training. According to their own statistics, CPE has distributed over 60,000 computers to 6,600 schools.[35]

The second axis of the PND is represented by a number of activities. One of these, Colombia's educational portal, Colombia Aprende (Colombia Learns) (www.colombiaaprende.edu.co), offers resources—including collaborative projects, school texts, and images—to teachers, students, and the community. Colombia also has a new educational television initiative, SeñalColombia (ColombiaSignal), which seeks to provide improved audiovisual resources to schools. In addition, within the activities of the Sub-dirección de Mejoramiento (Sub-Directorate for School Improvement) there is a special project targeting media literacy and the use of new media resources. Mónica López, the MEN Sub-directora de Mejoramiento, commented that to support and expand the work being done around computers in the classroom, the MEN also encourages teachers to think about a broader set of resources like libraries, digital libraries, and television. The Intel® Teach professional development programs are seen as an example of the possible interconnections because it helps teachers think about how to integrate these new resources into their classrooms.

The third axis of the Programa de Nuevas Tecnologías, supporting appropriate educational uses, is directly related to efforts to improve quality. Cecilia María Vélez White, Ministra de Educación Nacional de Colombia (Minister of Education), believes that part of her role is to be an "evangelizer" for ICT in the schools. Her goal of changing the daily teaching practices of 300,000 in-service educators with little prior exposure to ICT will require a "paradigm change" in how these teachers see their role in the classroom.[36] To achieve this goal, the MEN offers a number of professional development programs, including a comprehensive program sponsored by Intel® (see **page 14** for more information about professional development).

ICT also plays two important supporting roles for the Ciclo de Calidad described above. First, as noted earlier, ICT-based information management systems provide an easy flow of information that allows leaders at all levels to create improvement plans and to evaluate their progress. The transparency of information also increases accountability since parents, the community, and the MEN all have access to information about students' and schools' performance. Second, ICT also facilitates the communication and sharing that is

[35] Computadoras para Educar. (2006). Programa Computadores para Educar. Bogotá: Author.
[36] Velez White, C. M. (2006). *Rueda de Prensa Proyecto Conectividad Instituciones Públicas*. Bogotá: Ministerio de Educación Nacional.

fundamental for the MEN personnel to shift from mandating policy to supporting and advising the local educational authorities in a process of change.

Changing the Educational Paradigm and the Curriculum

A central quality component of the Revolución Educativa is its focus on curricula. During the reform attempts of the 1990s described above, leaders debated the goals of Colombian education for the first time.[37] As part of the strong public debate called the Movimiento Nacional Pedagógico (National Pedagogical Movement), these discussions prompted the country to begin to move away from rigid and technocratic approaches; more open curricular guidelines targeting intellectual competencies, not only content memorization, began to be valued.[38] However, as noted previously, these efforts resulted in little change to what teachers were teaching and how students were learning. Efforts at effective curricular reform stalled amongst the complexities of decentralization[39] and a focus on curricular reform processes rather than producing an actual curriculum.[40]

A reassessment of the state of education conducted under the current Ministra de Educación Nacional, Cecilia María Vélez White, culminated in 2002. Ferrer[41] considers that the government's impetus was not to redesign Colombian education, despite the term Revolución Educativa, but to provide schools with more effective guidance in developing and improving educational practice within the curricular guidelines already established. An assessment of Colombia's national curricular guidelines characterized them as overly "rhetorical," or theoretical, and lacking in the precision necessary to guide schools in making practical decisions.[42] Transforming the curriculum to be more student-centered and to support learning through exploration and discovery is not just part of a twenty-first century education, it is fundamental to the effective use of ICT. Most research suggests that ICT is most effective in supporting and improving students' learning when used to support constructivist teaching and learning.[43]

The ministry's efforts led to a reevaluation of the country's curricular frameworks and resulted in a number of concrete changes. In a process called the Expedición Pedagógica Nacional (National Pedagogical Expedition), in which teams of educators visited schools

---

[37] Cajiao, F. (2004). La concertación de la educación en Colombia *Revista Iberoamericana de Educación, 34*, 31-47.

[38] Dussel, I. (2006). Curricular reform in Latin America: Assessment and future prospects, *Segunda Reunión del Comité Intergubernamental del Proyecto Regional de Educación para América Latina y el Caribe (PRELAC)*. Santiago de Chile: UNESCO.

[39] Cajiao, F. (2004). La concertación de la educación en Colombia *Revista Iberoamericana de Educación, 34*, 31-47, Tedesco, J. C. (2000). *Educar en la sociedad del conocimiento*. Buenos Aires: Fondo de Cultura Económica.

[40] Ferrer, G. (2004). *Las reformas curriculares de Perú, Colombia, Chile y Argentina: ¿Quién responde por los resultados?* Lima: Grupo de Análisis para el Desarrollo (GRADE).

[41] Ibid.

[42] Ibid.

[43] Kozma, R. (2005). National policies that connect ICT-based education reform to economic and social development. *Human Technology, 1*(2), 117-156, Lemke, C. (2006). *Technoloy in schools: What the research says*. Culver City, CA: CISCO Systems, Webb, M., & Cox, M. (2004). A Review of pedagogy related to information and communications technology. *Technology, Pedagogy and Education, 13*(3), 235-286.

around the country, the MEN played a role as facilitator of a national conversation among educators to redefine the curriculum and the expected student outcomes.[44] Three official resolutions, Decree 230–2002, Curricular Alignment, and Achievement Indicators for General Curriculum, contain the government's redefined guidelines. Two broad changes were made. First, the curricular content was divided into year-long segments and spread across different grades. The previous guidelines had only identified the content to be taught within multiyear cycles. The new scope and sequence was eminently more practical for the type of planning that school principals and teachers typically do. Given the new importance of school improvement plans, the increased coherency and practicality of the guidelines may prove to be a powerful change.

Second, the MEN identified basic competencies and student performance assessments to anchor the curriculum in concrete, measurable outcomes. The MEN established three sets of standards: basic competencies in subject areas (mathematics, language, social sciences and natural sciences[45]), citizenship competencies, and work-related competencies. The standards are designed to turn the curricular guidelines into a clearer prescription of what students need to know and be able to do at each grade in school. These are widely shared criteria that serve as a reference to public official educational leaders and teachers about what constitutes a quality education.

Within this framework, the regional authorities and each school design their own curricula or Planes de Estudio (course of study). According to Mónica López, the MEN Sub-directora de Mejoramiento, "… the competencies indicate to the teacher what they should expect the students to be able to do with the skills acquired at each level of the education system" (Mónica López, personal communication, August 3, 2006). The desire is to move educators away from a traditional, rigid curriculum that is broken done into disaggregated facts that students memorize towards giving students the skills and processes they need to find, choose, analyze, synthesize, and apply knowledge.

Pedagogical Reform, Improving Teaching, and Professional Development

In the Revolución Educativa, teachers must take the lead in implementing many of the reform efforts. The new competencies and curricular goals require teachers to change their practices and improve their content knowledge. The integration of ICT requires new approaches. Even the school improvement plans have created new expectations for teachers.

In 2002, the first step in changing teachers' roles and status was taken with the creation of a *Nuevo Estatuto de Profesionalización Docente* (new statute for teachers). This statute transformed the career ladder and increased teachers' salaries to reward a teacher's skills, qualifications, and work. Simultaneously, the MEN began to promote the introduction of a new teaching paradigm that complements its vision for a twenty-first century education

[44] Dussel, I. (2006). Curricular reform in Latin America: Assessment and future prospects, *Segunda Reunión del Comité Intergubernamental del Proyecto Regional de Educación para América Latina y el Caribe (PRELAC)*. Santiago de Chile: UNESCO.

[45] See the example: Ministerio de Educación Nacional. (2004a). *Formar en ciencias: ¡el desafío!: Lo que necesitamos saber y saber hacer* (No. 7). Bogotá: Author.

system. The new paradigm emphasizes teachers' mastery of their discipline and stresses the need for teachers to foster their students' development of critical thinking skills.

In addition to changing its requirements for new teachers, the MEN assessed the needs of in-service teachers and administrators in order to revise and expand its professional development opportunities. In 2003, the MEN conducted the first national evaluation of teachers' and school principals' performance. The results were generally good, but identified a need for improvements in teachers' knowledge of new pedagogical strategies.[46] This finding was in keeping with the literature on education reform, which highlights training and professional development of teachers as a priority for any attempt to modernize.[47]

The MEN's professional development programs are designed to introduce new ways of teaching, as well as to orient teachers to innovative ICT tools that support student learning. Claudia Zea, Asesora de nuevas tecnologías (Special Advisor on New Technologies) to the MEN, has created a range of ICT-focused professional development opportunities that support teachers in the movement from no ICT skills to a deeper understanding of how to integrate ICT into an innovative, student-centered learning environment. In an interview, she described two programs that the MEN uses to support teachers' acquisition and application of ICT knowledge. "A que te cojo ratón" ("I am going to get you, Mouse") guides novice ICT users in developing basic skills, and, for more advanced users, the MEN offers Intel® Educar Curso Esencial (Intel® Teach Essentials Course)—a course that engages teachers in creating their own ICT-rich learning units for student projects (Claudia Zea, personal communication, August 2, 2006). The MEN selected Intel Educar because it supports two goals: teachers' and students' use of ICT and promotion of its new teaching paradigm. Intel Educar centers on a discussion of the pedagogical importance and utility of ICT in inquiry-driven, student-centered learning environments while teachers create their own materials.[48] The course was also adapted and expanded to support the MEN's efforts through the introduction of a module on school improvement plans.

The content of Intel® Educar serves to reinforce the broader efforts of the Revolución Educativa in other ways. According to Mónica López, Sub-Directora de Mejoramiento, an important objective of the MEN is that all professional development opportunities "… serve to strengthen the institution as a whole, and not only the teacher" (Mónica López, personal communication, August 3, 2006). Intel® Educar meets this objective by engaging cohorts of teachers from the same school in the course, reinforcing each school's sense of itself as a community of learners and professionals. In Ms. Zea's view, the course also supports teachers' development of lesson planning skills and covers the use of innovative and holistic assessment strategies for students (Claudia Zea, personal communication, August 2, 2006).

---

[46] Programa de Promoción de la Reforma Educativa en América Latina y el Caribe. (2006). *Informe de Progreso Educativo de Colombia: Hay avances, pero quedan desafíos*. Bogotá: Author.

[47] Kozma, R. (2005). National policies that connect ICT-based education reform to economic and social development. *Human Technology, 1*(2), 117-156.

[48] Light, D., McMillan Culp, K., Menon, R., & Shulman, S. (2006). *Preparing teachers for the 21st Century classroom: Current findings from evaluations of the Intel Teach to the Future Essentials Course.* New York: EDC/Center for Children and Technology.

Assessment System

In addition to instituting new forms of professional development and approaches to curricula, the MEN identified the need to modify its national assessment strategy. The MEN had several reasons for revising the assessment system. First, the MEN needed a transparent accountability system that would serve to keep all of the players accountable. A decentralized system needs an external, objective accountability structure to drive the improvement process and to assure that all players know whether the system is meeting the needs of students. Second, the new curricula and standards promote the mastery of complex content and competencies that previous standardized exams did not measure. If the new system is increasingly holding educators accountable, that accountability needs to be connected to the desired outcomes. Third, assessment is an important aspect of quality teaching since it lets teachers know where their students are in their learning, who is struggling, and who is excelling.

The ministry has promoted a variety of assessment strategies connected to the Ciclo de Calidad and school improvement plans described earlier. While the MEN has dedicated substantial effort to establishing a national standardized test of student academic achievement, the ministry has also promoted the use of innovative classroom assessment strategies to enable teachers to easily gather information on their students' progress. The MEN is encouraging teachers to continuously assess student learning with strategies like having students explain their thinking, or using rubrics to holistically evaluate students work. The expectation is for teachers to evaluate the entire learning process, not just learning outcomes, so that they can support students more effectively. To help achieve this goal, the MEN expects assessment to be woven into all professional development opportunities when appropriate (e.g., Intel® Educar includes the use of rubric assessments to evaluate student-made ICT products).

In the past, the MEN conducted its own national assessments by administering a standardized test to a sample of schools and grades to assess the quality of the overall system. However, the MEN did not have a common evaluation to assess the academic achievement of all students at important points in their education. This has changed under the provisions of the Revolución Educativa, and Colombia has instituted a *censual* testing system—the SABER exams—to evaluate all students in the fifth and ninth grades.[49] An independent institution, Instituto Colombiano para el Fomento de la Educación Superior (ICFES) (Colombian Institute for the Development of Higher Education) is responsible for developing the SABER assessments that measure basic subject area competencies in mathematics, language, and the social and natural sciences. Results from the assessments enable local and national leaders to make comparisons between the regional and national level and to track schools' progress. In 2007, an assessment of twenty-first century work-related competencies is still in development.

The SABER exams play a key role in connecting school improvement plans with actual school performance. Each institution uses the yearly SABER results (along with other data) to analyze its situation and identify need for improvement. This analysis is the basic input

[49] Ministerio de Educación Nacional. (2003). *¿Cómo entender las Pruebas SABER y qué sigue?* (No. 2). Bogotá: Author.

for devising plans of institutional improvement that address administrative and academic management procedures as well as regulations that rule relationships within the academic community. The following year's exam results let the school assess its progress and revise or change its plans accordingly.

CONCLUSION

The policies of Colombia's Revolución Educativa address the five dimensions of education reform identified by researchers as most important to systemic change—curriculum, pedagogy, assessment, teacher professional development, and school organization.[50] The Revolución's approach is comprehensive and coordinated; none of its policies exists in isolation, and all of its strategies are designed to work in unison to strengthen the system as a whole. Curriculum reform, which attempts to support deeper learning with a focus on competencies and skills, is supported by changes to traditional models of teaching and by changes in the assessment process. New accountability and assessment policies, which target the new competencies, also serve to drive changes in teaching and school improvement. Simultaneously, well-aligned professional development programs and improvements in teachers' working conditions build the capacity of the teaching workforce to thrive in the new system. A shift in school organization towards decentralization empowers teachers and schools to take ownership over the reform process. The MEN, in its new role as facilitator of these changes, aids implementation by providing more support to local authorities and by offering professional development programs.

ICT plays an important role within this broad reform effort. From a central organizational level, the creation of an effective information management system clarified issues of accountability and optimal use of resources. This new system supports the alignment of efforts and activities with actual educational challenges and helps focus policy discussions on how to improve student performance. ICT also serves to enhance the entire education system by facilitating communication among different levels of the system and improving the accessibility of teacher professional development. Perhaps most importantly, ICT plays a central role in the evolution of Colombia's new paradigm of teaching and learning. The MEN in Colombia conceives of ICT as central to student-centered learning and believes that harnessing its productive potential will enrich students' school experiences—enabling them to explore topics, conduct research, and create their own knowledge in new ways.

REFERENCES

Astiz, M. F., Wiseman, A. W., & Baker, D. P. (2002). Slouching towards decentralization: Consequences of globalization for curricular control in national education systems. *Comparative Education Review, 46*(1), 66-88.

[50] Hepp, P., Hinostroza, J. E., Laval, E., & Rehbein, L. (2004). *Technology in schools: Education, ICT and the knowledge society*. Washington, DC: World Bank, Kozma, R. (2005). National policies that connect ICT-based education reform to economic and social development. *Human Technology, 1*(2), 117-156, Osín, L. (2000). Dimensiones de cambio en los sistemas educativos de América Latina: América Central en el contexto de políticas de educación en las Américas. In J. C. Navarro, K. Taylor, A. Bernasconi & L. Tyler (Eds.), *Perspectivas sobre la reforma educativa* (pp. 129-146). Washington, DC: Inter-American Development Bank.

Borjas, G., & Acosta, O. L. (2000). *Education reform in Colombia.* Bogotá: Fedesarollo.
Cajiao, F. (2004). La concertación de la educación en Colombia *Revista Iberoamericana de Educación, 34*, 31-47.
Computadoras para Educar. (2006). Programa Computadores para Educar. Bogotá: Author.
Corrales, J. (1999). *Aspectos políticos en la implementación de las reformas educativas*. Washington DC: Programa de Promoción de la Reforma Educativa en América Latina y el Caribe.
Departamento Nacional Planeación. (2003). *Plan Nacional de Desarrollo 2002-2006, Hacia un Estado Comunitario* (No. 8025-43-5). Bogotá.
Dussel, I. (2006). Curricular reform in Latin America: Assessment and future prospects, *Segunda Reunión del Comité Intergubernamental del Proyecto Regional de Educación para América Latina y el Caribe (PRELAC)*. Santiago de Chile: UNESCO.
Ferrer, G. (2004). *Las reformas curriculares de Perú, Colombia, Chile y Argentina: ¿Quién responde por los resultados?* Lima: Grupo de Análisis para el Desarrollo (GRADE).
Gajardo, M. (1999). *Reformas educativas en América Latina: Balance de una década.* Santiago: Programa de Promoción de la Reforma Educativa en América Latina (PREAL).
Hepp, P., Hinostroza, J. E., Laval, E., & Rehbein, L. (2004). *Technology in schools: Education, ICT and the knowledge society*. Washington, DC: World Bank.
Honey, M. (2006). Background. In Board on Science Education (Ed.), *ICT Fluency and High Schools: A Workshop Summary*. Washington D.C.: The National Academies Press.
Instituto Colombiano para el Fomento de la Educación Superior. *Exámen de Estado para Ingreso a la Educación Superior*. Retrieved October 2006, from http://200.14.205.63:8080/portalicfes/home_2/rec/arc_340.pdf
Instituto Colombiano para el Fomento de la Educación Superior. *Programa de Evaluación de la Educación Básica – Pruebas SABER*. Retrieved October 2006, from http://200.14.205.63:8080/portalicfes/home_2/rec/arc_593.pdf
Kaufman, R. R., & Nelson, J. M. (2005). *Políticas de reforma educativa comparación entre países*. Santiago: Programa de Promoción de la Reforma Educativa en América .Latina (PREAL).
Kozma, R. (2005). National policies that connect ICT-based education reform to economic and social development. *Human Technology, 1*(2), 117-156.
Lee, J. (2001). School reform initiatives as balancing acts: Policy variation and educational convergence among Japan, Korea, England and the United States. *Education Policy Analysis Archive, 9*(13), 11.
Lemke, C. (2006). *Technoloy in schools: What the research says*. Culver City, CA: CISCO Systems.
Light, D., McMillan Culp, K., Menon, R., & Shulman, S. (2006). *Preparing teachers for the 21st Century classroom: Current findings from evaluations of the Intel Teach to the Future Essentials Course*. New York: EDC/Center for Children and Technology.
Martinic, S. (2001). Conflictos políticos e interacciones comunicativas en las reformas educativas en América Latina. *Revista Iberoamericana de Educación, 27*, 17-33.
Ministerio de Educación Nacional. (2002). *Plan Sectorial 2002-2006*. Bogotá: Author.
Ministerio de Educación Nacional. (2003). *¿Cómo entender las Pruebas SABER y qué sigue?* (No. 2). Bogotá: Author.

Ministerio de Educación Nacional. (2004a). *Formar en ciencias: ¡el desafío!: Lo que necesitamos saber y saber hacer* (No. 7). Bogotá: Author.

Ministerio de Educación Nacional. (2004b). *Planes de Mejoramiento: y ahora ¿Cómo mejoramos?* (No. 5). Bogotá: Author.

NESTA Futurelab. (2004). *I-Curriculum Project* Retrieved October, 25, 2006, from http://promitheas.iacm.forth.gr/i-curriculum/index.html

Osín, L. (2000). Dimensiones de cambio en los sistemas educativos de América Latina: América Central en el contexto de políticas de educación en las Américas. In J. C. Navarro, K. Taylor, A. Bernasconi & L. Tyler (Eds.), *Perspectivas sobre la reforma educativa* (pp. 129-146). Washington, DC: Inter-American Development Bank.

Programa de Promoción de la Reforma Educativa en América Latina y el Caribe. (2006). *Informe de Progreso Educativo de Colombia: Hay avances, pero quedan desafíos*. Bogotá: Author.

Stiglitz, J. (2002). *Globalization and its Discontents*. New York: Norton.

Tedesco, J. C. (2000). *Educar en la sociedad del conocimiento*. Buenos Aires: Fondo de Cultura Económica.

Velez White, C. M. (2006). *Rueda de Prensa Proyecto Conectividad Instituciones Públicas*. Bogotá: Ministerio de Educación Nacional.

Webb, M., & Cox, M. (2004). A Review of pedagogy related to information and communications technology. *Technology, Pedagogy and Education, 13*(3), 235-286.