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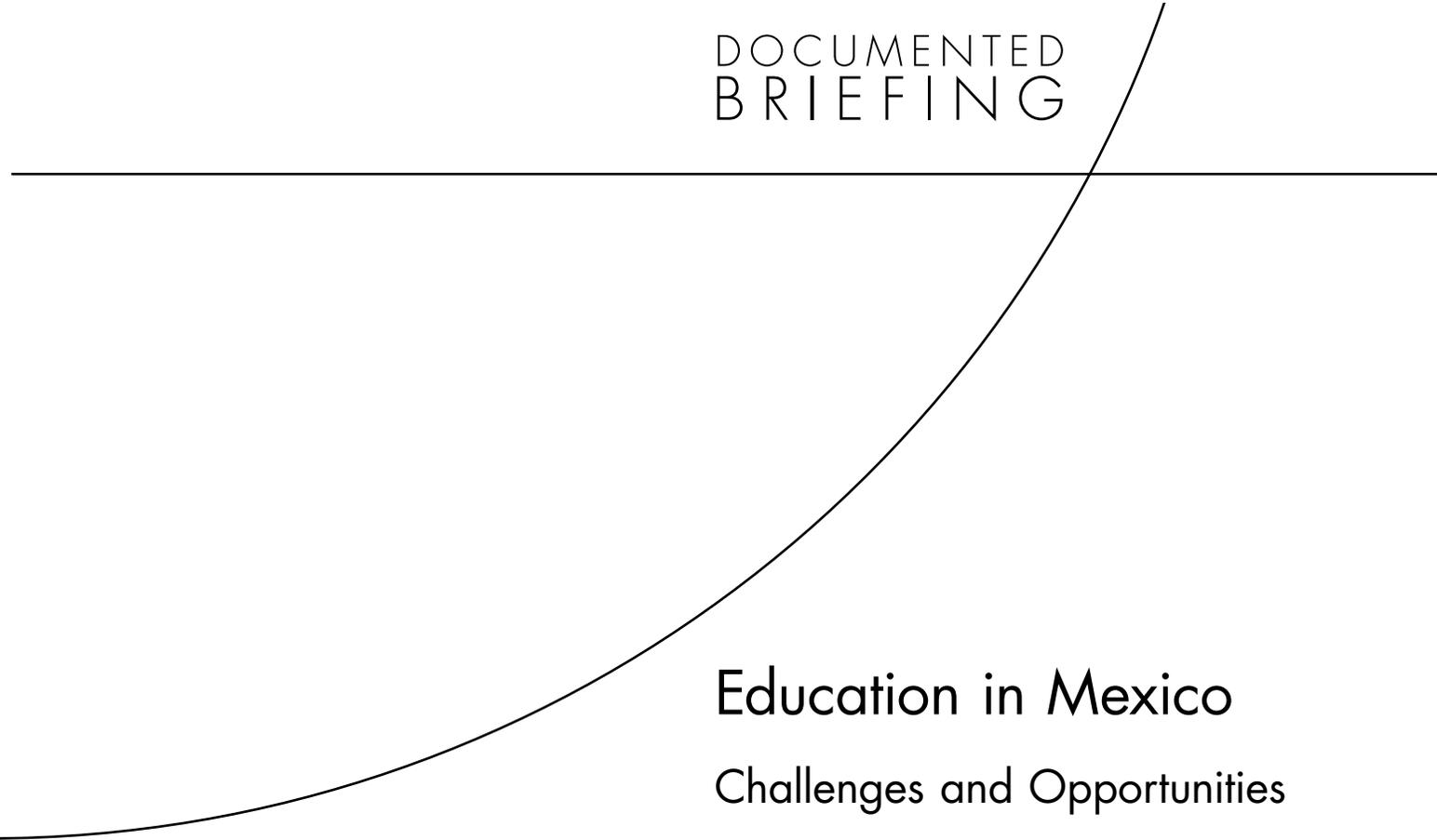
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DOCUMENTED
BRIEFING



Education in Mexico

Challenges and Opportunities

Lucrecia Santibañez, Georges Vernez, Paula Razquin

Sponsored by The William and Flora Hewlett Foundation



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The research described in this report was sponsored by The William and Flora Hewlett Foundation and was conducted within RAND Education.

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PREFACE

In 2004, The William and Flora Hewlett Foundation approached the RAND Corporation to assess opportunities for the foundation in Mexican education. The foundation was interested in finding ways to invest and have an impact on education policy in that country, but was concerned that there might not be opportunities, or that there might be barriers for a U.S.-based foundation to engage in education policy work in Mexico.

This project was intended to provide The William and Flora Hewlett Foundation with background and contextual information on the K–12 education system in Mexico and to identify the main issues and the challenges associated with them. The results of this project should be of interest to foundation program officers at the foundation’s headquarters as well as its Mexico City office.

This research was sponsored by The William and Flora Hewlett Foundation and was conducted within RAND Education, a research unit within the RAND Corporation. This research reflects RAND Education’s mission to bring accurate data and careful, objective analysis to the international debate on education policy. Comments are welcome and should be sent to Lucrecia Santibañez (phone 310-393-0411, ext. 6057, email Lucrecia_Santibanez@rand.org) and Georges Vernez (phone 310-393-0411, ext. 6211, email Georges_Vernez@rand.org).

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SUMMARY

This documented briefing reports on research designed to assist The William and Flora Hewlett Foundation to identify opportunities for investment in Mexican education. The goal of this study is to provide the foundation with background and contextual information on the K–12 education system in Mexico. It highlights the main educational issues in the country and the challenges associated with them, and identifies opportunities for Hewlett in Mexican education.

This project followed a three-tiered approach. First, to describe the current status of the educational system in Mexico, we commissioned a background paper from Valora S.A., a private education-consulting firm based in Mexico City. Second, we conducted a literature review of recent education research. Third, we identified and interviewed several key stakeholders in education in both the government and private sectors. These stakeholders were located in Mexico City and three selected states: Jalisco, Nuevo León, and Aguascalientes. These three states were selected because they have large and highly reputed universities engaged in education research, have built strong academic communities in education, and have recently elected governments that are currently in the process of setting up educational priorities for the state.

Mexico's Education System

The Mexican education system is organized into four levels: preschool (K1–K3), compulsory basic education (grades 1–9), upper secondary education (grades 10–12), and higher education. The government is only officially responsible for providing compulsory basic education, although it is also involved at the other three levels through public provision of preschool and upper secondary as well as public funding of higher education in most states. Public schools serve 87 percent of all students in the country. Governance is centralized as the national level with the *Secretaría de Educación* (SEP)—setting the curriculum, selecting textbooks, hiring and firing school personnel, and setting salary schedules. Although Mexico decentralized the basic education system to its 32 states in 1992, this reform was mostly administrative, and did not diminish the centralization of decisionmaking. Overall, teachers and school administrators have little autonomy in the system.

Mexico's public spending on education amounts to 5.9 percent of gross domestic product (GDP) per capita, above the Organization for Economic Co-operation and Development (OECD) average of 5.6 percent. The government currently spends about \$28 billion yearly on education, almost a quarter of its programmable budget. On average, states fund 85 percent of education spending through federal transfers.

The Ministry of Education (SEP) and the teachers' union (SNTE) are the two main actors in the education policy arena. International organizations such as The World Bank and the Inter-American Development Bank also have a major and longstanding presence in Mexican education. Even though only a very small fraction (from 1 to 5 percent) of

Mexico's educational budget is provided by such lending agencies, their influence on policies and educational reform is considerable and tied to large loans given to the Mexican government. Private foundation work (national and international) is not wide-ranging and business organizations in particular play a very limited role. Although parent groups are growing in popularity and influence, they still play a very limited role.

Key issues in Mexican education have to do with insufficient enrollments and high dropout rates beyond the primary level, insufficient supply of upper secondary schools (particularly in rural areas), and low student achievement levels. At the national and state levels, problematic issues include teacher training and a lack of research and evaluation that can inform school improvement efforts.

There are four major national government programs aimed at alleviating some of the issues outlined above. *Oportunidades* (formerly known as PROGRESA) provides cash grants to low-income families so that their children can attend school and health services. *Enciclomedia* digitalizes the school curriculum into CD-ROMs so students can learn interactively with the aid of computers. *Programa Escuelas de Calidad*, or quality schools program, targets low performing schools. Schools must consent to implement a school wide reform project; in exchange they receive grants of up to \$10,000 to be used mainly for infrastructure improvements. Last, for over 10 years, SEP has had in place a wide range of compensatory programs aimed at improving school infrastructure, equipment, and materials, and providing incentives to teachers and school principals in order to decrease teacher absenteeism and improve school supervision functions.

Enrollment and Educational Performance

Basic education enrollments grew considerably between 1970 and 2000 from 9.7 million students in 1970, to 21.6 million students in 2000. This rapid growth in demand for basic education was primarily met through double shifting of schools and teachers and the provision of distance learning models in lower secondary schools (grades 7–9). Currently, the entire system (kindergarten, basic education, upper secondary, and higher education) enrolls close to 31 million students.

Enrollment varies by level.¹ Enrollment of children of primary school age is high in basic education (grades 1–9), which includes primary and lower secondary, although it varies by level. It is very high in primary schools (grades 1–6) (93 percent), but lower in lower secondary schools (grades 7–9) (86 percent of schedules of lower secondary school age). Enrollment is particularly low in preschool (56 percent) and upper secondary schools (51 percent). These enrollment rates mean that out of every 100 students entering the first grade of primary school in Mexico, around 68 of them will complete all nine years of basic education. Thirty-five of these will go on to graduate from upper secondary. And only slightly more than 8 percent of the population aged 18 and older in Mexico holds a bachelor's degree.

¹ Enrollment is defined as the proportion of total enrollment in a particular level over the number of students in a specific age group.

Educational attainment and achievement levels in Mexico are generally low, although they have improved greatly in the past 10 years. In 2003, average educational attainment of the population aged 15 and older was 7.9 years; in 1993 it was 6.8 years. During the 1990s, Mexico has applied national examinations to its students to test for subject competency. Results published in 2003 by the *Instituto Nacional para la Evaluación Educativa* (INEE) revealed that 45 percent and 15 percent of sixth graders in urban primary schools achieved satisfactory or above satisfactory competency in reading and math, respectively. Results for sixth graders in rural and indigenous primary schools were even lower. Only 76 percent and 50 percent of ninth graders in secondary schools achieved satisfactory or above satisfactory competency in reading and math, respectively. Results were lower for students in technical and distance lower secondary schools. Mexico has not fared very well in recent international examinations. On the Third International Mathematics and Science Study (TIMSS) conducted in 1995, Mexican students placed last or second to last among a group of countries that included mostly developed nations. Even in Latin America, Mexican student-performance is among the lowest.

Status of Education Research in Mexico

Education research and evaluation in Mexico is scant. The Mexican education system lacks transparency and has no tradition of supporting objective evaluations. The Ministry of Education conducts a fair amount of research but for its own internal purposes, subcontracting most of it to academic or national research centers. Education researchers in Mexico favor qualitative approaches. Large-scale data are difficult to access, which has limited the development of quantitative research in the country. Although SEP collects a wealth of information on schools and students, it rarely makes it publicly available. Another reason for insufficient high-quality education research and evaluation in Mexico is the low research capacity in the system. In 2002, Mexico graduated a total of 1,250 Ph.D. students in *all* disciplines; 140 of these obtained doctorates in education and the humanities. As a comparison, in 2002, U.S. institutions of higher education awarded 6,700 Ph.D. degrees in education alone. Even if we adjust for differences in population size, the disparities are large. On a per-capita basis, Mexico graduated 1.4 education Ph.D.'s per every million inhabitants, while the United States graduated about 22. In addition, few graduate programs in education in Mexico are considered to be high-quality.

Opportunities for The William and Flora Hewlett Foundation

We considered three factors in assessing opportunities for Hewlett's involvement in Mexico's education: the potential for long-term national impact; the level of investments that may be required, and the foundation's long-standing history in supporting policy and evaluative research.

We concluded that the most promising prospect for Hewlett would be in helping to build Mexico's institutional capabilities to develop a broader understanding (and public transparency) of the Mexican education system and provide empirically supported feedback on existing programs and policies. Such a focus would provide for making

gradual, but cumulative, large or small investments and an opportunity for Hewlett staff to develop relationships with key actors without whose cooperation little can be accomplished. It also offers the prospect for having a long-term national impact and over time may open the door for supporting programmatic investments.

Overall, we consider that there are few, if any, immediate programmatic opportunities for the foundation at either the national or the state level. At the national level, the government is currently engaged in developing and implementing large-scale initiatives designed to address the key coverage and student achievement issues we identified. Any efforts on the part of the foundation in this area would require developing trusting relationships with the Ministry of Education and the Union—a slow endeavor—and eventual large, and possibly risky, investments in order to have a real effect. At the state level, programmatic initiatives tend to be opportunistic and short-lived and similarly would require large investments of time by foundation staff to develop the contacts and relationships that would allow for opening up opportunities.

Should the foundation choose to get involved in building Mexico's institutional capabilities for policy and evaluative research, it can do so by engaging in one or more of the following activities: (1) helping establish a policy research center; (2) supporting public and academic forums on specific issues; (3) helping develop centralized access to education research and data; (4) funding system-wide descriptive studies; and (5) funding objective evaluations of ongoing school reform initiatives.

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Catherine Augustine at RAND and Nancy Kendall at Florida State University reviewed this briefing for quality assurance. We are grateful for their suggestions and comments. Last, we appreciate the excellent secretarial and administrative assistance provided by Julie McNall and Lizeth Bejarano throughout the duration of the project.

1. INTRODUCTION



EDUCATION

Education in Mexico: Challenges and Opportunities

**Annotated Briefing to
The William and Flora Hewlett Foundation**

**RAND
December, 2004**

In February of 2004, The William and Flora Hewlett Foundation approached RAND to explore opportunities for the foundation to become involved in education activities in Mexico. From March to October of 2004, RAND carried out research to investigate the roles that the foundation might most effectively play in the Mexican educational policy arena. The results of this research are contained in this documented briefing.

Study's Objectives

- ▣ To provide background information on the education system in Mexico**
- ▣ To identify the main issues as well as the challenges associated with them**
- ▣ To recommend potential opportunities for the Foundation in education in Mexico**

RAND

Our objectives were: (1) to provide The William and Flora Hewlett Foundation with an overview of the structure, governance, and performance of Mexico's education system; (2) to identify the main educational issues in the country; and (3) to recommend potential opportunities for The William and Flora Hewlett Foundation in Mexican education.

Approach

- ▣ **Described and assessed the performance of Mexico's education system**
- ▣ **Reviewed and assessed recent research on Mexico's education**
- ▣ **Interviewed key actors in education**
 - Interviewed education officials, policymakers, and researchers in Mexico City, Aguascalientes, Jalisco, and Nuevo León

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To address these objectives, we commissioned a background paper from Valora S.A., a private education-consulting firm based in Mexico City. An abridged version of this paper is included as Appendix A. It describes Mexico's education system and provides some basic statistics. We then conducted a literature review of recent education research. This review, included as Appendix B, was limited to documents that were published no more than five years ago in Mexico or the United States, in English or Spanish. We also reviewed documents and reports published by large international organizations such as the World Bank and the Inter-American Development Bank.

Third, we conducted a series of interviews with key actors in Mexican education. Findings from these interviews were used to identify potential opportunities for Hewlett at both the national and state levels. To ensure that our interviews covered a wide range of viewpoints and contexts, we selected three states for visits, in addition to Mexico City. In all interviews the objective was to gather information on key issues facing the education system at the national and state levels, perceived policy priorities to improve education, and the capacity for educational research to drive decisionmaking in the education sector.

The states were selected based on three criteria: (1) existence of an education research community or established education program in its higher education system; (2) recently elected state government (so that current policy directions and priorities would be kept in the short- to medium-term); and (3) reputation for innovative education research and/or state-level reforms. Using these three criteria, we selected Aguascalientes, Jalisco, and Nuevo León. Aguascalientes is a small, middle-income state located in central Mexico. It has one medium-sized public university with a well-established education department. Jalisco, located in the Southwest, is one of the largest states in Mexico. It is a relatively high-income and diverse state with industrial towns, very rural areas, and indigenous

communities in the High Sierras. Its state public university is the second largest in the country, after the *Universidad Nacional Autónoma de México* (UNAM), and has a large education program. Last, Nuevo León is a wealthy, industrial state in Mexico. Located in northern Mexico and sharing a border with Texas, it has one very large private university, considered to be among the best in the country.

2. STATUS OF MEXICO'S EDUCATION

Briefing Outline

- ▣ **Status of Mexico's Education**
 - **Organization and governance**
 - **Funding**
 - **Coverage and performance**
 - **Key actors**
 - **Key issues and programs that address them**
- ▣ **Research on Education**
- ▣ **Opportunities for Hewlett**

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Below, we provide an overview of Mexico's education system, including its organization, governance, funding, coverage and performance. In addition, we provide an overview of the main constituents in the Mexican education sector. Second, we will discuss our finding with regard to the status of research on Mexican education. Opportunities for The William and Flora Hewlett Foundation's engagement in the area of education in Mexico are discussed last.

Organization and Governance

Mexico's Education Has Four Main Levels...

▣ **Preschool (ages 3-5) - 4 Million students**

▣ **Compulsory Basic Education**

- Primary (grades 1-6) – 15 million
 - General (93%)
 - Community and Indigenous (7%)
- Lower Secondary (grades 7-9) – 5.8 million
 - General (51%)
 - Technical (29%)
 - Distance (20%)

↻ *One in four schools in the country is multi-grade*

▣ **Upper Secondary Education (grades 10-12) - 3.5 Million**

▣ **Higher Education - 2.5 Million**

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The Mexican education system is organized into four levels: preschool, compulsory basic education, upper secondary education, and higher education. The government is officially responsible for providing compulsory basic education only, although it is also involved at the other three levels. As a whole, the system enrolls close to 31 million students or about 86 percent of the population aged three to 25.

Preschool

Preschool provides early education for children aged three to five. Currently, it enrolls about four million students in this age group or about 56 percent of the relevant age group. Recently, Mexico passed a new reform that will make preschool a compulsory part of the country's basic education system. It is hoped that this new law will increase coverage in this sector and help improve educational attainment and achievement of newly entering cohorts.

Basic Education

Basic education includes grades 1-9. The first six grades make up primary education, and enroll 15 million students, 93 percent of the relevant age population. Grades 7-9 make up lower secondary education and enroll close to six million students or 86 percent of the relevant age population. Basic education is delivered in various ways or modalities. Ninety-three percent of primary education is delivered in the general modality, which is a traditional approach that uses the approved (and uniform) national curriculum. The community and indigenous modalities often use different versions of the national

curriculum. In indigenous schools, students receive national primary school textbooks in their own languages [the *Secretaría de Educación Pública* (SEP) has translated these into more than 25 indigenous languages]. Often, community and indigenous classes take place in multi-grade² schools where one or two teachers are responsible for teaching all the grades. Multi-grade schools make up about 25 percent of the schools in the country and are most common at the primary level in rural areas.

Fifty-one percent of lower secondary schooling is delivered in the general modality, which again is the traditional format that follows the national curriculum for secondary schools. The technical modality imparts subjects geared towards training students in a technical skill (e.g., drawing, electronics, auto mechanics). The distance learning mode, also known as *Telesecundaria*, consists of lectures delivered via satellite TV. Distance secondary schools have one teacher per grade to facilitate lectures, assist students with their schoolwork, and answer questions.

Upper Secondary

Upper secondary consists of grades 10-12. Many upper secondary schools are part of large public universities. This means that the university manages them both administratively and financially. These schools also often guarantee university spots for their graduates. Other upper secondary schools are more technical in nature (for example, the *Colegio Nacional de Educación Profesional Técnica* (CONALEP) or the *Centros de Estudios Tecnológicos Industriales y de Servicios* (CETIS)), and cater to students of all ages who do not necessarily want a university career, but prefer to obtain technical or vocational training. Recent reforms to these institutions, however, have added the possibility of following an academic track that will provide students with the equivalent of a regular high school diploma that they can use to enter university if they wish to do so.

Higher Education

Higher education is mostly delivered at large public universities. In addition to the large national higher education institutions (like UNAM and the *Instituto Politécnico Nacional* (IPN), both located in Mexico City), each state has its own state university or state teachers' college. Public universities are autonomous, which means that even though they are publicly funded, their administrative and educational management is left to university boards and officials.

² Multi-grade schools are those where one or two teachers teach multiple (or all) grades simultaneously.

Governance Is Highly Centralized...

▣ **By law, basic education in Mexico is free, non-religious and publicly provided**

- Public schools enroll 87% of students
- The government is also responsible for early, indigenous, and teacher education

▣ **Decentralization in 1992 was mostly administrative**

- Most financial resources come from the central *Secretaría de Educación Pública* (SEP)
- Curriculum and general policies are still set centrally

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Article 3 of the Mexican Constitution states that compulsory basic education (grades 1–9) in Mexico shall be free of charge, non-religious, and publicly provided.³ The public school system enrolls 87 percent of all students in the country.⁴ Although not mandated by law, the government also assumes responsibility for providing early education, bilingual education for indigenous students, and teacher education.

In 1992, Mexico decentralized the basic education system to its 32 states in order to improve educational administration efficiency, and give states more control over educational budgets (including more control and incentives to raise local and state monies to finance their education systems) and greater influence on educational policy. The decentralization was mostly administrative. As we will see later on, in most cases states still receive the majority of their financial resources from the federal SEP in Mexico City. However, many states raise their own funds to invest in new teachers or schools.

State educational authorities cannot choose their own curriculum, as they must adhere to the one nationally designed and approved. States can, however, elect the content of the one or two optional courses in the curriculum. States must also use the nationally-produced textbooks for primary education, which are provided to students free of charge. For lower secondary, SEP provides all schools with approved lists of textbooks for each subject.

³ Secondary schooling (grades 7–9) was made compulsory in 1992 with the modernization reform implemented by President C. Salinas. Before that, only the first six years of primary schooling were compulsory.

⁴ The remainder of the students are enrolled in private schools, which on average show better student achievement results than public schools. (INEE, 2004)

State authorities and school administrators can choose textbooks from these lists. Neither principals nor parents have any official authority regarding personnel decisions such as hiring, firing, or placement of teachers.

Governance Is Highly Centralized (cont.)

▣ SEP sets school calendar at 200 days

- Primary schools meet for 4 hours/day
- Secondary schools meet for 7 hours/day

▣ Teachers and administrators have little autonomy

- SEP provides free national textbooks in primary and a list of approved textbooks in secondary
- Principals spend most of their time filling out paperwork
- By law, teachers and administrators have to belong to the national teachers' union (*Sindicato Nacional de Trabajadores de la Educación-SNTE*)

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SEP in Mexico City sets all major guidelines concerning teacher salaries, school calendar, and length of the school day. SEP's current school calendar consists of 200 days beginning in August and ending in June of each year. Primary schools can meet in three shifts: morning, afternoon and evening. All shifts last four hours, during which the four primary subjects are taught: Spanish, mathematics, natural sciences, and social sciences. There is little room for other activities such as art, physical education, or music, although some schools do make time for these subjects. Lower secondary schools meet for seven hours. Schools usually operate in morning and afternoon shifts. There are also night schools.

Teachers and administrators have little autonomy in the system. A recent Organization for Economic Cooperation and Development (OECD) report found that only 22 percent of educational decisions were made at the school level, compared with the OECD average of 42 percent (OECD, 2004). Teachers must follow the national curriculum and, in primary schools, use the national textbooks. In secondary schools they must choose textbooks from a nationally approved list. As previously discussed, school administrators have virtually no role in personnel decisions or allocation of resources (OECD, 2004). Principals' duties are mostly administrative: filling out paperwork, resolving conflicts, and managing the school's assigned budget. Principals can do community fundraising. They usually use the funds collected from these voluntary fees for building improvements and purchasing necessary equipment (e.g., copier machine, fax).

By law, all school personnel, including teachers and principals, must belong to the *Sindicato Nacional de Trabajadores de la Educación* (SNTE). This is the only teachers' union in the country and its membership is said to approach one million. School personnel

contribute about 1 percent of their salary to the union in the form of fees that get deducted automatically from each paycheck. Although SNTE has state and local factions and committees throughout the country, its leadership is mostly centralized. SNTE negotiates directly with the central SEP in Mexico City to determine teacher salary schedules and yearly increments. Other issues (such as placement of teachers, hiring, working conditions, and issues having to do with teacher colleges) are often negotiated by state SNTE factions with the corresponding state educational authorities.

SNTE is politically active and for years had very strong ties to the then ruling party, the *Partido Revolucionario Institucional* (PRI). Even though the PRI is no longer the ruling party in Mexico, it continues to hold the majority in Congress, and the majority of state-elected officials.

Funding

Mexico's Education Funding Has Grown, But Remains Low vs. Other Countries

- ▣ **Between 1995-2001, public spending on basic education increased by 36%**
 - Among the steepest increases in OECD (OECD, 2004)
- ▣ **Mexico's government spends \$28 billion annually on education**
 - 5.9% of GDP/capita (>OECD Average of 5.6%)
 - 24% of programmable federal budget
 - Per pupil spending averages US \$1,350 (one quarter of OECD average)
 - About 90% spent on teacher salaries

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Mexico's public spending on education amounts to 5.9 percent of GDP per capita, above the OECD average of 5.6 percent. Between 1995 and 2001, Mexico's public spending on basic education grew by 36 percent, among the steepest increases of all countries in the organization (OECD, 2004).

The government currently spends about \$28 billion yearly on education, almost a quarter of its programmable budget. On per-student terms, this is equivalent to US \$1,350, well below the OECD average. Spending is lowest in primary school (US \$800), then increases for upper secondary (\$1,700) and rises sharply for higher education (\$4,000). These disparities in the spending pattern across levels of education raise some important equity issues, as only a small section of the population is able to benefit from the higher spending in higher education. In addition, the share of the rural, low-income, or indigenous students (who tend to be among the most disadvantaged) who can benefit from public higher education is low when compared to populations in urban areas who are relatively better off.

As is the case in other countries, particularly in developing countries, educational authorities in Mexico have little room to spend resources on school reform programs, school equipment, teaching materials, and other improvement efforts, as teacher salaries represent about 90 percent of education spending (Latapí and Ulloa, 2000). Our interviews revealed that in some states (e.g., Aguascalientes), the proportion of the states' education budget spent on salaries could be as high as 98 percent.

Funding Is Allocated Based on Supply

- ▣ **Since 1997, federal financial resources transferred to the states are based on the number of schools and teachers that were decentralized in 1992**
- ▣ **85% of total spending financed through federal transfers to the states**
- ▣ **Formula provides little incentive for performance and local contribution**

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Funding for education in Mexico used to be based on negotiations between the federal (central) government and each state, before a financial reform was instituted in 1997. Before the reform, SEP negotiated centrally and directly with each state over the proportion of the national federal education budget they would receive. According to our interviews with educational officials, the practice created enormous confusion and inequities in the system, and lent itself to opportunistic or entirely discretionary allocations. It also led to distorted incentives. Because SEP could re-appropriate any monies the state saved by cutting costs or introducing more efficient administrative procedures, states had little incentive to improve their resource management.

In 1997, the Mexican Congress passed legislation to regulate financial transfers to the states for education spending. The new legislation created Appropriations Fund No. 33 which included all monies transferred to the states. The new mechanism made the transfer rules more transparent and eliminated the discretionary power previous SEP administrations had in transferring federal resources to the states. In addition, it corrected the incentive structure by specifying that any savings stemming from cost-reducing or more efficient management of educational resources could not be appropriated back by SEP.

To determine the amount of monies each state receives to finance education, the new law established that it would be proportional to the number of teachers and schools *that had been supported by the federal SEP in each state in 1992*. This meant that federal transfers to the states would be based on the number of federal teachers and schools present in the state during the 1992 fiscal year. Before 1992, both federal and state public education

systems operated side by side in many states. State-funded public schools and teachers (state systems) were virtually indistinguishable to parents or students from federally funded schools and teachers. The only difference between the two was the source of the funds (state or federal budgets) from which they were receiving resources or salaries. The magnitude of the state versus the federal systems in 1992 varied greatly from state to state. States with large state-funded systems were usually those with higher GDPs that were able to raise more resources locally (for example, Nuevo León). Others had to increase state resources to education because they had been unsuccessful in negotiating with federal authorities to secure enough federal funding to grow their systems to the desired level. In other words, the size of the state system did not always depend on local demand for education. Therefore, disparities between state and federal funding were preserved under the new 1997 education finance legislation.

Currently, more than 85 percent of states' total spending in public education is financed through federal transfers to the states. The new formula, although it corrects some perverse incentives and is overall more transparent, does not provide enough incentives for states to raise money locally or to reward states that have made significant improvements in outcomes or school performance. States that raise up to 40 percent of their education budgets locally are not rewarded in any way, nor are states that only raise 2 percent locally punished in any way. The argument could be made that introducing incentives (or bonuses) for states raising more money locally could be unfair to states that could not raise more money because of a lack of a tax base, in fact punishing them for relative poverty. However, it is also true that the current formula has no provisions to reward states that have made improvements in either local fundraising (however modest these are based on their baseline conditions) or educational quality indicators.

Allocation Formula Generates Inequities

- ▣ **Federal funding cannot adjust for equity or efficiency considerations**

- SEP cannot increase transfers for disadvantaged states

- ▣ **There are large disparities in states' funding for education:**

- Baja California and Mexico State contribute 40% of total education budget through state funds
- Oaxaca and Mexico City contribute only between 2-5%

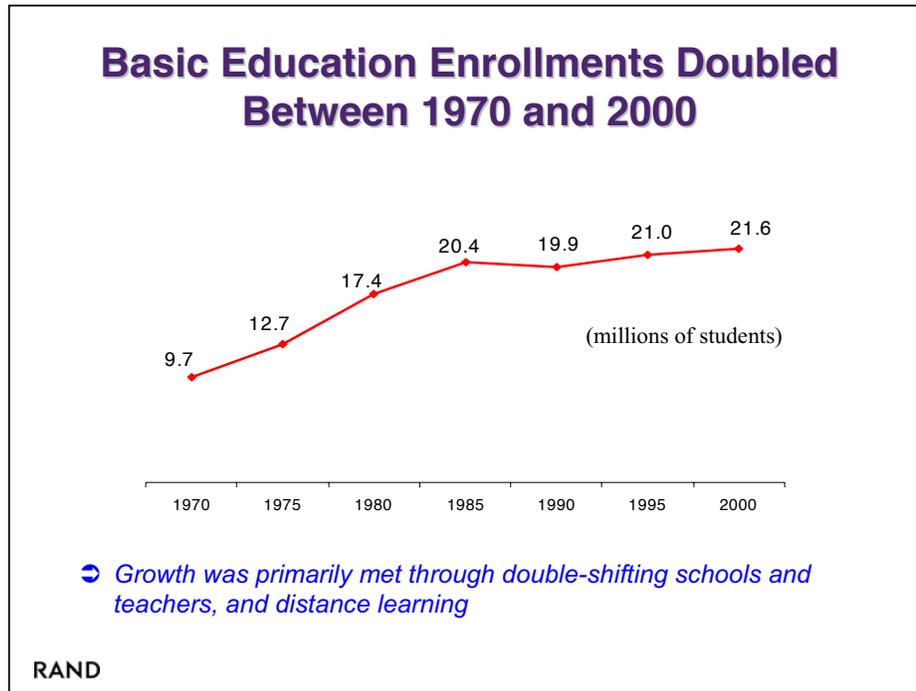
RAND

The education finance legislation introduced in 1997 that froze in place the funding pattern at that time maintained disparities in funding across states. States with large federal systems continue to receive more federal transfers than states with small federal systems, irrespective of states' needs or other equity or efficiency considerations.

Funding disparities are further accentuated because of variations in states' abilities to raise local funding for education. States at a greater disadvantage because of their lower income and development status (e.g., Chiapas or Oaxaca) do not receive much supplementary funding beyond federal transfers. By contrast, other states that have seen large population increases, like Baja California and Mexico State, are able to raise as much as 40 percent of their education budget via state funds.⁵ Meanwhile, states whose economy is relatively well off and have declining primary-age populations (like Mexico City) raise only 2 to 5 percent locally and have almost their entire education budgets covered by the federal SEP. States receiving the most federal support, therefore, are not necessarily those that need it most.

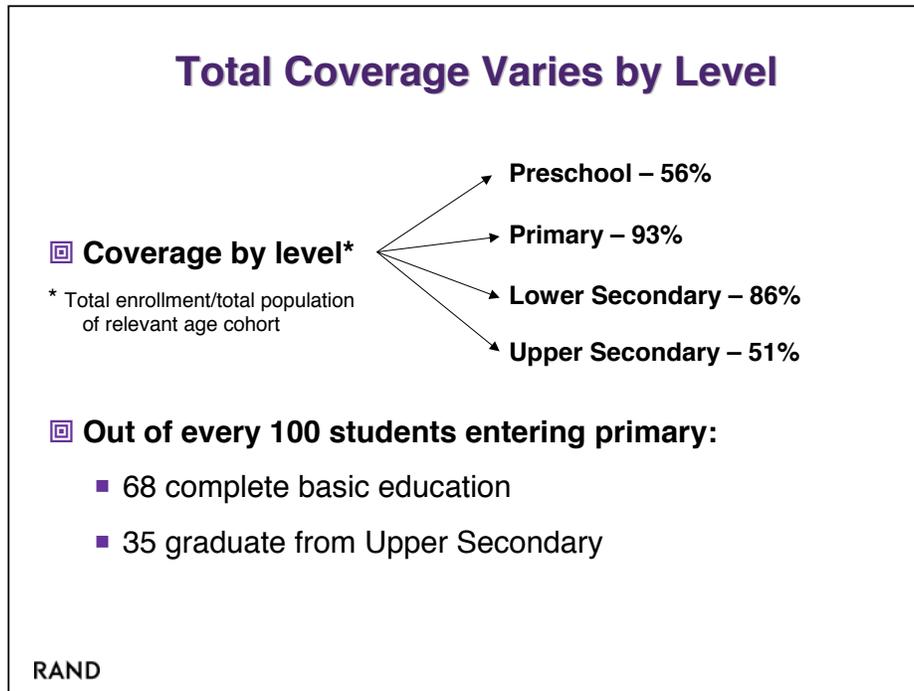
⁵ And they need to, because federal funding alone could not cover the entire cost of their education systems.

Enrollment and Performance



Between 1970 and 2000, basic education expanded significantly in Mexico. During this time enrollment more than doubled from 9.7 million students in 1970 to 21.6 million students in 2000. This meant that Mexico went from enrolling close to 70 percent of the relevant age population (ages six to 15) in basic education to enrolling 88 percent. Most of the growth occurred in the 10-year period between 1975 and 1985, a time when the fast population growth of the late 1960s and early 1970s put a lot of pressure on primary enrollments. Enrollment growth was not uniform across regions. Poorer states like Nayarit and Chiapas continued to have below average enrollment rates even in 2000.

This rapid growth in enrollments was primarily met through double-shifting schools and teachers. Lacking the resources to fund the construction of thousands of new school buildings, the Mexican government increased its utilization of existing infrastructure by introducing morning, afternoon, and evening school shifts. Teachers, who for years had argued that their wages were low, were given the opportunity to double-shift, that is to obtain two teaching positions, thereby doubling their wages. The drawback of this policy choice was that schools could no longer be utilized for extra-curricular activities because the buildings were being used all the time. It also introduced maintenance challenges as school buildings were being used to their full capacity. Enrollment growth was also met in secondary schools through the expansion of the distance-learning, or *telesecundaria* model.



Enrollment rates vary by level. Coverage is very high in primary schools (93 percent). It is lower in lower secondary schools (86 percent), and it is particularly low in preschools (56 percent) and upper secondary schools (51 percent). These figures include enrollment in *both* public and private schools at each level. At the basic education level, private participation in education is generally low. Private schools enroll slightly more than 10 percent of students in the country.

Roughly half of the relevant age cohort in upper secondary is not enrolled. It is unclear whether this is a supply- or demand-driven problem. It is possible that enrollments are below 100 percent because there are not enough schools or classes available. It is also possible that, because this level of education is not compulsory, students choose not to attend even though schools have enough space to accommodate them. We have not found a conclusive study regarding this issue, but interviews with SEP officials suggest that the explanation includes both supply and demand elements.

Out of every 100 students entering the first grade of primary school in Mexico, around 68 of them will complete all nine years of basic education. Thirty-five of these will go on to graduate from upper secondary. These numbers are taken by using the terminal efficiency or completion indicators and the absorption rates reported by SEP in its latest annual report (SEP, 2003). There are no precise data on how many of the upper secondary graduates enter college. We should note, though, that the dropout levels among those entering college are significant (as high as 77 percent according to figures from ANUIES, 2003). The actual portion of the population aged 18 and older in Mexico that holds a bachelor's degree is around 8.5 percent (Villa and Pacheco, 2004).

Although we do know from published sources how coverage varies by state (see Tables in Appendix A), we know little about how they vary by urban concentration, ethnicity, and socio-economic indicators. So even though the state breakdowns help us infer rural-urban and economic differences (for example, by contrasting coverage in wealthier, more industrial states, with those of poorer, highly rural states), we were not able to find published statistics or information that could help paint a complete picture of regional and other disparities in the country.⁶

⁶ This information might be available from SEP, but collecting and analyzing these data fell beyond the scope of this study.

Distance-Learning Increases Coverage at Lower Secondary Level

- ▣ **DL operates in areas where construction of new secondary schools is not feasible (i.e., rural areas)**
- ▣ **Lectures are delivered via satellite TV (15 minute programs)**
 - Class sizes of 22 (vs. 35 in regular schools)
 - One teacher/facilitator per grade
- ▣ **1.2 M enrollment (20% of total) in 16,500 schools**
- ▣ **In 1996, annual costs per student were 16% higher than regular schools**

RAND

As previously discussed, the government accommodated a large proportion of the enrollment growth in lower secondary, particularly in rural areas, through the expansion of the distance-learning or *telesecundaria* model. The first distance-learning secondary schools opened in 1968 in very rural or isolated communities that were hard to reach with conventional education services. To this day, *telesecundarias* are built mostly in rural areas where the number of students is not high enough to make new secondary-school construction cost effective.

Distance-learning schools need very little infrastructure and only one facilitator-teacher per grade. The assistant teacher is often a generalist that helps students with schoolwork and answers questions. Lectures are given via satellite TV in 15-minute programs. Class sizes are smaller than in regular schools (22 versus 35 students on average). In addition to the TV programs, students also receive free supplementary materials and textbooks.

In 2002, 1.2 million students were enrolled in distance-learning lower secondary schools. This represents about 20 percent of the total enrollment in this level. Annual costs per student were about 16 percent higher than in regular schools (counting TV program production, supplementary materials, teacher salaries, and infrastructure) (De Moura et al., 2000).

Distance-Learning Enrollments Are Higher in Rural and Poorer States

- ▣ **Distance-learning enrollments grew 95% in past decade**
- ▣ **Represents over 40% of lower secondary enrollments in poorer, highly rural states**
 - Chiapas, Puebla, Veracruz, Zacatecas
- ▣ **Represents fewer than 5% of enrollments in urban, industrial, and wealthier states**
 - Baja California, Coahuila, Mexico City, Nuevo León

RAND

The distance-learning model experienced spectacular growth (over 95 percent) in the past decade, while the regular and technical secondary enrollments either stagnated or declined. Most of this growth happened in poorer, highly rural states with low coverage in lower secondary education. The low coverage in these areas was partly due to the fact that rural areas were filled with isolated communities and very small towns, making it difficult for SEP to build secondary schools and find enough teachers willing to be deployed there. The distance model, then, was a cost-effective way to deliver lower secondary education in rural and isolated communities and enabled SEP to increase coverage at this level.

Distance-learning enrollments represent over 40 percent of enrollments in poorer, highly rural states like Chiapas, Veracruz, Puebla, and Zacatecas. On the other hand, fewer than 5 percent of students are enrolled in distance lower secondary schools in more urban, wealthier states like Mexico City, Baja California, Coahuila, and Nuevo León. As we will see later on, research has shown distance learning to be a cost-effective model for delivery of lower secondary education. Even though student achievement results and completion rates are not as high as they are in regular secondary schools, the fact that the model is a lot less expensive to implement makes it very attractive. However, there is still much to learn from the distance-learning experience in Mexico through more updated research and evaluation on the outcomes of students studying in this kind of environment.

Low Overall Attainment and Achievement Levels

▣ Average educational attainment of population aged 15+ is 7.9 years

- Mexico City and Nuevo León → 9.5 years
- Chiapas and Oaxaca → 6 years

▣ In international tests, Mexico scores below other countries in Latin America

- Last or second to last in mathematics and science on the TIMSS-95
- Below the regional Latin American mean on UNESCO tests (2000)...
- ...and below countries like Cuba, Argentina, and Brazil (UNESCO, 2000)

RAND

Educational attainment and achievement levels in Mexico are generally low, although they have improved greatly in the past 10 years. In 2003, average educational attainment of the population aged 15 and older was 7.9 years, while in 1993 it was 6.8 years. These averages mask important regional differences. Wealthier states like Nuevo León and Mexico City have average educational attainment rates of 9.5 years, which means children have completed basic education plus some upper secondary. In contrast, poorer states such as Oaxaca and Chiapas have average educational attainment of six years, which means children have completed basic primary education only.

Mexico has not fared well in recent international examinations. On the 1995 Third International Mathematics and Science Study (TIMSS), Mexican students placed last or second to last among a group of countries that included mostly developed nations. Even in Latin America, Mexican student-performance is among the lowest. The regional mean for language arts in the *Laboratorio Latinoamericano* student assessments conducted by UNESCO in 2000 was 261. Mexican student scored 250, below the regional Latin American mean, and below Cuba (342), Argentina (277), and Brazil (269). In mathematics, the regional mean was 257, while Mexican students scored 255. Again, this placed them below Cuba (357), Argentina (265), and Brazil (263).⁷

⁷ For full results, see UNESCO (2000).

Rural Lag Behind Urban Primaries in Reading and Math...

Type of Public Primary	% of 6 th graders achieving competency	
	Reading	Math
Urban	45	15
Rural	29	9
Community (multi-grade)	18	6
Indigenous	12	4

Source: INEE, 2003

RAND

There are important differences in achievement between different areas of the country. In urban schools, 45 percent and 15 percent of the sixth graders in Mexican public schools achieve satisfactory competency levels in reading and math on the national reading and mathematics achievement tests administered by SEP (INEE, 2003).

The proportions of students achieving satisfactory competency in reading and math is much lower in rural (29 percent and 9 percent), community (18 percent and 6 percent), and indigenous schools (12 percent and 4 percent), with the latter reporting the lowest achievement levels of all four groups. These differences have prompted the government to shift the education policy discourse from issues of coverage to a focus on educational quality and equity. As we will see later, some of the government's major educational improvement projects are precisely aimed at improving educational quality in Mexico's most disadvantaged areas.

Regular And Technical Schools Outperform Distance-Learning Schools at the Lower Secondary Level

Type of Public Secondary	Completion*	% of 9 th graders achieving competency	
		Reading	Math
Regular	78%	76	50
Technical	74%	74	48
Distance Learning	73%	62	40

* Percentage of entering 7th graders who completed lower secondary three years later
Source: Anexo Estadístico Reforma Secundaria, SEP, 2001; INEE, 2003

RAND

In the case of ninth graders, the proportion of students in regular lower secondary schools achieving satisfactory competency levels in reading and math is 75 percent and 50 percent, respectively. Results for students in technical schools are about the same. The proportion of ninth graders achieving satisfactory competency in reading and math declines for distance-learning students (62 percent and 40 percent). The latter are most likely to be found in rural areas.

In none of these cases have achievement scores been adjusted for socio-economic or other factors. Therefore, these numbers should not be interpreted as causal effects of each secondary school type.

Differences in completion rates among different types of lower secondary schools are not significant.⁸ Among all secondary school types, regular schools have the highest proportion of students completing all three grades of lower secondary, at 78 percent. Technical and distance schools have completion rates of 74 percent and 73 percent, respectively.

⁸ Because the dropout rate in secondary schools is so high, it is very likely that those making it to the ninth grade are among the better students. This selection bias is likely affecting achievement levels for these grades, which is not the case for primary schools, where the pool of students assessed is more likely to include students of all ability levels.

Key Actors in Education

Key Actors in Education are the Government and the Teachers' Union

▣ Government

- Federal government makes most policy decisions

▣ Teachers' Union

- 1 million members give it considerable political clout

- ↻ *Parent or PTA organizations are not widespread, and often have little influence*

RAND

The Ministry of Education (SEP) and the teachers' union (SNTE) are the two main constituents in the Mexican education policy arena. Virtually nothing gets done in Mexico in terms of research or educational reform, without SEP's involvement and authorization. SNTE is also an important player through which major reforms and policies need to gain approval.⁹ For example, of the 15 national committee members of the national teacher incentive program *Carrera Magisterial*, seven are members of the union.

Although parent groups are growing in popularity and influence, they still play a very limited role in education. Recent reforms, championed and funded through World Bank loans (e.g., Mexico's latest round of compensatory programs), have built-in components to increase the number of parental organizations and their influence. One such compensatory program (Consejo Nacional de Fomento Educativo (CONAFE), 2000) provides cash grants of US \$500 per year to parental organizations. These grants can be used for investing in infrastructure or materials parents deem important for the school. In return, parents must commit to greater involvement in school affairs and to attend training sessions delivered by state educational authorities with the Bank's assistance. This program was apparently

⁹ The teachers' union in Mexico gets much of its power from its monopoly status. Per law, public school teachers must belong to SNTE, the only teachers' union in the country, and must agree to pay it about one percent of their salaries in dues. SNTE currently has about one million members. For many years, SNTE leaders promised votes to the PRI in exchange for favors such as direct influence in determining the number of teachers to be hired every year (independent of actual demand), direct influence in the teacher colleges, and in education policymaking in the country.

behind the increase from 5,200 parental organizations registered in 1996 to more than 45,000 registered in 2000 (CONAFE, 2000). Moreover, recent government programs such as *Programa Escuelas de Calidad* (PEC) or Quality Schools Program, also encourage parental organizations to get more involved in schools.

International Organizations Have a Major and Long Standing Presence in Mexico

▣ **World Bank and Inter-American Bank have been in Mexico for over three decades**

▣ **Their focus is on basic education**

- Compensatory and community programs to alleviate funding inequities
- Training and capacity building (school administrators, teachers, parents, SEP officials)
- WB loans ≈ \$300 M / project (typically 2-3 years)
- IADB loans ≈ \$200-1,000 M / project

RAND

The World Bank and the Inter-American Development Bank (IADB) have been providing loans and technical assistance to the Mexican government for education for at least three decades. These organizations focus primarily on the basic education level.

The World Bank has made a series of loans to the government (about US \$300 million per loan) to finance compensatory programs that are targeted towards the poorest populations. Compensatory programs contain a wide variety of elements, but they emphasize investments in school infrastructure and the training of teachers, school administrators, Ministry of Education officials, and parents. The IADB financed some of the earliest distance-learning programs in Mexico. Its loans are also usually targeted toward education for the poor and education in rural areas. Recently, the IADB awarded Mexico one of its highest loans ever for the *Enciclomedia* project (more than US \$1 billion). These loans do not represent a large proportion of Mexico's total education budget (depending on the size of the loans for a particular year, they can represent from one to five percent of the budget), but they do represent a larger portion of Mexico's *available* budget for education programs and other interventions. The available budget is that which remains after teacher salaries and other fixed expenditures are accounted for.

Foundation Work is Not Wide Ranging, National Groups Have Limited Influence

▣ Foundations

- International (Ford - \$1M per year), works with local groups
- National (TELMEX) fund only scholarships for higher education
 - Others like “Vamos Mexico” are opportunistic

▣ Business associations (e.g. COPARMEX) are not systematically involved in education

▣ The many NGOs in the country are small and atomized

RAND

Ford Foundation is the one international foundation with a strong presence in Mexican education. Ford gives about US \$1 million in grants every year to educational institutions, nongovernmental organizations (NGOs), and initiatives. Recipients of such grants include the Mexican Council for Educational Research (known as *Consejo Mexicano de Investigación Educativa* (COMIE), which organizes national educational conferences, publishes one educational journal and is involved in research projects such as the Good Practices in Education project (which looked at innovation in five rural and indigenous schools), and the *Observatorio Ciudadano de la Educación*, a group of well-known researchers that put together press releases and congressional newsletters on current educational topics that are made available to the public through its Web page.

There are also a handful of national foundations that do some work in education. Among the largest is the Telmex Foundation, an organization that funds scholarships for higher education in Mexico and abroad. It also provides computer and Internet access to students and schools. There are many NGOs and private charity groups in Mexico City and scattered across the country that do educational work in Mexico, but none of these has a national presence.¹⁰

There are several state-level foundations that have played sporadic roles in funding research or school interventions. Such is the case of *Grupo G* in Jalisco, which partly funded a diagnostic study of the state’s education sector a few years ago. This study was conducted by researchers at the University of Guadalajara. Other foundations such as

¹⁰ One of our interviewees mentioned the existence of a national directory of NGOs involved in education in Mexico. Unfortunately, we were not able to obtain a copy of this document.

Vamos Mexico (led by President Vicente Fox's wife Martha Sahagun) devote some funds to education, but do not appear to follow a focused or long-term agenda. Overall, the influence of local foundations on education seems to be very limited.

Finally, there are business and community groups with limited, mostly local, influence on education. Large business associations like the *Confederación Patronal de la República Mexicana* (COPARMEX) are not systematically involved in education. The many educational NGOs in the country do work in all sorts of areas (e.g., indigenous education, training, science and technology). However, none of these has a national presence.

Key Issues and Programs That Address Them

Key Issues in Education are Related to Quality and Coverage

- ▣ Poor educational quality**
- ▣ Insufficient coverage in lower secondary**
- ▣ Insufficient upper secondary supply in rural areas**
- ▣ High dropout rates in levels beyond primary**

RAND

The main issues in Mexican education have to do with poor quality, insufficient coverage at some levels, and high dropout rates in levels beyond primary.

Poor educational quality, evidenced primarily by low achievement at all levels of the system, remains a key issue. Even in urban public schools, less than 20 percent of sixth graders achieve satisfactory or more than satisfactory competency in math. In lower secondary schools, where access and demand issues have kept out people with higher direct and indirect costs of schooling, the percent of students achieving competency in math remains at, or lower than, 50 percent. Finally, as noted earlier, in some international exams, Mexican students do not perform well. Because the issue of poor quality seems to be the most salient of all the issues we identified, we will discuss what we believe to be the main factors causing poor quality in the next slide.

Another key issue in Mexican education is that there are many youth in the relevant age cohort who are not enrolled in lower- and upper-secondary schools. The problem is likely related to both supply (i.e., not enough schools or classrooms), and demand factors (i.e., students choose not to attend), although research on the phenomenon is limited. Among those most affected are youth in marginal urban areas, rural areas, and members of indigenous groups. Our interviewees speculated that demand factors might play a larger role in marginal urban areas (i.e., students choose not to attend), because the opportunity cost of going to school (as opposed to working) in urban areas is higher.

Supply factors might play a larger role in rural and isolated indigenous communities where access to secondary schools is limited. Most indigenous communities do not have local secondary schools and students often have to travel for hours to reach the nearest one. At the lower secondary level, building enough schools in rural areas has been a challenge. This challenge has been met to a great degree by the growth of the distance-learning model, but at the upper secondary level students still need to travel to small towns and larger urban centers to find schools. This puts rural and indigenous students at a disadvantage, since they often have to leave their communities to further their education.

The factors previously described might also have to do with the high dropout rate in lower secondary schools, and in the transition from lower to upper secondary. The fact that almost a third of the people entering basic education do not complete this level signals that a large proportion of the population is leaving school without having acquired a basic set of competencies. This also affects the natural progression to higher levels of education. Out of every 100 students entering basic education, 68 complete it, but only 35 graduate from upper secondary. While supply factors might affect this (such as not having enough schools of these levels in rural and isolated areas), demand factors might also play a key role. The opportunity cost for students of staying in school gets increasingly higher in levels after primary. None of these reasons, however, have been sufficiently investigated for us to make more definitive statements about why these issues remain a problem in Mexico and how best to tackle them.

Poor Educational Quality is Attributed to Various Factors

- ▣ Lack of adequate teacher preparation**
- ▣ Short school day in primary**
- ▣ Teacher absenteeism in rural areas**
- ▣ Poor articulation of curriculum between primary and secondary**
- ▣ Poor infrastructure overall**

RAND

The most salient issue in Mexican education today has to do with poor educational quality. This is a complicated issue that is due to a variety of factors. One commonly cited reason is inadequate teacher preparation at both the primary and secondary level (Schmelkes, 1994; Santibañez, 2004; Tatto, 1999; Tatto and Velez, 1999).

Poor teacher training (pre-service and in-service) in Mexico is often blamed for low teacher quality (Santibañez, 2004). Mexico reformed its secondary school teacher college curriculum in 1999 to provide a stronger emphasis on subject-matter knowledge, pedagogical content knowledge, and practice. However, this teacher education reform was implemented almost six years after Mexico had reformed the secondary school curriculum. This meant that between 1993 and 1999, there were no formally-trained subject teachers to teach the new secondary school curriculum. During this time teachers were expected to learn new materials and teach the more specialized subjects demanded by the new curriculum without any formal support. Even after the 1999 reform, prospective teachers at the teacher colleges spent only about 15 percent of their time learning subject matter. This is important because these students have only a high school education, which often has not given them enough specialized training for the subject they hope to teach at the secondary level.

Another problem with the quality of teacher training, particularly at the secondary level, has to do with the fact that about 40 percent of teachers in Mexico have never attended a teacher education institution, nor have they received any kind of intensive in-service training to prepare them to teach. These individuals are usually university graduates or students who are hired to fill teacher shortages in certain subjects or regions.

Last, in-service teacher education is widely regarded as ineffective, although no empirical evidence exists to actually test this proposition. The fact that in-service courses and workshops are uniform for all teachers—which means that independent of seniority, educational background or type of school (rural or urban, general or distance), all teachers in the same subject take the same course—has been one of the main criticisms of the national in-service teacher training system.

Aside from issues related to the opportunities to learn available for students, school multi-shifting has additional consequences that may affect school quality. When schools are used to their full capacity and operate in two or three shifts, it is difficult to use the school as a learning community where students can spend longer periods of time and engage in extended sessions or extracurricular activities. Teachers are also affected by having to work multiple shifts (which most do to improve their salary conditions). This leads to teachers having little time to interact with students and parents, and having little time to prepare their classes and evaluate each student individually. The need to multi-shift school buildings has placed constraints on the amount of daily time available for instruction. A frequently cited reason for the poor quality of Mexican education is the short school day at the primary level; primary schools meet for only four hours per day. With schools operating up to three shifts per day, it becomes difficult to find space for students to remain in the building for longer than four hours, even when these additional hours could be justified by the need to provide more instruction, sports, arts, or extracurricular activities.

Another issue frequently mentioned as a cause of poor educational quality, particularly in rural areas, has to do with teacher absenteeism. Research conducted on eight schools as part of an evaluation of CONAFE's compensatory programs in Guerrero and Oaxaca found that teachers were in the classroom only about 50 percent of the time (100 days per year). Furthermore, when they were in the classroom, the length of the school day was usually shortened to about two to three hours per day of effective class time (Ezpeleta and Weiss, 1996).

Some of our interviewees voiced concerns over the lack of pedagogical connection between the primary and the secondary school curricula. As students progress from sixth grade to seventh grade, they switch from a four broad-subject curriculum to a highly specialized academic 10-subject curriculum in lower secondary schools. Although many of our interviewees thought this could affect students' ability to absorb information and follow a gradual progression from one level to the next, there is no research on this issue from which to draw conclusions about curricular alignment. Other countries with higher achievement levels, such as the United States, France, Germany, and Japan, have a similarly structured curricular transition from primary to secondary.

Another factor related to the quality of education is Mexico's poor overall educational infrastructure and the lack of schools and classrooms in some areas of the country, such as very small or isolated communities. Most of the funds made available to CONAFE through World Bank loans were used to improve basic school infrastructure and equipment, such as

bathrooms, cement floors, student desks, and blackboards. Many schools have inadequate or insufficient infrastructure for sports or physical education, and no arts or music facilities. Teachers often have to work with very limited resources and few schools have libraries, copier machines, and computers with Internet access. Interviews with teachers conducted as part of another study revealed that teachers in relatively wealthy Mexico City often had to buy their own teaching materials or materials for conducting science experiments and other activities with students (Santibañez, 2002).¹¹

¹¹ This lack of very basic infrastructure contrasts with the current government's emphasis on using computers and the Internet in schools. Only six percent of the schools in Mexico have access to computers and the Internet. Source: ILCE. See http://www.uneteya.org/seccion.asp-it_id=22&sec_id=27&com_id=0.htm.

Major Government Education Policies/Programs Target Key Issues

- ▣ Individual scholarships (Oportunidades) (\$2.1 billion)
- ▣ Technology in the Classroom - Enciclomedia (\$1 billion)
- ▣ School-based improvement programs – Quality Schools program (PEC) (\$140 million)
- ▣ Compensatory Programs (\$220 million)
- ▣ Pre-school and Secondary School Reform (n/a)

RAND

Before we discuss other issues affecting Mexican education, we should note that the government has in place four main education improvement projects that seek to address issues of poor quality through improving the quality of instruction, the quality of the infrastructure, encouraging student attendance, and increasing the use of technology in the classroom.

One of the main government educational programs is *Oportunidades* (formerly known as PROGRESA). *Oportunidades* provides cash grants to low-income families so that their children can attend school and health services. Grants range from \$10 to \$40, which are given monthly to the families of students from the third to the ninth grade. Students must commit to attending school at least 85 percent of the time.

A new program that has become one of SEP's top priorities for the coming years is *Enciclomedia*. This program digitalizes the school curriculum into CD-ROMs so students can learn interactively with the aid of computers. It also makes available to students Encarta, which is an electronic encyclopedia developed by Microsoft (Microsoft is one of the partners in the *Enciclomedia* project).¹² The program is now in place in close to 22,000

¹² Enciclomedia has close ties to Microsoft. In fact, congressmen objected to the project's request for bids for computer equipment, because it required all bidders to obtain certain Microsoft certificates which limited competition on the software side of the project. In addition, it will require the purchase of thousands of Microsoft® Encarta® licenses, if the project is scaled up. There are no provisions in the project to use non-Windows® based software, unless additional licenses are obtained. More information on this project can be found at <http://slash.fcencias.unam/?q=node/view/51>.

fifth- and sixth-grade classrooms around the country. All of these pilot schools have been given all the necessary computer equipment.

A smaller program that has gained popularity in the last few years is the *Programa Escuelas de Calidad* (PEC), or quality schools program. This program targets low-performing schools, which must consent to implement a school wide reform project in exchange for grants of up to \$10,000 to be used mainly for infrastructure improvements. PEC requires schools to develop a school improvement plan with input from teachers, parents, students, and school administrators. It also lengthens the school day by one to two hours each day.

The program began in 2001 in approximately 2,200 schools. It is expected to expand to 35,000 schools by 2006 (about 20 percent of all schools in the country). The program's relatively low budget (\$140 million), most of which is used for the provision grants, and the positive outcomes and feedback it has garnered, turned it into one of SEP's prized programs. The program has been formally evaluated by various organizations and the results of the evaluations are posted on the program's Web site (<http://basica.sep.gob.mx/dgie/escuelasdecalidad/>). Overall, the evaluations give the program high ratings. Results should be taken with caution, however, as these evaluations' methods are mostly descriptive and cannot estimate causal or programmatic effects.

Last, for over 10 years, SEP has had in place a wide range of compensatory programs. Most of these have been funded with loans from the World Bank. The programs operate under the umbrella of CONAFE (*Consejo Nacional de Fomento Educativo*)—a department within SEP—and target schools in isolated rural and poor areas. Most of these programs are aimed at improving school infrastructure, equipment, and materials, and providing incentives to teachers and school principals in order to decrease teacher absenteeism and improve school supervision functions. The budget for these programs is estimated around \$200–300 million per year.

3. RESEARCH ON EDUCATION IN MEXICO

Briefing Outline

- ▣ Status of Mexico's Education
 - Organization and governance
 - Funding
 - Coverage and performance
 - Key actors
 - Key issues and programs that address them
- ▣ **Research on Education**
- ▣ Opportunities for Hewlett

RAND

This section describes the status of research on education and assesses the capacity for education research and policy evaluation in Mexico. The lack of resources devoted to these activities and the importance they are believed to play in policymaking and effective education reform, coupled with The William and Flora Hewlett Foundation's tradition of and experience with funding this kind of education work, make these two potential areas of opportunity for Hewlett. This review covers system wide and state-level research capacity, main institutions, quality of existing research, and widely studied topics.

Education Research and Evaluation is Scant and Mostly Qualitative

- ▣ **Research is mostly conducted by a handful of institutions and is publicly funded**
- ▣ **Education research in Mexico is mainly qualitative and ethnographic**
 - Few quantitative studies, even fewer policy-analysis or impact-type studies
- ▣ **Evaluative research is limited**
- ▣ **Data is plentiful, but often is not publicly available**

RAND

Educational research in Mexico can be traced back to at least 1936 when the *Instituto Nacional de Pedagogía* (National Pedagogical Institute) opened its doors. Since then, and particularly after the 1970s, the field has expanded considerably. The numbers of research institutions and scholars have increased, and the topics and theoretical approaches adopted in educational research have grown more diverse (Weiss, 2003).

Pedagogy and educational psychology were favorite fields of study in the 1950s and 1960s. Research in math education and history of education grew considerably after the mid-1970s and spurred the development of two strong academic communities. Since the mid-1990s, research in Mexico has taken new directions including interests in education coverage and quality; teacher training; teaching and learning processes; non-formal, adult, and popular education; curriculum development; institutional and organizational studies; evaluation; education policies; education planning and management; communication and culture; epistemology; and education technology. Fields related to decisionmaking (like evaluation and education planning and management) expanded during the 1990s, but had a weaker development than had been expected in the 1980s (Weiss, 1999).

Education researchers in Mexico, because of a traditional emphasis on ethnography and perhaps lack of large-scale quantitative data, tend to favor qualitative approaches. Ethnographic approaches are useful to help us understand the factors that affect educational processes and how these processes come about. They are less helpful, however, for large-scale evaluation purposes or for diagnostic activities that require a greater degree of result generalization. Most of the quantitative research that is

generalizable and can provide large-scale insights tends to be descriptive and not evaluative in nature.

Difficulty accessing government data sets is one of the reasons that quantitative research in the country has not developed as expected. SEP collects a wealth of data and information on students, schools, teachers and government programs. Most of this information, however, is only publicly available at the aggregated national- or state-level. Data available on the web, for example, usually include only basic statistics such as enrollments, average educational attainment, educational coverage, gross spending figures, and numbers of schools and teachers in the system. Even though SEP at both the federal and state levels collects and maintains school- and student-level data (even linkable, longitudinal data in some cases), they are available only at its discretion. The Mexican government has been reluctant to share its large datasets with researchers. Even when it has, analysis has been difficult due to the poor quality and organization of the databases. Those program and policy evaluations that are performed on government projects and policies are usually commissioned by SEP and kept for internal purposes only. It is largely SEP's discretion as to whether the results are made public or not. This complicates the independent quantitative researchers' task, as it is difficult to rely or build on previous research or previously collected data. As noted earlier, foundations currently play a minor role in funding independent evaluations of state projects and policies.

Another reason for the weak focus on quantitative research has to do with the inbreeding that occurs at the largest and most important schools of education. Many schools of education in universities such as Aguascalientes, UNAM, and CINVESTAV largely hire their own graduates. For example, CINVESTAV, the institution with the most highly reputed graduate programs in education, has 22 faculty members, 11 of whom are graduates from their own Ph.D. programs. It is not surprising that researchers who have been mostly trained in qualitative and ethnographic methods would go on to replicate these in their own research and training of future graduates.

Major Exception Was PROGRESA

▣ PROGRESA aims to fight poverty through cash transfers (\$10-\$40)

- Grants are given to families in exchange for attending school and other services

▣ Program was designed and implemented as a randomized experiment

▣ Its rigorous evaluation component was made possible by:

- Early proponents who were all highly-skilled government officials and academics
- Strong support from President Zedillo (himself an academic)

RAND

One of the major exceptions to the general lack of evaluation and rigorous research in Mexico was the case of PROGRESA, a program introduced in 1997 that is now known as *Oportunidades*. PROGRESA aimed to reduce extreme poverty by providing funds to families for education, nutrition, and health services. The education component rested on the premise that children from low-income families were not unaware of the benefits of investing in human capital, but could not attend school because their income status made these investments unaffordable (Parker and Teruel, 2003). The logic was that if the government could cover most of the high opportunity cost of schooling for families in extreme poverty, children would stay in school. The program began providing grants to over 120,000 households in 1997. Cash grants of approximately \$10–40 were given monthly to the woman or mother of the household in exchange for her commitment to keep her children in school at least 85 percent of the school year. By 2000, PROGRESA had a budget of roughly \$800 million.

The program was unusual because its original proponents made sure it had a strong evaluation component from the very beginning, making it the first social policy in Mexico to be rigorously evaluated. PROGRESA was implemented following an experimental design in which a randomly selected group of students obtained the grants, and were compared to a randomly selected control group. From the beginning, program officers were convinced that a rigorous, independent evaluation of the program would be necessary to ensure PROGRESA would not be eliminated with changes in the government (Parker and Teruel, 2003).

Perhaps this approach developed in part because PROGRESA's early proponents, all highly skilled government officials, had academic backgrounds. One of them, Santiago

Levy, then an undersecretary in the Finance Ministry, had been a professor and a research economist for many years and had in fact developed initial designs for a program like PROGRESA. Initially, the Ministry of Social Development opposed PROGRESA's design as a randomized experiment. Support from then President Zedillo (from the PRI) was crucial during this initial stage. It did not hurt that, during the late 1990s, Congress had a PRI majority, which tended to support all of the President's initiatives.

The program hired the International Food Policy Research Institute (IFPRI) to carry out an external impact evaluation between 1998 and 2000. Government and PROGRESA officials did not make this evaluation public until it was completed in 2000. Once the results and the design of the project were released, many critics voiced concerns over the ethical issues involved in selecting a control group. Other critics expressed their disagreement with the fact that the government had paid \$2.5 million for an external evaluation, instead of channeling these funds to help additional families.¹³ However, these critics' opinions were largely overshadowed by the strength of the empirical evidence supporting the program's benefits. In fact, after the IFPRI evaluation was released to the public, Congress issued a new law requiring *all* social programs to be externally evaluated for their impact. The provision that national institutions be given preference when awarding external evaluation contracts might reflect the influence of critics' opinions.

After almost two years of implementation, researchers gathered data on both groups and were able to conclude, with a reasonable level of statistical confidence, that the cash grants had in fact improved school attendance, reduced grade repetition and school dropouts, reduced poverty, and increased the use of preventive health services and basic nutrition (IFPRI, 2002). Among the factors program officials considered critical to its success were the following: (1) ongoing technical expertise since the program's design phase; (2) ability of different Ministries to pool resources (human and other), and work together; (3) strong initial evaluation component; (4) involvement of prestigious academics in the evaluation, lending credibility to the results; (5) strong political support to get the program started (including the politically difficult evaluation component). All of these factors are discussed at length in Parker (2003).

When Vicente Fox became President of Mexico, he initially did not embrace PROGRESA (Parker, 2003). However the program's popularity and the rigor of the positive evidence presented by IFPRI's evaluation (which by then had made the rounds of the international academic and development circles) were factors behind his decision to keep the program under the new name of *Oportunidades*. The program is now expanding into urban areas and upper secondary schools using funds secured through a large IADB loan.

¹³ One reason that the program's evaluation ended at the end of 1999 (instead of at the end of 2000 as planned) had to do with the fact that control group families complained to state authorities about their control status and exerted pressure to obtain PROGRESA benefits (Parker and Teruel, 2003).

Research System in Mexico Has Severe Limitations

- ▣ **Mexico has 0.6 researchers/ 1,000 economically active people**
 - U.S.=8.6, Argentina=1.7
 - 80% of Mexico's higher education faculty holds only a bachelor's degree (NSF, 2000)
- ▣ **In 2002, Mexico graduated 1,250 PhD students in all disciplines**
 - 140 in education and humanities
 - The U.S. awarded 6,500 doctorates just in education (2002)
- ▣ **Only two Education PhD programs classified as "High-Quality"**

RAND

One of the main reasons for insufficient high-quality education research and evaluation in Mexico is the low overall research capacity in the country. Mexico has only 0.6 researchers (in all disciplines) for every 1,000 economically active people in the country. In comparison, the U.S has 8.6 researchers for every 1,000 economically active people and Argentina has 1.7.

In 2002, Mexico graduated a total of 1,250 Ph.D. students in *all* disciplines (Consejo Nacional de Ciencia y Tecnología, 2003). Of these, about 140 obtained doctorates in education and the humanities.¹⁴ For comparison, in 2002, U.S. institutions of higher education awarded 6,700 Ph.D. degrees in education alone. Even if we adjust for differences in population size, the disparities are large. On a per-capita basis, Mexico graduated 1.4 education Ph.D.'s per every million inhabitants, while the United States graduated about 22. In fact, the number of education doctoral degrees conferred in the United States during 2002 is six times the number of education and humanities degrees conferred by Mexican institutions *since 1990* (about 1,100). Mexico does not graduate enough Ph.D. or even master's students to increase its research or teaching capacity substantially. The National Science Foundation (NSF) estimates that currently about 80 percent of Mexico's faculty teaching in higher education institutions hold only bachelor's degrees (NSF, 2000).

Mexican authorities use two standards to accredit and recognize high-quality education research and graduate programs in the country. The first is a program known as the *Sistema*

¹⁴ Since this category lumps together disciplines such as history, anthropology, and literature, the number of education Ph.D.'s is actually considerably lower.

Nacional de Investigadores (SNI) or national researcher system. The SNI program is designed to reward high-quality research in the country by providing salary bonuses to researchers who are admitted into the system. The system has three membership levels (I–III) with varying criteria that include holding a Ph.D., publishing in peer-reviewed publications, and advising and training graduate students. Researchers in the lowest level of SNI (Level I) receive US \$1,500 every month as an SNI incentive. For many junior-level researchers in public universities, this incentive doubles their monthly salaries. Researchers in the Level III category receive a monthly incentive of about US \$3,000.

According to the *Consejo Nacional de Ciencia y Tecnología* (CONACYT) report on the state of science and technology in the country, in 2003 there were 9,200 SNI members in the country, 60 percent of whom were registered as Level I. CONACYT does not report SNI membership by specific discipline (i.e., education), but only by broad categories. In this categorization, education belongs to the broad social sciences, which had about 1,000 SNI members in 2003. It is not clear how many education researchers in the country are members of SNI, but given that the social sciences category includes large disciplines like economics, history, and sociology, the numbers are certainly low.

Mexico's second quality standard for research applies to higher education programs. Since 2001, SEP and CONACYT jointly instituted the *Programa Nacional de Posgrado* (PNP), or national graduate program. Entry into the PNP registry allows universities to become eligible for CONACYT faculty and student scholarships, and institutional grants to support research and graduate programs. The PNP program has strict requirements for accreditation of excellent programs based on a number of research-based criteria such as minimum number of faculty with Ph.D. levels (at least 9 Ph.D.-level professors), faculty publication records, grant and awards records, and graduation rates. The PNP is intended to substitute for CONACYT's Excellence Registry (or *Padrón de Excelencia*). All university programs that were formerly registered in the Excellence Registry have until 2006 to meet the criteria for entry into the PNP. Because the PNP has more stringent criteria than CONACYT's Excellence Registry, it might be the case that some programs cannot meet the new requirements.

Both the Excellence Registry and the *Programa Nacional de Posgrado* (PNP) distinguish between high-quality programs, and international-quality programs, with the latter being the highest distinction a program can receive. Out of more than 200 graduate programs in education in Mexico, only four (two M.A. and two Ph.D. programs) are recognized by CONACYT's Excellence Registry or the PNP. Out of these, only one program, CINVESTAV's Ph.D. in education research, has received the international-quality distinction.

Most Research Is Done by a Handful of Mexico City-Based Institutions and is Publicly Funded

Institution	Capacity	Focus
UNAM-Centro de Estudios Sobre la Universidad (CESU)	50 researchers	Higher education
IPN-CINVESTAV	30 researchers	Ethnographic studies, curriculum
Centro de Investigación y Docencia Económica (CIDE)	2-3 researchers	Policy and economics of education
Universidad Pedagógica Nacional	15 researchers	Pedagogy, history of education, indigenous education
Centro de Estudios Educativos (CEE)	20 researchers	Program evaluation

↻ *Maximum individual grants about \$50-200K (depending on institution). Evaluations are up to \$600K.*

RAND

The low number of education researchers in Mexico limits the country's research capacity. These limitations are further evidenced by the fact that most of the education research in Mexico is conducted at a handful of research centers and universities located in Mexico City. These tend to be better funded than research centers and universities in the states, and also tend to have a longer history of conducting education research. Most universities outside of Mexico City have failed to reach the necessary critical mass to foster education research communities, hampering the growth of research capacity in the subject. In addition, universities outside of Mexico City tend to receive fewer funds for research or fail to qualify for national grants (such as those from CONACYT) that usually require professors to fulfill certain requisites (such as having a Ph.D.).

Here we review some of the main education research centers in the country. The purpose of this review is to identify specific institutions that could be recipients of Hewlett's funding efforts. The information presented was mainly collected during visits to these institutions and interviews with professors working there. The intent was to gauge research capacity and identify subject or research areas with which institutions had the most experience and expertise.

The *Centro de Estudios Sobre la Universidad (CESU)*, is the *Universidad Nacional Autónoma de México's (UNAM)* main education research center. It mostly conducts research on higher education and the history of education. It is one of the largest education research centers in the country with about 50 full-time researchers. Although UNAM does not have a Ph.D. program in education, it does offer graduate programs in pedagogy and in social sciences such as economics, sociology, and public administration with an emphasis

on education. Overall, UNAM has more than 100 researchers on education in its various centers and academic departments (Colina and Osorio, 2003).

The *Centro de Investigación y Estudios Avanzados* (CINVESTAV) is reportedly the most prestigious research center in Mexico. It is affiliated with the *Instituto Politécnico Nacional* (IPN). CINVESTAV employs about 30 full time professor/researchers in its education research department or *Departamento de Investigaciones Educativas* (DIE). Researchers at CINVESTAV have a long tradition of qualitative ethnographic research on school and learning processes. Particularly important themes in CINVESTAV's research agenda include teaching and learning (i.e., pedagogy, curriculum, teaching practices and methodologies, cognitive development processes) and history of education. In addition to being an education think tank, since 1985 CINVESTAV has offered masters and doctorate programs in educational research and mathematics education, among others.

Although it does not house an education research center, the *Centro de Investigación y Docencia Económica* (CIDE), a small, public, and well-regarded autonomous university, has been producing quality education research for the past few years. It does not offer graduate programs in education. The two to three professors who conduct educational research at CIDE, however, have considerable prestige in the education community and have been able to secure large grants for their research agendas. CIDE's education research agenda is focused on education policy, the economics of education, and the sociology of education. CIDE has expressed an interest in expanding its education focus, perhaps opening a graduate program in education aimed at training education researchers.

Founded in 1978, the national pedagogic university or *Universidad Pedagógica Nacional* (UPN) is the largest public university that trains education professionals in Mexico. It has one large central campus located in Mexico City and 76 campuses located throughout the country. It offers education programs at the undergraduate and graduate levels; however, it does not offer teacher certification (the degree necessary to become a primary or secondary school teacher in Mexico).¹⁵ Its undergraduate programs include adult education, indigenous education, educational administration, educational psychology, and pedagogy. Its graduate programs include an M.A. program in educational development and a Ph.D. program in Education. Although it has a large faculty, only about 15 individuals are engaged in education research.

Founded in 1963, the *Centro de Estudios Educativos* (CEE) is the oldest education research center in Mexico and it is the only strictly education research center in Mexico not affiliated with a university. CEE's research agenda includes major evaluations of education reforms, particularly those targeted towards low-income children. It also does research on labor markets and education, and on the sociology of education. Lately, however, it appears that CEE's reputation has suffered somewhat after the loss of some key senior research staff.

¹⁵ These are offered by the public teacher colleges (i.e., *normal* schools).

Only CINVESTAV's doctorate in educational research has received the international-quality distinction by the *Programa Nacional de Posgrado* (PNP). Programs that have received the high-quality distinction include CINVESTAV's master's programs in educational research and mathematics education, CIDE's master's programs in economics and public policy, and UNAM's master's programs in sociology, economics, history, and political science.

The Mexican government spends about 0.4 of GDP per capita annually on research and technology. This is equivalent to about US \$2.3 billion. As a proportion of GDP per capita, Mexico spends considerably less than the United States (2.8 percent of GDP per capita), and less than other Latin American countries (i.e., Argentina spends 0.47 percent and Brazil 0.9 percent of the GDP per capita on research and technology). Our interviews revealed that a typical federal research grant ranges from US \$50,000 to \$200,000 per year. We estimate that this would buy about 1.5 to 2 full-time researchers with either a Ph.D. or a Level I rating from SNI. Grants in the lower range are usually provided by the universities and institutions themselves from the public funds they receive for research purposes. Grants in the higher range are usually provided through CONACYT (the national science and technology council), and are awarded through competitive RFP processes.¹⁶ Evaluations of government programs (funded by SEP), can run in the millions of dollars, but these are proprietary and researchers have limited power to exercise publication and dissemination rights without SEP's prior authorization.

¹⁶ CONACYT's budget for investments in science and technology in 2004 (including research grants to individuals and higher education institutions and salary incentives provided through SNI) was around US \$700 million.

Research Capacity at the State-Level Varies Greatly

Institution	Capacity	Research Strengths
Universidad Autónoma de Aguascalientes (Aguascalientes)	7 researchers	Teaching methodologies, education policy, history of education
Universidad de Guadalajara (Jalisco)	20 researchers	Education policy, gender, indigenous education, teaching methodologies
Universidad Iberoamericana – ITESO (Jalisco)	2 researchers	Education policy, cognitive processes, indigenous education, and technology and education
Tecnológico de Monterrey (Nuevo León)	9 researchers	Distance learning, technology in education, impact of technology on learning

RAND

Although most education research is concentrated in institutions located in Mexico City, education research communities can also be found in several higher education institutions outside of Mexico City. Two of the state-level actors in education research are the *Universidad Autónoma de Aguascalientes* (UAA) and the *Universidad de Guadalajara* (UdeG). Both of these are public universities with long-established departments of education. Other smaller actors are the *Instituto Tecnológico y de Estudios Superiores de Monterrey* (ITESM) in Nuevo León, and the *Instituto Tecnológico y de Estudios Superiores de Occidente* (ITESO), a university located in Jalisco that is part of the *Universidad Iberoamericana*'s system.

UAA offers bachelors, masters and doctoral degrees in education. Most of its programs are geared towards providing in-service training for educational practitioners (i.e., teachers, principals, policymakers). Their research strengths are in the areas of teaching methodologies, educational policy, history of education, and educational evaluation. UAA's doctorate program in education aims to train education researchers.¹⁷ The program is inter-institutional, which means that UAA partners up with other universities across the country (e.g., UNAM, CINVESTAV, UdeG). Because UAA is small, it does not have enough Ph.D.-level faculty to serve on the dissertation committees of all its Ph.D. students. Thus, they have had to partner with other universities (like UNAM) in order to gain access

¹⁷ Since UAA's graduate programs were created in 1993, approximately 75 students have received master's degrees in educational research and about 35 have received doctorates in educational research. Both the masters and the Ph.D. program in education research were registered in CONACYT's Excellence Registry. On their first attempt, however, the Ph.D. program failed to meet the necessary requirements for the new PNP registry, and their faculty mentioned that unless they can find a way to recruit more Ph.D.-level faculty, they are not likely to meet PNP requirements by the 2006 deadline.

to their faculties. UAA's department of education has 22 professors, but only seven have a Ph.D. and are engaged in research. Only two of these are members of SNI. The university authorizes SNI professors to conduct up to 30 hours of research per week. All other faculty members engage primarily in teaching and administrative duties.

Universidad de Guadalajara (UdeG), in the state of Jalisco, is the second-largest university in Mexico after UNAM. It offers two M.A. degree programs and one Ph.D. program in education. Research strengths are education policy, gender, indigenous education, and teaching methodologies. UdeG has about 70 professors in its education department. About 20 of these have Ph.D.s and engage in education research. About 15 of these are SNI members. UdeG places a lot of weight on publication record and grant record for the evaluation of research professors. UdeG has a unique peso-by-peso matching funds program for its researchers that matches each peso received from outside research funding agencies or individuals, up to a specified maximum. This has encouraged many UdeG faculty to find research support from outside the university. One of its master's programs (M.A. in higher education) is a member of *Programa Nacional de Posgrado (PNP)* national registry. The Ph.D. program in education is a member of CONACYT's Excellence Registry but has thus far not made it into PNP.

The *Universidad Iberoamericana (IBERO)* system has several campuses that do some education research. The ITESO-IBERO campus in Guadalajara, Jalisco, does limited research on the philosophy of education, education policy, indigenous education, and technology and education. None of its professors, however, has a Ph.D., and none belongs to SNI. Furthermore, none of their programs is part of PNP or the Excellence Registry.

In the state of Nuevo León, one of the wealthiest states in Mexico, there are very few institutions conducting education research. We visited the *Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM)*, one of the largest and most reputed private universities in the country, at its flagship Monterrey campus. The campus has recently opened a new social sciences division, but thus far there are no professors doing education research full-time, and no graduate programs in education. However, ITESM's master plan for the year 2015 does place education and public policy research at the top of its agenda, so its research situation might change in the near future. ITESM, contrary to other universities, provides substantial research support grants of up to US \$100,000 for new research initiatives. ITESM also offers substantially higher salaries to its professors (up to \$5,000 per month for assistant professors with a Ph.D., including all benefits), so it is in a better position than public universities to attract top talent. The fact that its research community is almost nonexistent, however, might prove to be a drawback for young researchers looking to build a career in education research.

ITESM's virtual university (*Universidad Virtual*) does offer graduate programs in education, including one Ph.D. program delivered via the Internet. Its faculty includes eight Ph.D.-level professors, and 20 full-time master's level professors. Its research strengths are in the areas of distance education, technology in education, and the impact of

technology on learning. In 2006, it plans to submit its distance-education graduate programs for inclusion into the PNP.

Key Issues Faced by State Universities Relate to Isolation, Lack of Funds and Flexibility

- ▣ **Low salaries and relative isolation make hiring of Ph.D.-level faculty difficult**
 - Public universities are also constrained in the hiring of new staff
- ▣ **Most faculty time is spent teaching**
- ▣ **Lack of funds limits more ambitious research projects**
 - No current major evaluations

RAND

Main issues identified by interviewees for universities in Aguascalientes, Jalisco, and Nuevo León were related to recruiting qualified research staff and securing funding. Because most graduate programs are in Mexico City, young Ph.D. graduates tend to feel isolated in state universities, and except for the case of the Universidad de Guadalajara in Jalisco, few state-level universities have reached the critical mass of faculty necessary to create vibrant research communities.

Education departments at public universities are often constrained by the university's administration in the hiring of new staff. The case of the *Universidad de Aguascalientes* (UAA) illustrates this problem. UAA has a very hard time recruiting Ph.D. faculty because of the low salaries and institutional restrictions that allow it to recruit only a fixed number of professors each year. For the past two years, UAA's education department has been trying to recruit two professors to fill two tenure-track positions. The main reason its recruitment efforts have been unsuccessful is the low salary for these positions, about \$1,500 per month (slightly more than what a secondary school teacher makes). Even the highest paid professors at the university make little more than \$2,000 per month. One possibility the department considered to overcome this problem was to combine the two open positions into one new position that paid a higher salary. The university, however, will not authorize them to combine the two positions because of a rule that no new position can be created until open positions are filled.

A related problem has to do with securing enough funding to devote faculty time to research. At most universities, with the exception of the University of Guadalajara, only a

handful of teachers do any research. For example, at UAA, seven faculty members conduct education research, but only two of these spend at least half of their time doing research. ITESM is in a similar situation, as only a small proportion of their faculty has been engaged in any research projects in the recent past.

There are two reasons for the shortage in research funding at state universities. Most faculty, because they lack SNI affiliation or other credentials (such as having a Ph.D.), have a hard time securing independent funding for their research projects. This limits their ability to work on more ambitious projects such as large-scale evaluations of education reforms. Other institutions offer substantial funding opportunities but do not have enough capacity in their education departments for faculty to take advantage of these. ITESM, for example, has a seed-grant program to fund nascent research agendas, but the education faculty at the *Universidad Virtual* has been unable to compete for these funds because hardly anybody is engaged in research.

In General, System Suffers From Lack of Transparency and Objective Evaluation

☐ Lack of transparency in the system

- Finances are obscure in many states
- We know little about the quality of educational services being offered in various regions

☐ Lack of research and systemic evaluation

- This is partly due to poor access to data
- And not enough capacity to do objective, independent research

☐ Result is that programs are implemented full-scale with little research behind them

RAND

Some exceptions notwithstanding (e.g., PROGRESA), the Mexican education system is characterized by a lack of transparency and objective evaluation. Most of the workings of state and federal education authorities remain a complete mystery to the public. As previously discussed, until 2002, when the new Transparency Law was enacted, SEP did not have the obligation to report to the public its expenditures, finances, and student outcomes. Before this law was enacted, it was very difficult for the public to find out how much teachers and other school personnel were paid, and how much of SEP's budget was being spent on administrative versus educational activities. SEP also rarely disseminated information about educational quality. In 1995 (and until 2001), SEP did not allow TIMSS to publish the results of assessments of Mexican students.

Even though the new transparency law has made information much more accessible (even posting many of these data on the Internet) and could lead to improved research for policymaking purposes, it is still difficult to access data that allow for a finer breakdown of school expenditures, such as per-pupil expenditures in the various states; budgets allocated for teacher salaries; or indeed the actual number of teachers (as opposed to teaching positions or plazas) in the system. And little is known about how education indicators break down by urban concentration, socioeconomic status, or region.

This lack of transparency and poor access to data is partly to blame for the lack of educational research and systemic evaluation. However, the lack of educational research and evaluation is also related to an overall low research capacity in the system, which then hampers Mexico's efforts at effective policy making. Mexico does not graduate large

numbers of Ph.D.-level education researchers and funds for research and evaluation are scarce (which might be why many people decide not to make a living out of research or academia). Lastly, because SEP usually retains all rights of publication and dissemination of the research and evaluations it funds, it is difficult to find independent research that can have more immediate policy consequences.

New Transparency Laws Open Opportunities for Objective, Independent Research and Evaluation

☐ New law allows gathering of information from governmental and autonomous public entities on:

- Organizational structure
- Finances
- Archives and other documentation

☐ Law aims to make government finances and internal structures more transparent

☐ Makes data available to the public for statistical or research purposes

RAND

The new transparency law passed in 2002 might alleviate some of the issues concerning government secrecy previously discussed. Its goal is to make government structures, finances, and general processes more transparent. The new law allows the public to request information from governmental and autonomous entities on their organizational structure (e.g., number of employees, key positions, and salaries), finances (e.g., budgets, results of recent bids for proposals, granted contracts), records of any public monies or resources disbursed to individuals or organizations (e.g., results of audits, financial statements), and archives and other documentation (such as meeting minutes, statistical data, and any other information deemed relevant to the public, unless it is labeled as classified).

The passage of the new law makes it possible for individuals, researchers, and any member of the public to request and obtain such information directly from the government entity. After the passage of this law, most government entities created Web pages with links to downloadable data and documents. Furthermore, the passage of this law means that it should now be easier for researchers to gain access to the large databases SEP collects with school and student statistics.

4. OPPORTUNITIES FOR HEWLETT

Briefing Outline

- ▣ Status of Mexico's Education
 - Organization and governance
 - Funding
 - Coverage and performance
 - Key actors
 - Key issues and programs that address them
- ▣ Research on Education
- ▣ **Opportunities for Hewlett**

RAND

In assessing potential opportunities for The William and Flora Hewlett Foundation's engagement in the area of education in Mexico, we considered these criteria:

- (1) The potential for long-term national impact;
- (2) The level of investments in staff time and money that may be required; and
- (3) The William and Flora Hewlett Foundation track record in supporting and evaluating research.

Overall Assessment of Opportunities for Hewlett in Mexican Education

- ▣ **Few, if any programmatic opportunities**
 - Having an impact would be expensive
 - Most initiatives would have to be negotiated and approved by the Ministry of Education and possibly teacher's union.
- ▣ **States have little capacity (human and financial) to implement own educational programs or reforms**
 - Opportunities at the state-level are difficult to identify
- ▣ **Best prospect: Help build research and evaluation capacity to:**
 - Make system more transparent
 - Provide feedback on existing policies/programs
 - Build on Hewlett Foundation's own strengths

RAND

Our overall assessment is that there are few, if any programmatic opportunities for The William and Flora Hewlett Foundation in Mexico at the national level. Having a significant impact would require a substantial investment given the size of the education system and the achievement gap. Moreover, the Mexican government, with support from the World Bank and the Inter-American Bank, is already making significant programmatic investments (e.g., *Oportunidades*, *Enciclomedia*, and secondary school reform). Whether large or small, any programmatic initiatives would require protracted negotiations with the Ministry of Education and possibly the Teachers Union with no certainty of securing approval. This issue is all the more important in that Hewlett would be developing initial relationships with these institutions.

Similarly, we see limited potential for supporting state education initiatives. Even though states are increasingly engaged in education policy and reform, these initiatives tend to be opportunistic and short-lived. Because of high turnover in the education departments of many state governments, ideas often are not given enough time to mature or reach full implementation before a new administration comes in with its own reform plans. Furthermore, because there are no mechanisms (i.e., state Web sites, Ministry of Education newsletters or reports) to easily identify these initiatives, it is difficult to know what kinds of policy reforms or educational programs are being designed or implemented in the states without establishing personal contacts with each of them.¹⁸

¹⁸ Interviews with state education officials did not reveal many opportunities for the foundation for programmatic intervention. Overall, state-level officials agreed that poor teacher training and qualifications were important issues in their states. None of the three states we visited, however, had produced any

The best prospect for Hewlett involvement lies in helping build Mexico's policy research and evaluation capacity in education. This might involve: (1) building the country's institutional capability to engage in education policy research and increasing the number of highly-qualified analyses; (2) funding system-wide descriptions; (3) funding policy efforts and proposing evaluations; or (4) support for all three of these activities.

The overall goal of these efforts would be to encourage greater public transparency and understanding of the Mexican education system and to provide policymakers with empirically supported feedback on existing programs and policies. Such a focus lends itself to gradual investments, large and small, with the prospect of having a long-term national impact.

descriptive or other studies to confirm the status of teacher qualifications or the potential impact of training. Aguascalientes has collected longitudinal data on students and teachers, (including test scores) that might allow it to conduct more sophisticated analyses of teacher qualifications and address quality of education questions. The state, however, lacks the resources and the research capacity to make use of these data for policy analysis. Jalisco education officials emphasized the need for increased cooperation with the United States. In particular, they are trying to jumpstart an exchange program that would bring U.S. teachers to teach and train Mexican English teachers, and send Mexican teachers to the United States to train Spanish teachers there. Nuevo León has a wide range of national programs in a pilot or early phase of implementation (e.g., *Enciclopedia* and a science and technology in the classrooms program developed by a U.S.-Mexico NGO (*Fundación México-Estados Unidos para la Ciencia* (FUMEC))). The state plans to expand successful programs to the entire state, but lacks the necessary information or research to be able to identify where programs have succeeded and what conditions have allowed schools to thrive under them. One of the government's priorities is to enlist researchers and evaluators to study these programs and make recommendations to the state for scale-up efforts. Another area of policy concern in Nuevo León was how to increase cooperation with the United States, and Texas in particular, for teacher training and curriculum development.

Build Institutional Capabilities for Policy Research

- ▣ **Develop policy research institution or center**
 - Housed inside an existing university or newly established
- ▣ **Provide scholarships/fellowships for graduate studies in education outside of Mexico**
- ▣ **Support conferences on specific issues**
- ▣ **Support development of centralized access to education research and data**
 - ERIC-type search engine
 - Data warehouse

RAND

There are a number of mechanisms available for the foundation to build policy research capabilities. First, Hewlett could develop a policy research institution or center housed inside an existing university or newly established. There are advantages and disadvantages to both options. Housing it inside an existing university would utilize existing research capacity and gain immediate recognition among the academic and government communities. On the other hand, each existing institution has its own baggage or constraints that might influence the direction of the center. Establishing something new has the advantage of waiving these concerns, but does pose a challenge in terms of building name recognition, reputation, and sustainability.

Second, the foundation could offer scholarships or fellowships for international graduate studies in education. Currently, the main institution doing this is CONACYT. However, CONACYT scholarships support graduate studies in all disciplines, and are very limited in number. Offering scholarships targeted specifically for graduate studies in education that could lead to improved research policy capabilities could significantly improve the number of specialists in the field. This, admittedly, would be a more medium- to long-term strategy, but it would help build capacity in the system.

Third, through supporting dialogue and debate on education, Hewlett could help center education policy issues on the national stage, improving the quality of the current debate and providing valuable information to the public. One way to do this is to work together with Mexican universities, research centers, or business organizations to sponsor conferences with national and international specialists focusing on specific topics.

Alternatively, Hewlett could support the biannual education research conference sponsored by the Consejo Mexicano de Investigación Educativa (COMIE). The conference is attended by hundreds of teachers, school administrators, and researchers. Attendance at the conference has grown tremendously in the past years, in part because there are not many events of this type in the country. COMIE's limited funding, however, makes it difficult to bring in international specialists or disseminate conference proceedings widely.

Yet another option to help build policy research capabilities in Mexico is to support the development of a centralized point of access to education data and research. Because Mexico does not have a research reference service, such as Education Resources Information Center (ERIC) in the United States, it is difficult to track and access existing research in the country. Graduate students and researchers in the field often have to engage in "scavenger hunts" to track down current research on their topic. Effective policy research needs to build on what has already been produced. It will significantly affect the country's research capacity, therefore, to provide such information in a readily-available format.

There is no organization in Mexico, such as National Center for Education Statistics (NCES) in the United States that serves as a warehouse for education statistics and other data. Although SEP does provide some aggregate statistics through its Web site, and INEE provides some statistics on assessment on its Web site, there is no centralized point of access. The lack of a centralized point of access affects state researchers in particular. Many of the national educational programs operate at the national level, and not having access to information about these programs via the Internet, for example, puts state researchers at a disadvantage in comparison to their Mexico City counterparts.

There are existing models of centralized data points of access that Hewlett could build upon. One example is the Mexican Census Bureau, or *Instituto Nacional de Estadística, Geografía e Informática* (INEGI). In fewer than five years, INEGI has gone from providing hardcopy-only access of census and other data to having a fully-functional Web site where information can be automatically downloaded, and an excellent support and sales team where information can be custom-ordered and sent to individuals anywhere in the world. This option, however, would clearly require SEP support and close interaction with national authorities.

Fund System-Wide Descriptive Studies

▣ Distribution of educational resources across different groups and regions

- Finances
- Infrastructure and educational services
- Staff
- Outcomes and efficiency indicators

▣ Teacher qualifications and assignments

RAND

Funding system-wide descriptive studies in Mexico could fill a key gap in providing up-to-date information about the status of the educational system in the country. Presently, it is very difficult to come by even basic studies that describe issues such as attainment by urban concentration or socioeconomic status. There are few basic descriptive data on school finances and how monies are distributed and spent across the various regions of the country. Developing and disseminating such basic information would not only contribute to a better understating of the status of education in Mexico, it would also provide policymakers and advocates more comprehensive information upon which to base policy and programming decisions.

There is also a dearth of research on education supply; current research is limited to reporting the numbers of schools and teachers. More refined analyses that include breakdowns by region, socioeconomic status, or supply quality are scarce. The same is true for research on teaching staff. There is little system-wide research on teachers, their qualifications, or the proportion that are teaching out of their field. For example, the evaluation of the PARE compensatory program in 1996, which showed that teacher absenteeism was rampant in rural schools, was an excellent study highlighting an important problem (Ezpeleta and Weiss, 1996). Nonetheless, its sample size of eight schools in only two states does not provide enough evidence to generate larger-scale policy reforms.

The data needed to support system-wide descriptive studies are now mostly available, but it takes resources to conduct the research and distribute its results widely so they become a real tool for policymakers. Supporting primarily Mexican researchers to do these studies would contribute to the development of Mexico's analytical capabilities.

Fund Policy and Program Evaluations

▣ Distance Learning

- Telesecundaria model

▣ Technology in the Classroom

- Enciclomedia

▣ Teacher training programs

▣ Quality Schools program

RAND

Funding policy and program evaluations would provide valuable information for Mexican policymakers on improvement projects that are still in their early stages. Mexico has no shortage of educational programs. Currently, it is considering a large scale-up of at least four large reform initiatives: secondary school reform; preschool reform; quality schools; and technology in the classroom (*Enciclomedia*). Even though some of these programs have already been implemented in a few schools around the country, little is known about their impact. Also because none of these have strong, independent evaluation components attached, it is likely that not much more will be known before they are scaled-up at great cost to the system.

Even long-standing programs such as distance learning have only been evaluated a couple of times, and sometimes as far back as the 1970s. The numerous teacher-training programs and courses meant to deliver in-service teacher training in the country have never been evaluated. The Quality Schools program was recently evaluated, but its research design does not allow it to detect any programmatic impact on student or other outcomes. Potentially, Mexico could be investing large amounts of resources in programs that simply do not work, or work under conditions that are difficult to scale up.

Supporting implementation and outcome evaluations of ongoing initiatives holds the prospect of helping to shape educational investments in Mexico while at the same time contributing to other capacity-building efforts. The William and Flora Hewlett Foundation might decide to support.

To Have an Impact on Education, Hewlett Needs to Build a Focused, Long-Term Strategy

- ▣ **Focus on one or two areas that build on Hewlett's tradition**
- ▣ **Make a long-term commitment**
- ▣ **Cultivate relationships with key actors**
 - Particularly with the Ministry of Education
- ▣ **Work at the federal level (at least initially)**

RAND

If Hewlett is to get involved in Mexican education, it ought to be focused and prepared to invest over the long term. Mexico's system is complicated and it takes years to understand all of its inner workings. More importantly, the areas in which an international foundation like Hewlett can have the greatest effect, such as building research capacity and supporting large-scale program evaluations, are long-term investments. Many activities are not systematized, there is still a great degree of discretion exercised at all levels of government, there is a great deal of obscurity with respect to data and other information, and there exists in the education sector an overall lack of resources. It is therefore important to focus on one or two areas that can build on Hewlett's experience with, and tradition of, funding research and evaluation, and allow it to impact these complex issues in a gradual manner that builds long-term sustainability, accountability, and support within the system.

It is important to make a long-term commitment. As we saw previously, some of the organizations with the most influence in educational policy in the country (for example, the World Bank and to some extent the Ford Foundation), have been in Mexico for decades. This allows the organization to develop close relationships with institutional actors and gain the trust of the public. The latter is particularly important, as interviews with teachers, school administrators, researchers, and educational authorities revealed a degree of skepticism of new programs; many organizations that come to them with new reform ideas only remain there for a few years and then leave or switch priorities.

Doing and funding education work in Mexico requires knowing the rules of the game. SEP controls most of the education data, the results from previous evaluations, and access to the

schools. Therefore, little can be done in the way of school interventions or larger-scale research and evaluation projects without obtaining SEP's support and acquiescence. It is important to develop personal relationships with federal and state education officials. This will eventually facilitate working in the education sector and gaining access to data that, the new transparency law notwithstanding, might still remain classified, or will only be released at the government's discretion.

We recommend that Hewlett start working at the federal level, at least until the foundation is able to develop a stronger network of contacts in the country. Currently, states are constrained in their capacity (financial and technical) to implement new initiatives, or more ambitious projects. Also, leaders and personnel at the state level are in a constant state of flux, and it becomes difficult to identify opportunities and develop relationships with key actors. None of our interviewees identified any specific problems that a U.S.-based foundation was likely to face doing work in Mexico. The need for resources is so large in the country that most interviewees (state and national) were very enthusiastic about the prospects of a U.S. foundation investing in the education sector.

APPENDIX A

BACKGROUND AND STATISTICS ON MEXICAN EDUCATION¹⁹

History, Background and Context

Brief History of Mexico's Education System

Until the end of the 19th century, education in Mexico consisted of isolated efforts to provide schooling. Basic education was dominated by literacy programs sponsored by Catholic parishes, while more affluent families either sent their children to the Lancasterian school²⁰ or abroad, or hired a private tutor. Even among the rich and powerful, men benefited more than women from education. The National University, created originally in 1553 by Spanish Viceroy Luis de Velazco, had disappeared and reappeared several times since its creation. After the Independence war in 1821, Liberals and Conservatives supported either basic or higher education, respectively. Neither, once in power, was able to carry out a serious educational program because of the meager public resources and the political instability that prevailed throughout the century.

In the early 20th century, Mexican intellectuals were aware of the importance of public education for economic and social development, but little was done in practice. In response to this need, President Porfirio Díaz created the Secretariat of Public Instruction (SIP) in 1905, at a time when about 10 percent of the adult population was literate. The SIP disappeared during the Revolution (1910–1920) but became the *Secretaría de Educación Pública* (SEP) in 1921. The Revolution also established the current Constitution of 1917, in which Article Three states today's objectives of public education: lay, compulsory, and free of charge for every child.

During most of the 20th century the government's basic goal was to increase educational coverage. It faced no small challenge: a wide and scarcely integrated territory of almost two million square kilometers; poor communication systems; a fast growing population;²¹ the existence of indigenous groups in isolated areas; and low levels of instruction and poverty among the population. Today, the Mexican education system serves over 30 million students, 1.6 million teachers, and more than 229,000 schools.

Structure and System Governance

Article Three of the Mexican Constitution and the General Law of Education comprise the main legal framework regulating the Mexican education system. Article Three stipulates that all individuals have a right to receive education and that the State has an obligation to

¹⁹ This appendix is based on a background report commissioned to Valora, S.A. in Mexico.

²⁰ This system is named after two English teachers, Lancaster and Bell, who created an innovative system of inexpensive and mass tutoring, popular among governments throughout the continent at the time. The Lancasterian Company was founded in 1822 in Mexico. In 1842, the General Directorate of Public Instruction (forerunner of the current SEP) was handed over to be run by the Company for a few years.

²¹ During the 1970s, the rate of population growth reached 3.2 percent annually, the highest ever, which meant that at the time, the population doubled every 25 years.

provide basic education services and to promote all levels. The Constitution also establishes that public basic education—preschool, primary, and secondary—shall be compulsory, free of charge, and lay—that is, not guided by any religious doctrine. Education shall also be democratic, understanding democracy as a system based upon the continuous economic, social and cultural improvement of all people.

The General Law of Education (GLE), passed in 1993 and further amended in 2002, widens and reinforces the above principles. Among other things, it clarifies rights and obligations for federal and state authorities. For example, it states that it is SEP's responsibility to guarantee the national unity of basic education, improve its quality, and seek equity in the access to these services. It also establishes that it is the states' obligation to provide initial and basic education, including indigenous and special education services, as well as teacher training programs.²²

According to the GLE, the National Education System (SEN) includes the following:

- Students and their teachers
- Education authorities
- Education plans, programs, methods and didactic resources
- State education institutions and decentralized organizations
- Private institutions which have been granted official authorization (or validation) to operate education services
- Autonomous higher education institutions.

The law considers three *types* of education: basic, upper secondary (educación media superior), and higher education. Every presidential administration is required by law to present a program in each area. In education, the *Programa Nacional de Educación 2001–2006* states the main objectives, strategies and particular actions that are undertaken by the federal education authorities.²³

Size, Coverage, and Equity

The Mexican Education System (SEM) currently serves 30.8 million students at all levels. Enrollment rates in basic public institutions stand at 87.4 percent, which means that the State is by far the largest and most important supplier of education in the country. On the other hand, according to the 2000 Census about 1.7 million children ages six to 14 do not attend school. The low attendance levels are often linked to the need for new schools. A

²² All pre-service teacher training takes place in *ad hoc* institutions called *Normales*, established first in Mexico during the 19th century, and tailored after the French institutions of the same name. From 1984 on, a *normalista* degree is equivalent to a Bachelor's degree and *Normales* require higher secondary education for candidates to enroll. Universities and other higher education institutions do not train basic education teachers because of the strong control the teacher's union has over the *Normales* and, in general, all personnel who are hired in basic public education.

²³ Online at http://www.sep.gob.mx/wb2/sep/sep_2734_programa_nacional_de.

significant percentage of those children, however, live in urban areas or in places where there are schools available.

Recent demographic trends (decline in birth rates, and population growth) provide important opportunities to approach universal coverage and to increase equity and quality. Basic education—including preschool (ages three to five), primary (ages six to 12), and lower secondary levels (ages 13 to 15)—represents 78.3 percent of total enrollments. Currently, primary education enrolls 14.8 million students, which is only about 13,800 students more than it did in 2003. The trend varies among states, but on average primary education has already reached its peak in the number of enrollments and is expected to start a slight decline in the next few years (Tables 2 and 3). Lower secondary education, on the other hand, is expanding at an annual rate of about 3 percent. Higher access and lower dropout rates explain most of the growth. Currently, more than 5.8 million students receive lower secondary education. This increase is explained by the creation of more services in indigenous and rural communities.

Currently more than 3.7 million children ages three to five are enrolled in preschool, an increase of 36 percent in the last 13 years. This increase was particularly large in indigenous communities (40 percent increase in the same period) and isolated areas (with an increase of about 200 percent). Regardless of these efforts, current enrollments represent only an estimated 55.5 percent of the potential demand. If the new law making preschool compulsory is to be enforced, almost three million preschool spots have to be created in the following four years (Table 1).

Upper secondary education is one of the most dynamic levels in the school system. It currently enrolls almost 3.5 million students, 34 percent more than 10 years ago. Regardless of its expansion, drop out rates remain unacceptably high, exceeding 15.5 percent per year (Table 4). This compares negatively with the average of 6.4 percent in lower secondary and 1.3 percent in primary school (Tables 2 and 3). High dropout rates produce efficiency levels of around 61 percent—the system is missing four out of every 10 students in only three years (Table 4).

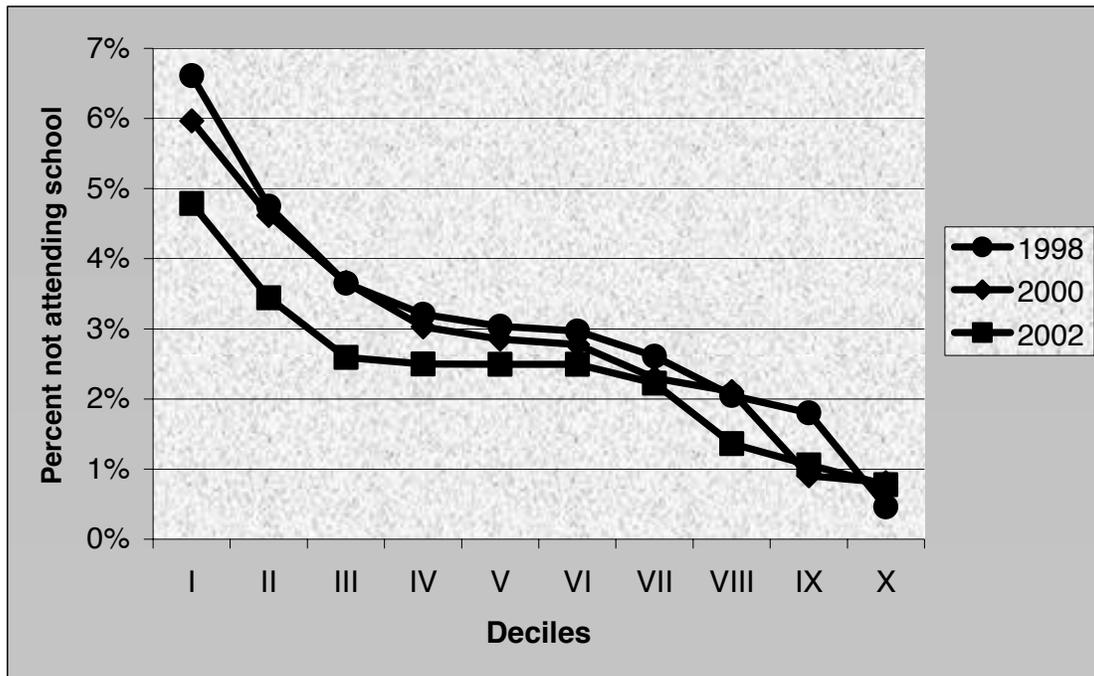
While dynamism and change have characterized the demographic trends and economic performance of contemporary Mexico, inequality remains an important social issue. Income distribution in Mexico is one of the most unequal in the world. According to the *Comisión Económica para América Latina y el Caribe* (CEPAL),²⁴ Latin America is the area of the world with the largest income disparities; Mexico and Brazil alone account for much of this problem. Currently, the Gini Coefficient is 0.537 in Mexico.²⁵ Students from different socioeconomic levels tend to receive different amount and quality of education.

²⁴ REIMERS, Fernando, *Unequal schools, unequal chances*.

²⁵ According to UNESCO-OREALC and the World Bank indicators, among others, the corresponding figure for Brazil is 0.60, Korea 0.32, USA and Canada 0.41, and Finland 0.26. Quoted by INEE, *La calidad de la educación básica en México*. The lower the value of the Gini coefficient, the lower income inequalities are.

Figure 1 shows how students from the lower deciles of income have lower school attendance rates than those from higher socioeconomic groups.

Figure 1. Population ages 6–12 not attending school, per income decile



Source: Valora Consultoría, S. C. With information from INEGI, Encuesta Nacional de Ingreso – Gasto de los Hogares 1998, 2000 and 2002

The relationship between education and social development is a strong one: available data consistently show lower rates of attendance, completion, and performance among indigenous students, isolated groups, and children living below the poverty line. Mexico has become a country where most of the population — about three quarters — is concentrated in urban areas. Twenty percent of the population (a little over 20 million) live in the metropolitan Mexico City area, while 75 percent of the country’s localities (about 200,000 in all) contain fewer than 100 inhabitants. Geographic conditions, cultural diversity, and patterns of industrialization and growth, among other factors, have contributed to this pattern of densely populated urban concentrations and numerous, small, scattered, and frequently isolated communities.

Indigenous peoples constitute a particularly vulnerable group. Their members account for slightly over 7 percent of the population ages five and older (Table 5). These six million people are by no means a homogeneous group: they speak 85 different languages and dialects, although over 52 percent of them speak *Nahuatl*, *Maya*, *Mixteco* or *Zapoteca*. Some languages, such as *Cucapá*, *Kiliwa* and *Kumiai* are on the brink of extinction.

Regional socioeconomic differences arise when we analyze coverage and performance indicators. Although per-student expenditure is mostly uniform in regular basic education schools in the country, state systems produce different completion rates, as we can observe in Chiapas, Oaxaca, Michoacán and Guerrero (Tables 6 and 7). There are even more pronounced differences within states.

Gender inequities have shown remarkable declines in recent years, although differences, particularly in higher education levels, still remain. According to the 2000 Census, in the six-to-14 cohort, women represent 49.4 percent of this population and 49.2 percent of school attendants; in the 16-to-18 cohort these percentages are 50.7 percent and 50.0 percent; and in the 20-to-24 cohort the numbers are 52.5 percent and 48.8 percent respectively. National indicators show that even though female students have higher completion rates,²⁶ they fail to continue their studies beyond basic education more often than male students (Table 7). Gender differences are mainly present in rural areas and among indigenous groups.²⁷

There are also cohort differences in educational attainment. In 2000, 53 percent of the adult population (ages 15 and over) had not completed nine years of basic education. Although this number represents an important achievement if compared to the 91 percent observed during the 1970s,²⁸ the country still has to face the effects on productivity and competitiveness of low schooling levels in its labor force.²⁹

Financial Issues

Education is by far the largest component of public spending (24 percent of programmable spending in 2003).³⁰ Among OECD countries, Mexico scores the highest.³¹ Nevertheless, the figure is misleading: since taxation is low, the government's fiscal resources are scarce and per-capita public spending in education remains low compared to international standards.

Mexico spends annually about \$42 billion on education. This includes all monetary resources that federal and state governments and families spend on education (Table 8).

²⁶ Data not provided in this document. The Oportunidades Program, as well as COMIPEMS (Comisión Metropolitana para la Educación Media Superior), have conducted a number of studies on the differential behavior of boys and girls in primary and secondary education.

²⁷ SEP, *Informe de Labores 1998-1999*. pp. 25-28.

²⁸ Presidencia de la República, *Tercer Informe de Gobierno 2003. Anexo*, pp. 137-138. Currently at 55 percent, women's score has remained four percentage points below men's.

²⁹ Completion rates of adult education programs is currently in the neighborhood of 1.5 million per year—including literacy, primary and secondary education, together with the initial, intermediate and advanced levels of the more flexible Education for Life Model—, according to CONEVYT (National Council for Life and Work). Of this total, around 360,000 at the most, finish secondary (and thus conclude their basic education).

³⁰ Presidencia de la República. *Tercer Informe de Gobierno 2003. Anexo*.

³¹ Although countries like Thailand, the Philippines and those in Sub-Saharan Africa spend a larger proportion of their public resources on education.

Family expenses include school fees for private schools, as well as other spending like purchasing textbooks, stationary, school uniforms; and transportation to and from school facilities. Private spending accounts for nearly 20 percent of the total (Table 9).

Since 1996, investment in education has increased more than GDP. Currently, national expenditures on education are estimated at 6.8 percent of GDP (public expenditures are around 5.9 percent), a figure close to the international average. The spending on education as a proportion of *per-capita* GDP, however, falls below average in basic education, while in upper secondary it almost matches the international average and in higher education it is clearly above average.³² This pattern is similar in other Latin American countries. The Mexican government spends five times as much on a higher education student as it spends on a primary education student (Table 9). This could be the result of inefficiency in higher education administration. The history of public higher education institutions in Mexico and their political activism has certainly given them considerable bargaining power (particularly those in Mexico City). On the other hand, higher education budgets must pay for costs associated with research (labs, equipment) and higher faculty costs.

Current Policy Landscape

Equity Programs for Students, Schools and Families in Target Groups

The patterns of population distribution throughout the territory, the lack of access to basic services in numerous isolated localities, the existence of more than 80 indigenous groups, and the growth rates of urban areas, among other things, entail complex social challenges that have fostered numerous initiatives to deal with the problem of poverty. These initiatives have addressed issues of coverage and access to education services. A considerable gap remains in terms of educational quality.

- *Oportunidades* (PROGRESA)

Oportunidades represents the most important demand-side social program of President Fox's administration. The program, formerly known as PROGRESA, was created in 1997 as a comprehensive approach to social policy, including education, health and nutrition. *Oportunidades* provides cash subsidies to families in poverty whose children regularly attend school and medical services. The rationale behind the program is to compensate for the opportunity cost of students while at school. Currently, the program supports over 4 million students, up from only 100,000 when established in 1997.

- *Programa Escuelas de Calidad* (Quality Schools Program, PEC)

This is probably the most important program of the Fox administration. It addresses the quality of schools *from a school- and classroom-centered perspective*, an innovation in a traditionally centralized and vertical system. PEC provides cash incentives for schools to

³² OECD. *Education at a Glance. OECD Indicators, 2002*. See Chapter B, specially Tables B1.1, B1.2, B1.3.

develop and implement their own school reform plans.³³ The resources are administered by school boards, which are required to follow strict regulations.³⁴ PEC encourages greater community and teacher participation in the school decisionmaking process, shared leadership, teamwork, flexible teaching practices, and increased accountability.

In 2003, over 15,000 schools participated in PEC. Most of them were primary schools. The program is expected to operate in 50,000 schools by the end of 2006. In 2003, the Program had a budget of \$140 million. According to SEP authorities, the main challenge for PEC is to find a financial and operational scheme to bring it to every public basic school in the country. So far, only the state of Quintana Roo has expressed its intention to universalize PEC to all schools, a goal they expect to reach in 2004-05.

PEC has been evaluated and monitored from both managerial and the pedagogical perspectives. A qualitative study carried out last year included more than 500 variables from about 2,000 schools, out of which 500 have been followed and assessed for more than two years in a longitudinal study. This is the most important qualitative evaluation of Mexican education in recent years. The study produced an enormous amount of information, which has been feeding the decisionmaking processes in the education sector.³⁵ Some of these data was shared with the schools involved in the study. PEC is outstanding for its efficient staff/beneficiaries ratio. The central office employs only about 30 people.

- The *Consejo Nacional para el Fomento Educativo* (CONAFE) and the World Bank (WB) Sponsored Compensatory Programs

Compensatory programs have been in operation in Mexico since the early 1990s. They were designed to improve educational quality and attendance for children of very poor families. Little can be expected from students without pencils or notebooks, and classrooms without blackboards or benches. The Compensatory Programs therefore focus on basic infrastructure and equipment for the schools, incentives and training for teachers, and the supply of school materials and books for students. Some emphasis has also been put on the organizational aspects of schools, such as parent and community involvement, as well as school-based planning to give the community some participation in the decision making process. Compensatory programs are also intended to reach younger children (three years and under) through courses designed for parents on child-care practices and

³³ Participation in PEC is strictly voluntary. Schools must meet certain standards to be admitted and remain in the program. The criteria may vary from one state to the other, according to internal rules and regulations.

³⁴ Among other things, school boards are not allowed to spend money on wages and salaries for teachers. Most of the money goes to infrastructure. Unlike the United States, school boards in Mexico have, so far, played a minor role in school decisionmaking and general activities. Their participation in the management of financial resources has been practically nil. Principals share this scant margin for decisionmaking and management of financial resources. Many complain that they have little time to dedicate to pedagogical tasks because of a vertical control system that highly bureaucratizes their activities (interviews with teachers and principals in the Qualitative Evaluation).

³⁵ The person responsible for the study is Dr. Armando Loera, from the *Centro de Estudios Educativos* (CEE) in Mexico City. No formal document of the ongoing research has been published yet, although some of the material has been disseminated among SEP personnel and other experts.

early education. All of these programs are operated by the *Consejo Nacional para el Fomento Educativo* (CONAFE), a department within SEP.

A few years ago, the various ongoing WB-sponsored Compensatory Programs were consolidated into the current *Program for the Reduction of the Educational Lag in Initial and Basic Education* (PAREIB), with a budget of US \$221 million per year.³⁶ The following actions were undertaken during the 2002–2003 school year:³⁷

- Four and a half million primary and lower secondary students received school materials (e.g., notebooks, pencils and colored pencils, rulers, geometry kits). Sixteen thousand primary schools and *telesecundarias* received educational materials and computers.
- The construction or rehabilitation of educational facilities, including the construction of classrooms, toilets, playgrounds, and other areas within schools. A total of 7,500 works were performed in 2003 and almost 10,000 the year before.
- Through the Redes component of the program, about 13,400 teachers received monetary incentives intended to reduce their mobility, as well as to improve the quality of teaching. Also, 122,000 teachers in 40,000 schools received technical and pedagogical feedback on behalf of the Network of Technical-Pedagogical Advisory.
- Parental organizations from more than 12,000 kindergartens and 47,000 primary schools received small amounts (around US \$500 per year) to improve school infrastructure.
- The Early Education component of the program served almost half a million parents (mostly mothers) through orientation in early stimulation and child-care techniques.
- Multicultural and indigenous education activities were undertaken.

On this last point, the regional and ethnic diversity of the country represents both an opportunity and a challenge. The multicultural nature of Mexico's society, its history, and cultural legacy, represent a true strength that must be fully acknowledged and preserved. Yet, the indigenous population remains at the bottom of the social structure, enduring extreme poverty, low schooling levels, and isolation. The basic assumption underlying policy in this area is that education can play an important role in the fight against discrimination and injustice by ensuring pertinent quality education for ethnic groups and a multicultural education for all children; that is, an education that not only bans discrimination and prejudice, but that advocates cultural diversity as a strength and an important foundation for national identity.

Indigenous education currently serves an estimated 1,165,000 students—73 percent of them in primary school and 27 percent in preschool—with 48,500 teachers in about 18,400

³⁶ Estimated for the year 2003, from Presidencia de la República, op. cit., considering 10.6 pesos per dollar.

³⁷ SEP. *Informe de labores 2002-2003, septiembre de 2003*. México, p. 13.

schools. Through programs sponsored by WB loans and under the umbrella of compensatory programs, SEP has translated primary education textbooks into 55 different indigenous languages and dialects.

Indigenous education faces several difficulties, which are reflected in its poor indicators. For instance, terminal efficiency for the modality, estimated in 75.8 percent, is more than 12 percentage points below the national figure of 88 percent.³⁸ Moreover, students of these groups rank in the lowest tiers in standardized tests.³⁹ Challenges on the supply side include extreme isolation and marginality of some communities, insufficient financial resources, unavailability of teachers for different dialects, poor infrastructure, inadequate teacher training, and overlapping responsibilities of the agencies involved. On the demand side, challenges include the frequent oral nature of dialects implying serious pedagogical and practical difficulties, the need to use more than one language or linguistic variant in a single classroom, and the seasonal migration of families in search of work that prevents children from attending school regularly.⁴⁰

Indigenous schools were decentralized in 1992, but the responsibility over the curricula remained federal. The General Direction of Indigenous Education at SEP is in charge of the policy design and the development of textbooks and materials. With more than 400 employees, this is one of the largest units in SEP. In 2001, a General Coordination for Bilingual Intercultural Education (CGEIB) office was created within SEP, reporting directly to the Minister.⁴¹ The CGEIB consists of a small team of experts who promote and coordinate cross-institutional activities. Its objective is to disseminate the importance of cultural diversity, tolerance, and nondiscriminatory practices in schools, as well as to ensure quality education to indigenous students in no indigenous institutions (secondary and tertiary schools included).

During 2003–04, the CGEIB implemented a pilot program for migrant urban indigenous children who attend regular schools in Mexico City. The program currently operates in 70 schools at the preschool and primary levels.

- Programs for other vulnerable groups: special needs and migrant children, students in multi grade schools, and homeless children

Several SEP initiatives focus on the needs of specific groups: those with physical disabilities, or learning difficulties; extreme poverty; special education needs and different capacities; seasonal migrant workers' families; and street children. In 2002, a *Program for the Improvement of Special Education* was implemented as a joint effort between SEP and

³⁸ SEP, *Informe de labores 2002-2003*, 1 de septiembre de 2003, México, pp. 11 and 14.

³⁹ According to INEE data from the Standards Test, as well as other surveys and tests, indigenous education students are usually the lowest ranking group.

⁴⁰ Scholars such as Fernando Benitez and Pablo Latapí have often referred to the limited negotiation capacity of indigenous groups as stakeholders, as compared to other urban and better-organized groups. There are of course exceptions, such as the Chiapas movement.

⁴¹ CGRIB was created by presidential decree and its Coordinator reports directly to the Minister.

the President's office. The program is intended to articulate ongoing efforts to support students with special educational needs and their integration into regular schools, and to ensure quality instruction to people with physical handicaps and learning difficulties. Integration efforts also aim to educate all children to understand and appreciate people with different capabilities.

At present, an estimated 440,000 children with special education needs, including physical disabilities, receive basic education. A total of 4,246 centers for special education offer two types of services, The *Centros de Atención Múltiple* (CAM) serve students whose handicaps prevent them from attending regular schools, and integrate children with different sorts of handicaps and educational needs in comprehensive classrooms. There are 1,516 CAM from preschool to secondary levels. The *Unidades de Servicio para Apoyar la Educación Regular* (USAER) provide counseling services and technical advice to teachers, parents, and staff in schools that integrate special-needs students into regular classrooms or have separate special education groups. A total of 2,730 USAER exist in the country. It is fair to say that teachers and staff committed with integration are not mainstream yet, and that, in general, a degree of prejudice against integration still prevails. On the other hand, it is also the case that the demand for the creation of new USAER cannot always be met.

The *Primary Education Program for Migrant Children* was implemented by SEP in 1997 as an innovative pedagogical and organizational model designed to facilitate educational services for the children of seasonal migrant workers who travel around the country in search of job opportunities in the agricultural sector. The Program offers primary education to 16,000 children in 459 sites in 16 states. The challenge posed by seasonal migrant workers is perhaps one of the most complex and difficult to address: migration patterns are far from being predictable and straightforward; whole families and communities travel together and stay in camp sites beside their working place; children are hard to trace if they work in the camps (given the illegal nature of that practice); and, often they lack basic documents, including school grades, certificates, and identity cards. Frequently, there are non-Spanish speakers from various indigenous groups among the migrant workers. From an organizational perspective, serving this population requires the collaboration of multiple groups and institutions: employers and owners of the fields; authorities from both the origin and destination states of workers; parents and families themselves; and the schools where children come from, and are likely to return to, after the migration cycle ends. In addition to SEP, institutions involved in this program include CONAFE, SEDESOL, and the adult education agency (INEA), which offers literacy and basic education programs. CONAFE covers 3,000 children in preschool and more than 5,400 in primary education with an academic model customized for these groups. The SEP, through the CGEIB, coordinates the institutions involved in the Program to articulate efforts and improve the services rendered. The Program receives funding from the Mexico-Spain Joint Fund.

Multi-grade schools represent an alternative for isolated areas where the number of school-age children makes it impossible to assign one teacher per grade. Often, a single teacher serves all primary school students. One in four basic education schools in Mexico is a

multi-grade school. This particular arrangement demands a different kind of teaching, as well as special training and materials for the educator. Although multi grade schools have been operating for a number of years and experience has been acquired, it is generally agreed that a different *pedagogical approach* is needed. A team at SEP is currently carrying out intense research to design a special model, expected to be ready for implementation by 2006.

Homeless children represent another important challenge for the educational sector. According to the National System for the Integral Development of the Family (DIF), there are about 130,000 *homeless children living in the streets* in Mexican cities. The problem is growing and several causes have been identified. Once children live on the streets, it becomes very hard to bring them back to a normal, productive life. The solution certainly requires a multidisciplinary approach, but education has a very important role in the solution and prevention of the problem. During the 2002–2003 school year, SEP evaluated ongoing projects in Mexico City and Guadalajara, in order to identify possible guidelines for a nationwide proposal. The focus is on preventive action.

- Teacher training programs

As of 1996, a program for the improvement of pre-service teacher training was established. It consists of a curricular reform of *Normales* (teachers' colleges), an allocation of resources to improve infrastructure in these institutions, and an effort to modernize them and foster organizational and academic reforms. *Normales* have college-level programs for preschool, primary and secondary teachers, as well as special and physical education. There are currently about 156,000 students enrolled in this modality of higher education. This number is likely to decrease in the future as primary level enrollments stabilize.

The *National Program for the Continuous Updating of Basic Education Teachers (PRONAP)*, established in 1996, is SEP's main instrument to improve the knowledge and skills of in-service teachers. PRONAP is an umbrella program that includes the following:

Cursos Nacionales de Actualización (national professional development courses): These are self-instructional study courses of approximately 120 hours each, aimed at enhancing teachers' competencies and knowledge of specific subject matters. They are also intended to introduce teachers to modern teaching techniques, assessment, pedagogy, and best practices in the field they chose. Participation is voluntary. Some national courses are also available online. It is estimated that almost 590,000 primary and lower secondary teachers are currently registered in at least one of the courses. Over 260,000 teachers take exams to earn credits for these courses every year, and approximately half obtain a satisfactory result. Although the courses can be considered successful in terms of the number of teachers involved and their scores in the resulting examinations, there is concern among authorities and experts that good results do not seem to have a significant impact on teaching practices or on student outcomes.⁴²

⁴² Interview with Alba Martínez Olivé, head of PRONAP.

Talleres Generales de Actualización (professional development workshops): These provide participatory experiences in each school for teachers to analyze and discuss classroom practices. The specific contents of the workshops vary from year to year. All teachers in basic education are expected to attend the General Workshops every year. The workshops usually take about 20 to 28 hours—12 hours shortly before the school year starts, and the rest throughout the year. Recent efforts to improve the workshops include a search for wider participation of states in the determination of their contents and the design of the corresponding materials.

Cursos Estatales de Actualización (state professional development courses): States deliver their own courses for teachers in addition to the national ones. Courses range from 30 to 60 hours. Central SEP in Mexico City must authorize state courses before they are delivered. Although the authorization process implies a considerable amount of work for SEP, this effort has proven to be a sound mechanism to regulate the supply and quality of such courses.

Cursos Generales de Actualización (general professional development courses): These courses designed by different public agencies —e.g., the Federal Electoral Institute, the Ministry of Health —with the assistance of SEP are offered to teachers who want to increase their knowledge on specific topics. Currently, eighteen courses are offered.

Centros de Maestros (teachers' centers): These centers offer a space devoted to the updating, in-service training, and counseling of teachers, in order to achieve better teaching practices in schools. They are endowed with libraries, computers with Internet access, classrooms, and study areas. There are currently more than 500 centers throughout the country, and their creation and operation involves federal and state participation. Their efficiency has often been the topic of much debate among teachers and educational authorities. The centers are designed to receive teachers, but not to reach out to them. Teachers teaching double shifts—a common situation in Mexico—find it impossible to visit the centers. So far, the impact of the centers varies widely among states, depending on the commitment level of teachers and local authorities.

- *Carrera Magisterial* (national teacher incentive program)

This program was established in 1992 as part of the basic education reform. Its goal is to improve teacher salaries through a competitive process that evaluates teachers and their students. Before the program started, teachers could only receive promotions by entering school administration. Quality teaching, experience, and professional development were not acknowledged in the promotion structure, and teachers had no incentives to improve their performance.

Participation in the *Carrera* program is voluntary. After signing up for participation, teachers must take one exam, and take a certain number of professional development courses. Currently, more than 700,000 participate in the program.

- *Programa Nacional de Lectura* (National Program for Reading)

The program fosters reading and literacy among basic education students through a wider involvement of teachers and students in both leisure and informative reading practices. For these purposes, a major effort to produce and distribute reading material to schools and classrooms has been undertaken. During the 2002–2003 school year, more than 28 million books were produced and distributed to the 815,000 classrooms of every public primary and secondary school. Each classroom receives a collection of books —27 on average every year— on grade- and age-appropriate topics. An additional set of books is delivered to each school for the school library. The scope of topics is wide; variety and balance is pursued during the selection process.

The national reading program has yet to be fully implemented. Because of budget restrictions, the program has focused so far on the selection, production, and distribution of reading materials. However, there is a shared concern about the need to work more closely with schools to ensure a good and pedagogically sound use of the collections. The program has a central office staff of about 15 people who have a close coordination with the local teams at each state. Like most projects and activities that require federal-state coordination, the size and dynamism of the state teams depends on the interest and commitment of local authorities to the program.

- Programs for Citizenship Education

Citizenship education is a recent concern of federal education authorities in Mexico. During the former administration, first steps were taken through the implementation of a Civics and Ethics Program designed for lower secondary students, along with some materials distributed in primary schools.⁴³ In 1999, this topic was introduced as a compulsory subject matter in all three grades of lower secondary education. A study of the implementation of these courses has been recently undertaken,⁴⁴ and its findings are expected to feed the curricular and organizational reform of lower secondary that is being carried out by SEP.

Two more projects address education for citizenship: the Civics and Ethics Integral Program for Primary Education, and the Culture of Legality project. They are intended to promote active citizenship, rather than the simple teaching of concepts and definitions, and to encourage the enactment of values and generate moral autonomy among students.

⁴³ A children's edition of the National Constitution for fourth to sixth graders.

⁴⁴ A qualitative research project comprising observations registered in actual Civics and Ethics classes within various types of *Secundaria* schools was carried out last year by the Centro de Estudios Educativos (CEE), consultant to the Ministry. The results have not been published.

The *Civics and Ethics Integral Program*'s objectives are to include civics and ethics as a part of the curriculum in all six grades of primary education,⁴⁵ generate a different approach for teachers to interact with students in the classroom, and include the analysis of democratic values. A number of extracurricular activities are carried out at schools to complement the children's formation of values and democracy. Currently, the program is implemented in selected schools in 10 states, on an experimental basis, and is expected to become fully operational by the end of 2006. The program runs a yearly budget of US \$180,000. Most states already operate similar programs and these are expected to serve as a basis for the implementation of the national program. The central office has a very small staff of about four to five people, who are currently developing the new curricular contents and monitoring the pilot study.

The *Culture of Legality Program* began in 1998 as a joint project between the San Diego and the Tijuana education authorities in a handful of schools, and subsequently sponsored by the National Strategic Information Center (NSIC) in Washington, D.C. It was based on a similar program implemented in Hong Kong and Palermo, which resulted in a dramatic decrease of corruption and crime in both cities. Today, it operates in six states of Mexico. The central activity of the program is a workshop for third grade lower secondary students attended by about 88,000 third grade secondary students in more than 500 schools. The project is expected to expand nationwide and serve at least 20 major urban areas in Mexico by 2006. Until last year, the program had a staff of 10 people. It runs an annual budget of about US \$150,000.

- Distance Education and the Use of ICT in Education

Some initiatives use digital technology and satellite communications to expand the use of technology in education and improve access of marginal populations to education. The three largest initiatives are: *Telesecundaria*, the Satellite Television Network (EDUSAT); the School Network of Educational Computer Science (*Red Escolar*); and *Enciclomedia*.

Originated in the 1960s, the *Telesecundaria* project has been one of the most successful examples of the appropriate use of technology in the service of education. It has been the solution for many young people from isolated and small localities who would have otherwise lacked the opportunity to continue lower secondary studies. Currently, it serves one-fifth of total lower secondary enrollments, about 1.2 million students. It operates through the *Edusat* network (see below). The model has been replicated in a few Latin American countries, including Venezuela, Colombia and Peru, through the sponsorship and guidance of the IDB and the Mexican authorities. A variant of the *Telesecundaria* model has been developed for upper secondary (*educación media a distancia* or *telebachillerato*), which is attended by about 25,000 students in 300 localities.

⁴⁵ Currently, students receive Civics education as part of the social sciences area of study.

The *Edusat* project is a TV network, which operates in 30,000 schools and other educational facilities (such as *Normales*, *Telesecundaria* and Teachers' centers). *Edusat* includes 12 video channels (including Discovery Kids and History Channel), along with a few audio channels. Some of *Edusat*'s programming can be downloaded through the Internet.⁴⁶ More than 900 programs were produced in 2003 alone. Total transmission time is estimated at about 44,000 hours per year. Programming includes teacher training material, *Telesecundaria* programs, entertainment, and information, among others.

The *Red Escolar* started in 1997 as a pilot project, and currently operates in about 10,000 schools. It is intended to promote the participation of students, teachers and sometimes their parents in the use of new technologies applied to education. It aims to improve the teaching and learning processes, and foster the exchange of information among participating schools throughout the country. Using technology, students and teachers develop collaborative projects related to various subjects. For instance, they participate in reading and writing contests, puzzles, and team research. Participating school teams are equipped with the proper systems, and receive technical and pedagogical support from local and federal authorities.

The most recent project in this category is *Enciclomedia*. This project is being developed with the sponsorship of IDB and consists of the digitalization process of primary education textbooks in CD-ROM format. Along with the material from the textbooks themselves, a plethora of resources, including videos, complementary information and the use of the Microsoft Encarta student encyclopedia, are available to teachers and students. The system began as a pilot in the 2003–04 year, and is expected to expand to thousands of schools during 2005.

⁴⁶ See <http://dgtve.sep.gob.mx>

Table 1. Preschool Enrollment and Coverage (2003–2004)^e

STATES	3 YEAR OLDS		4 YEAR OLDS		5 YEAR OLDS		3 TO 5 YEAR OLDS	
	<i>Enrollment</i>	<i>Coverage %</i>						
National	513,039	24.8	1,387,724	65.4	1,811,567	83.5	3,725,171	55.5
Aguascalientes	3,707	16.7	14,741	64.8	18,846	81.1	37,408	52.8
Baja California	4,966	8.6	26,441	45.1	50,289	84.3	81,811	44.9
Baja California Sur	662	7.1	7,908	82.8	9,371	96.5	17,960	61.5
Campeche	331	2.1	12,024	74.3	14,368	87.1	26,782	53.6
Coahuila	10,044	20.4	35,079	69.8	48,685	95.4	94,266	60.2
Colima	2,170	20.7	8,539	79.3	10,522	94.5	21,342	63.2
Chiapas	54,946	56.2	71,025	70.6	93,988	90.8	221,214	68.9
Chihuahua	12,641	19.0	36,988	54.4	52,166	75.1	102,056	46.8
Distrito Federál	55,836	40.5	113,886	80.9	121,698	85.0	295,040	66.0
Durango	2,245	7.0	20,347	61.7	29,932	88.8	52,538	51.4
Guanajuato	25,535	23.1	81,557	72.1	106,139	92.4	213,939	60.8
Guerrero	27,377	36.8	48,423	63.2	68,409	86.5	144,425	60.3
Hidalgo	12,483	26.5	34,604	71.1	32,826	65.5	80,173	53.1
Jalisco	43,608	32.3	98,210	71.1	106,109	75.5	248,105	56.6
Estado de México	36,458	13.4	151,893	54.6	199,580	70.2	388,146	41.7
Michoacán	9,217	10.7	53,231	59.5	81,617	89.0	144,224	52.0
Morelos	4,516	14.1	17,795	53.8	29,072	85.5	51,478	49.1
Nayarit	2,190	11.4	14,433	73.7	18,347	92.0	34,979	58.3
Nuevo León	21,373	27.1	57,685	72.1	72,450	90.2	153,043	58.1
Oaxaca	26,204	33.8	52,873	66.1	66,923	81.2	146,766	58.1
Puebla	42,921	38.3	71,219	61.7	96,963	81.6	211,717	58.3
Querétaro	5,975	18.7	22,795	69.5	32,729	97.4	61,877	60.9
Quintana Roo	3,158	14.7	13,808	63.1	20,800	92.8	37,973	55.2
San Luis Potosí	18,110	35.7	37,548	71.6	48,108	89.3	103,874	63.2
Sinaloa	9,420	17.7	38,656	70.9	46,702	83.9	95,003	55.5
Sonora	3,556	7.4	27,786	56.8	47,527	95.9	79,004	52.3
Tabasco	23,716	58.6	34,018	81.8	39,917	93.3	97,677	74.5
Tamaulipas	4,935	8.3	32,973	54.4	52,778	86.4	91,069	48.1
Tlaxcala	1,055	5.1	11,815	55.6	21,819	99.6	34,879	58.5
Veracruz	17,969	13.2	90,276	64.4	119,167	82.4	227,536	51.6
Yucatán	14,846	44.8	27,602	81.1	26,894	77.1	69,559	63.2
Zacatecas	10,869	36.4	21,546	70.1	26,826	85.7	59,308	61.8

SOURCE: SEP, General Directorate of Planning, Programming and Budget (DGPPyP).

NOTES:

e/ Estimated data.

Table 2. Primary Enrollment and Coverage (2003–2004)^e

STATES	ENROLLMENT					Coverage ¹ %	EFFICIENCY RATES		
	2003-2004	DIFFERENCES					Repetition %	Dropout %	Terminal Efficiency ² %
		DECADE 2003-1993		ANNUAL 2003-2002					
		Total	%	Total	%				
National	14,878,411	408,961	2.8	21,220	0.1	93.1	5.0	1.3	89.7
Aguascalientes	154,021	19,205	14.2	-384	-0.2	92.5	3.4	1.0	93.8
Baja California	374,074	98,820	35.9	7,541	2.1	90.2	3.8	0.7	93.0
Baja California Sur	65,154	11,689	21.9	1,459	2.3	95.5	3.5	0.3	97.2
Campeche	108,231	2,562	2.4	1,401	1.3	90.2	7.4	1.2	87.2
Coahuila	334,006	24,398	7.9	3,441	1.0	90.8	2.3	1.6	89.7
Colima	76,750	2,908	3.9	85	0.1	90.3	4.1	1.7	90.4
Chiapas	788,715	129,189	19.6	16,354	2.1	101.4	9.4	2.2	80.6
Chihuahua	441,257	33,207	8.1	-1,856	-0.4	89.7	5.1	1.8	86.1
Distrito Federal	993,465	-90,123	-8.3	-9,093	-0.9	94.7	1.8	0.4	94.0
Durango	228,671	-10,827	-4.5	146	0.1	91.9	4.4	1.0	89.0
Guanajuato	755,840	-18,827	-2.4	2,112	0.3	91.5	5.3	1.4	90.5
Guerrero	570,967	20,601	3.7	7,429	1.3	97.0	8.8	2.4	79.3
Hidalgo	361,990	-12,310	-3.3	-9,359	-2.5	96.6	5.0	1.2	95.5
Jalisco	928,114	-44,699	-4.6	-3,172	-0.3	91.5	3.7	1.3	89.5
Estado de México	1,925,227	125,762	7.0	-4,131	-0.2	91.5	3.3	0.8	93.2
Michoacán	650,052	-47,659	-6.8	-5,650	-0.9	94.5	6.1	1.4	85.7
Morelos	223,587	10,611	5.0	1,923	0.9	87.8	3.0	0.6	93.6
Nayarit	131,134	-15,079	-10.3	244	0.2	87.0	3.1	0.8	90.1
Nuevo León	497,707	33,322	7.2	10,391	2.1	89.0	2.2	0.5	95.3
Oaxaca	639,713	2,800	0.4	1,896	0.3	100.6	9.6	1.9	84.4
Puebla	833,011	38,118	4.8	3,324	0.4	92.0	5.7	0.9	90.2
Querétaro	232,190	20,374	9.6	1,383	0.6	92.7	4.9	0.8	97.0
Quintana Roo	146,932	44,281	43.1	3,343	2.3	92.6	5.8	1.0	95.1
San Luis Potosí	371,119	4,342	1.2	-2,314	-0.6	92.5	5.3	0.9	93.9
Sinaloa	368,006	-8,596	-2.3	3,665	1.0	88.7	5.9	3.1	83.5
Sonora	319,755	18,384	6.1	921	0.3	91.8	3.0	1.2	90.4
Tabasco	301,815	-1,199	-0.4	-1,018	-0.3	93.6	5.5	0.9	89.0
Tamaulipas	392,336	50,247	14.7	4,912	1.3	91.7	3.2	0.5	97.8
Tlaxcala	154,749	11,317	7.9	1,018	0.7	93.6	2.5	0.4	99.9
Veracruz	1,059,789	-10,904	-1.0	-8,314	-0.8	95.0	7.0	1.8	85.5
Yucatán	249,174	2,413	1.0	-2,468	-1.0	95.9	7.8	1.7	87.6
Zacatecas	200,860	-35,366	-15.0	-4,009	-2.0	89.2	3.6	1.2	92.1

SOURCE: Produced with data from SEP, General Directorate of Planning, Programming and Budget (DGPPyP).

NOTES:

e/ Data for the 2003-2004 school-year is estimated.

1/ Gross coverage indicators may produce figures above 100 percent, since they consider *total* number of enrolled students (regardless of their age) and divide them by total population of corresponding age cohort. States or communities with high proportion of repetition rates or numerous elder students (beyond expected grade ages) present this situation. Such is the case of Chiapas and Oaxaca.

2/ Number of students expected to finish primary education (sixth grade), during current school year, by number of newcomers to first grade of primary, six years ago (1998-1999).

Table 3. Lower Secondary Enrollment and Coverage (2003–2004)^e

STATES	ENROLLMENT					Coverage1 %	Inclusion Rate2 %	EFFICIENCY RATES	
	2003-2004	DIFFERENCES						Dropout %	Terminal efficiency ³ %
		DECADE 2003-1993		ANNUAL 2003-2002					
		Total	%	Total	%				
National	5,813,216	1,471,292	33.9	153,146	2.7	85.6	95.4	6.4	80.1
Aguascalientes	62,840	21,753	52.9	3,438	5.8	89.1	98.2	6.8	79.0
Baja California	143,391	51,668	56.3	6,924	5.1	84.9	97.5	6.6	79.6
Baja California Sur	26,127	5,815	28.6	638	2.5	93.1	99.5	4.2	86.6
Campeche	41,365	13,626	49.1	478	1.2	84.3	96.5	8.0	75.5
Coahuila	133,800	22,268	20.0	227	0.2	92.0	99.5	5.9	82.2
Colima	31,462	7,174	29.5	6	0.0	85.9	99.9	6.2	80.8
Chiapas	251,966	130,609	107.6	13,921	5.8	77.7	90.4	4.9	84.2
Chihuahua	163,622	48,035	41.6	6,287	4.0	79.6	91.6	7.6	76.6
Distrito Federal	481,969	-31,782	-6.2	-1,935	-0.4	105.3	103.9	5.6	83.1
Durango	89,597	20,311	29.3	3,273	3.8	83.2	94.5	7.1	77.7
Guanajuato	274,172	90,713	49.4	8,143	3.1	79.0	91.7	8.2	74.7
Guerrero	182,115	55,826	44.2	4,520	2.5	77.0	90.1	10.6	68.2
Hidalgo	154,390	44,409	40.4	1,829	1.2	95.1	95.7	4.8	84.9
Jalisco	364,470	91,730	33.6	7,891	2.2	83.5	93.8	8.6	73.7
Estado de México	789,624	206,222	35.3	29,057	3.8	85.7	95.8	6.0	81.2
Michoacán	236,666	76,474	47.7	7,635	3.3	77.9	90.6	8.3	74.5
Morelos	94,064	20,143	27.2	1,524	1.6	88.6	99.4	3.0	90.2
Nayarit	56,805	7,446	15.1	-377	-0.7	88.9	97.8	4.5	85.6
Nuevo León	207,700	21,048	11.3	4,018	2.0	90.5	99.4	3.1	89.7
Oaxaca	217,056	81,361	60.0	5,082	2.4	80.6	92.4	6.8	78.8
Puebla	308,392	101,333	48.9	12,337	4.2	79.7	90.8	5.8	81.8
Querétaro	91,132	32,332	55.0	2,276	2.6	86.5	95.7	7.7	76.4
Quintana Roo	55,693	27,969	100.9	2,682	5.1	86.6	100.1	6.3	80.5
San Luis Potosí	149,865	41,769	38.6	3,581	2.4	89.3	94.5	6.2	80.7
Sinaloa	140,510	11,829	9.2	-3,677	-2.6	84.4	99.5	6.2	80.5
Sonora	124,187	13,473	12.2	4,140	3.4	85.5	97.7	6.4	80.2
Tabasco	130,106	37,060	39.8	2,867	2.3	93.2	98.5	5.3	83.2
Tamaulipas	155,342	36,679	30.9	5,453	3.6	87.7	94.6	5.4	83.1
Tlaxcala	62,927	13,154	26.4	3,391	5.7	87.3	96.1	5.0	84.1
Veracruz	400,978	105,841	35.9	14,354	3.7	82.0	94.5	6.1	80.9
Yucatán	102,911	36,144	54.1	2,674	2.7	90.1	100.0	6.3	80.6
Zacatecas	87,972	28,860	48.8	489	0.6	90.4	94.6	8.1	75.2

SOURCE: SEP, DGPPyP.

NOTES:

1/ Gross coverage indicators, as the above, may produce figures beyond 100 percent, since they consider *total* number of enrolled students and divide them by total population of corresponding age cohort. Such is the case of states or communities with high proportion of repetition rates or numerous students beyond expected grade ages.

2/ Equivalent to primary education graduates (finished sixth grade), from the former year, divided by newcomers to first grade of lower secondary in current school year (2003–2004).

3/ Number of students expected to finish lower secondary (third grade of secondary, equivalent to year nine, U.S.), during current school year, by number of newcomers to first grade, three years ago (2001–2002).

Table 4. Upper Secondary Enrollment and Coverage (2003–2004)^e

STATES	ENROLLMENT					Coverage ¹ %	Inclusion Rate ² %	EFFICIENCY RATES	
	2003-2004	DIFFERENCES						Dropout %	Terminal efficiency ³ %
		DECADE 2003-1993		ANNUAL 2003-2002					
		Total	%	Total	%				
National	3,479,231	1,235,097	55.0	183,959	5.6	51.5	96.0	15.5	61.0
Aguascalientes	34,434	14,936	76.6	1,681	5.1	52.0	98.4	16.7	60.8
Baja California	81,477	32,399	66.0	6,847	9.2	47.5	96.6	17.3	57.1
Baja California Sur	18,893	4,400	30.4	1,026	5.7	66.2	110.0	18.2	56.0
Campeche	26,797	10,227	61.7	860	3.3	55.3	106.4	17.8	55.3
Coahuila	80,596	25,788	47.1	5,274	7.0	53.9	101.8	18.1	58.2
Colima	19,922	7,055	54.8	1,121	6.0	52.4	97.0	15.6	61.3
Chiapas	148,743	88,159	145.5	19,651	15.2	44.8	93.6	9.8	73.0
Chihuahua	100,791	44,038	77.6	5,730	6.0	50.4	111.7	19.4	55.6
Distrito Federál	404,859	17,174	4.4	-2,649	-0.7	86.5	120.9	19.9	51.4
Durango	54,660	17,471	47.0	2,903	5.6	52.0	103.5	18.1	55.3
Guanajuato	141,765	76,163	116.1	6,996	5.2	41.7	90.5	18.1	56.5
Guerrero	97,114	24,251	33.3	3,491	3.7	43.8	96.9	14.5	63.3
Hidalgo	88,000	47,734	118.5	7,788	9.7	53.4	89.4	18.0	57.0
Jalisco	205,310	60,740	42.0	9,707	5.0	47.0	84.1	8.9	73.0
Estado de México	407,723	186,997	84.7	28,729	7.6	43.7	85.0	16.5	59.0
Michoacán	116,554	46,708	66.9	10,935	10.4	37.7	82.1	11.3	70.1
Morelos	63,122	26,987	74.7	3,884	6.6	58.8	99.1	17.4	61.1
Nayarít	35,134	7,355	26.5	1,320	3.9	54.0	91.1	15.9	63.2
Nuevo León	120,553	23,876	24.7	2,100	1.8	52.5	98.6	21.2	56.2
Oaxaca	123,978	61,523	98.5	9,455	8.3	45.3	92.7	16.8	58.3
Puebla	179,729	79,288	78.9	13,172	7.9	47.4	91.1	10.0	72.9
Querétaro	49,442	19,110	63.0	2,931	6.3	47.0	91.2	17.9	53.2
Quintana Roo	32,649	16,962	108.1	2,254	7.4	50.7	101.9	17.4	55.7
San Luis Potosí	72,229	33,328	85.7	3,938	5.8	44.7	80.3	14.9	65.2
Sinaloa	112,853	20,424	22.1	1,718	1.5	66.0	111.0	16.2	57.7
Sonora	86,819	16,374	23.2	2,312	2.7	62.1	109.5	17.6	57.0
Tabasco	90,420	29,102	47.5	3,900	4.5	64.8	98.9	9.0	75.2
Tamaulipas	96,613	34,894	56.5	4,028	4.4	54.6	99.0	12.3	67.3
Tlaxcala	38,129	11,077	40.9	1,228	3.3	55.6	94.8	13.5	65.1
Veracruz	244,352	99,613	68.8	14,849	6.5	50.3	97.6	13.6	64.8
Yucatán	64,885	31,842	96.4	3,453	5.6	56.3	102.6	18.4	53.8
Zacatecas	40,686	19,102	88.5	3,327	8.9	40.6	76.7	14.5	62.9

SOURCE: SEP, DGPPyP.

NOTES:

1/ Gross coverage indicators, as the above, may produce figures beyond 100 percent, since they consider *total* number of enrolled students and divide them by total population of corresponding age cohort. Such is the case of states or communities with high proportion of repetition rates or numerous students beyond expected grade ages.

2/ Equivalent to secondary education graduates, from the former year, divided by newcomers to first grade of higher secondary in current school year (2003–2004).

3/ Number of students expected to finish higher secondary (year 12, U.S.), during current school year, by number of newcomers to first grade, three years ago (2001–2002).

Table 5. Selected Socio-economic and Demographic Indicators (2002 and 2003)

STATES	POPULATION 2003 ^e			INDIGENOUS POPULATION 2000 ¹		MARGINALITY RATE ³ %	HUMAN DEVELOPMENT INDEX ⁴
	TOTAL (thousands)	Urban %	Rural %	TOTAL (nr. of persons)	% ²		
National	104,213.5	75.3	24.7	6,044,547	7.2	--	0.791
Aguascalientes	1,012.1	81.0	19.0	1,244	0.2	-0.97	0.820
Baja California	2,786.9	92.0	8.0	37,685	1.9	-1.27	0.822
Baja California Sur	476.7	82.1	17.8	5,353	1.4	-0.80	0.817
Campeche	750.1	71.9	28.1	93,765	15.5	0.70	0.815
Coahuila	2,478.1	89.6	10.4	3,032	0.2	-1.20	0.828
Colima	576.7	86.2	13.8	2,932	0.6	-0.69	0.806
Chiapas	4,295.7	67.8	53.1	809,592	24.7	2.25	0.693
Chihuahua	3,313.2	83.2	16.7	84,086	3.2	-0.78	0.819
Distrito Federál	8,813.3	99.8	0.2	141,710	1.8	-1.53	0.871
Durango	1,542.9	65.1	34.9	24,934	2.0	-0.11	0.790
Guanajuato	4,986.3	68.0	32.0	10,689	0.3	0.08	0.761
Guerrero	3,236.3	55.7	44.3	367,110	13.9	2.12	0.719
Hidalgo	2,350.7	50.8	49.2	339,866	17.3	0.88	0.748
Jalisco	6,700.2	85.0	15.0	39,259	0.7	-0.76	0.801
Estado de México	14,217.5	86.9	13.1	361,972	3.3	-0.60	0.789
Michoacán	4,198.6	66.2	33.8	121,849	3.5	0.45	0.749
Morelos	1,678.7	86.4	13.6	30,896	2.3	-0.36	0.789
Nayarit	984.4	65.7	34.2	37,206	4.6	0.06	0.767
Nuevo León	4,112.6	93.5	6.5	15,446	0.5	-1.39	0.842
Oaxaca	3,668.5	45.4	54.7	1,120,312	37.2	2.08	0.706
Puebla	5,422.6	69.1	30.9	565,509	13.1	0.72	0.758
Querétaro	1,544.0	69.4	30.6	25,269	2.1	-0.11	0.802
Quintana Roo	1,014.7	83.6	16.4	173,592	23.1	-0.36	0.820
San Luis Potosí	2,386.7	60.0	40.0	235,253	11.7	0.72	0.767
Sinaloa	2,722.8	67.9	32.1	49,744	2.2	-0.10	0.783
Sonora	2,409.8	83.5	16.5	55,694	2.9	-0.76	0.818
Tabasco	2,021.0	55.1	44.9	62,027	3.7	0.66	0.766
Tamaulipas	3,048.4	86.1	13.9	17,118	0.7	-0.69	0.803
Tlaxcala	1,038.8	80.8	19.2	26,662	3.2	-0.18	0.763
Veracruz	7,251.3	59.4	40.6	633,372	10.4	1.28	0.744
Yucatán	1,760.7	82.3	17.7	549,532	37.4	0.38	0.771
Zacatecas	1,413.1	54.4	45.6	1,837	0.2	0.30	0.754

SOURCE: Produced with data from Presidencia de la República. *Tercer Informe de Gobierno. 1 de septiembre de 2003. Anexo.* México; www.conapo.gob.mx (National Population Council's web page).

NOTES:

e/ National Population Council (CONAPO) estimates.

1/ Population ages five and over who speak an indigenous language.

2/ Percentage over total population ages five and over in each state.

3/ Marginality index estimated by CONAPO. Variables and indicators considered include general income levels, housing and infrastructure, public services—electricity, drainage, drinking water—access to health and education services, among others.

4/ Human Development Index (PNUD-UNESCO), estimated by CONAPO. Among the variables used for its estimation: life expectancy and life expectancy at birth, literacy indexes, percentage of population ages 4 to 24 who attend school, per capita GIP, etc. It runs from zero to one. All states in Mexico scored high and medium high in their human development year 2000 index values.

Table 6. Percentage of Children Who Complete Primary, Lower and Upper Secondary Education¹

STATES	ENTERED PRIMARY 1992-1993	FINISHED PRIMARY 1997-1998	FINISHED LOWER SECONDARY 2000- 2001	EXPECTED TO FINISH UPPER SECONDARY 2003-2004 ^e
	Total	%	%	%
National	2,482,621	84.9	57.3	33.6
Aguascalientes	22,230	94.1	66.1	37.5
Baja California	47,643	94.2	63.0	37.3
Baja California Sur	8,617	96.4	73.1	49.0
Campeche	18,118	83.2	53.4	33.8
Coahuila	51,796	90.9	69.0	38.9
Colima	11,944	90.9	63.5	38.0
Chiapas	130,766	63.1	36.6	24.9
Chihuahua	74,288	79.3	48.1	31.0
Distrito Federál	166,210	99.0	75.9	52.6
Durango	40,510	85.1	51.4	29.3
Guanajuato	135,952	83.3	50.6	24.2
Guerrero	109,248	66.9	38.5	22.5
Hidalgo	54,810	97.6	73.1	34.0
Jalisco	172,991	83.5	50.3	31.2
Estado de México	294,258	93.0	64.4	30.8
Michoacán	118,989	80.3	43.6	25.2
Morelos	35,523	95.8	72.6	40.3
Nayarit	25,466	85.1	64.0	36.8
Nuevo León	76,277	93.5	75.0	43.8
Oaxaca	109,113	76.2	49.6	25.1
Puebla	137,103	83.1	54.6	36.5
Querétaro	35,135	94.3	56.8	30.7
Quintana Roo	16,612	97.4	72.4	42.5
San Luis Potosí	61,760	90.8	64.9	33.4
Sinaloa	65,145	85.4	61.7	40.5
Sonora	51,715	87.5	64.0	40.2
Tabasco	51,486	87.5	64.7	48.6
Tamaulipas	58,358	90.5	68.5	47.1
Tlaxcala	23,627	96.7	70.4	41.4
Veracruz	197,603	75.3	51.2	31.7
Yucatán	44,701	76.8	56.2	31.2
Zacatecas	34,627	91.9	51.3	25.4

SOURCE: Produced with data from SEP, DGPPyP.

NOTES:

1/ This information is not completely accurate since no precise cohort analysis is possible with existing statistics. The percentages are an approximation of cohort completion rates.

Table 7. Equity and Outcome Indicators (2000 to 2003)^e

STATES	GLOBAL COVER-AGE ¹ 2003-04 ^e %	AVERAGE SCHOOLING RATES ² 2000 (school grades)			ILLITERACY RATES ³ 2003 %			EDUCATION LAG ⁴ 2000 %		
		TOTAL	Male	Female	TOTAL	Male	Female	TOTAL	Male	Female
National	69.4	7.3	7.6	7.1	9.5	7.5	11.4	53.1	50.9	55.0
Aguascalientes	71.4	7.9	8.1	7.8	4.9	4.3	5.4	50.2	48.3	51.9
Baja California	63.5	7.9	8.1	7.8	3.7	3.2	4.2	44.9	44.2	45.6
Baja California Sur	75.6	8.2	8.2	8.2	4.3	4.0	4.6	45.2	45.2	45.2
Campeche	71.2	6.9	7.2	6.6	11.9	9.6	14	58.2	55.7	60.6
Coahuila	71.5	8.2	8.4	8.0	4.0	3.7	4.2	45.2	43.4	47.1
Colima	71.1	7.6	7.7	7.5	7.3	7.0	7.4	51.6	51.2	51.9
Chiapas	71.3	5.3	5.8	4.8	23	16.8	29	71.5	68.3	74.5
Chihuahua	64.4	7.5	7.5	7.5	4.9	4.8	5.0	54.5	54.1	54.9
Distrito Federal	84.9	9.4	9.9	9.1	3.0	1.8	4.1	33.7	30.1	36.8
Durango	69.2	7.2	7.2	7.2	5.5	5.4	5.6	57.7	57.4	57.9
Guanajuato	68.5	6.3	6.5	6.1	12.1	9.9	14.0	64.0	61.7	65.9
Guerrero	68.8	6.0	6.4	5.7	21.6	17.6	25.2	64.0	61.8	66.0
Hidalgo	73.1	6.6	6.8	6.4	15.0	11.7	17.9	59.0	57.1	60.7
Jalisco	67.6	7.4	7.6	7.2	6.5	6.0	7.0	54.2	52.6	55.7
Estado de México	62.7	7.9	8.3	7.6	6.5	4.1	8.6	45.6	42.3	48.7
Michoacán	65.0	6.1	6.3	6.0	14.0	12.8	15.1	65.4	64.2	66.4
Morelos	69.4	7.6	7.8	7.4	9.3	7.5	10.9	47.6	46.2	48.8
Nayarit	71.0	7.2	7.1	7.3	9.1	9.0	9.2	53.3	54.3	52.4
Nuevo León	70.9	8.5	8.8	8.3	3.4	3.0	3.9	38.3	35.6	41.0
Oaxaca	70.6	5.6	6.0	5.2	21.6	15.6	26.8	70.1	67.6	72.4
Puebla	68.2	6.6	7.0	6.3	14.7	10.7	18.2	60.6	58.1	62.8
Querétaro	69.4	7.5	7.8	7.1	9.9	7.1	12.3	51.2	48.0	54.2
Quintana Roo	65.7	7.6	7.9	7.3	7.6	5.8	9.5	47.9	44.9	51.1
San Luis Potosí	70.0	6.8	7.0	6.7	11.4	9.6	13.0	58.5	57.5	59.5
Sinaloa	71.4	7.6	7.6	7.6	8.0	8.3	7.8	53.2	53.5	53.0
Sonora	72.2	8.1	8.1	8.0	4.5	4.5	4.5	46.6	46.9	46.2
Tabasco	73.9	7.1	7.4	6.8	9.8	7.3	12.1	56.6	53.6	59.4
Tamaulipas	69.4	7.8	8.0	7.7	5.2	4.6	5.8	48.4	46.8	49.9
Tlaxcala	69.2	7.6	7.9	7.3	7.9	5.5	10.0	50.7	47.9	53.3
Veracruz	68.4	6.4	6.6	6.1	14.9	11.7	17.8	62.5	60.6	64.2
Yucatán	71.6	6.8	7.1	6.5	12.4	10.1	14.6	58.9	56.3	61.3
Zacatecas	66.2	6.4	6.4	6.4	8.0	7.6	8.5	66.1	65.7	66.4

SOURCE: Produced from data from SEP, DGPPyP; National Population Council (CONAPO) and the Presidency, from Presidencia de la República, *Tercer Informe de Gobierno. 1 de Septiembre de 2003. Anexo, México.*

NOTES:

e/ Estimated data.

1/ Global coverage is equal to total enrollment—including tertiary education and job training—by population ages four to 24 (middle of the year population estimate).

2/ Average number of school grades attended and concluded by population, ages 15 and over.

3/ Percentage of people, 15 years and older, who answer, when asked, that they cannot read and write. Estimation by CONAPO from Census data.

4/ Percentage of population 15 years old and over which has never gone to school or has failed to complete basic education (including lower secondary).

Table 8. National Education Expenditure by Type and Level, 2003

	Annual per student spending (US dollars)
National	1,340
<i>Public</i>	1,236
Preschool	887
Primary	802
Lower Secondary	1,236
Profesional Técnico (Higher Secondary)	1,236
Bachillerato	1,783
Higher education	3,962

SOURCE: Estimated with data from SEP, *op.cit.*

Note: US \$1 = 10.6 pesos.

Table 9. National Education Expenditure, 2003

	US BILLION DOLLARS
NATIONAL	42.4
Public	34.2
<i>Federal</i>	27.9
<i>State</i>	6.2
<i>Municipal</i>	0.1
Private	8.3
PUBLIC EXPENDITURE BY EDUCATION TYPE (Federal)	
Basic	18.0
Upper secondary (Media superior)	2.6
Higher	5.3
Others	1.9

SOURCE: SEP, *Tercer Informe de Labores 2003*. Annex.

NOTE: US \$1 = 10.6 pesos

APPENDIX B

REVIEW OF RECENT RESEARCH ON MEXICAN EDUCATION

Prepared by Paula Razquin

Introduction

This appendix examines the recent literature on education in Mexico. The review is not meant to be comprehensive; it is designed to facilitate a discussion of the main policy issues faced by the Mexican education system today. In addition, it identifies gaps in the research literature on education that can suggest areas for future development.

For this review, we consulted journal articles, books, and research or policy reports from international organizations and the Mexican government, both available in the United States and Mexico. Several criteria were considered when selecting studies for the review. First, we focused on recent research, selecting only documents published in the past five years. References published previous to 1999 have been excluded. Second, we focused on empirical research, although in some instances we included relevant policy documents that provide summaries of important areas of policy concern. Studies that were only historical, theoretical, pedagogical, or targeted U.S. schools that educate immigrant Mexican were not considered. All studies reviewed here are listed in the reference section of this documented briefing. Note that we identified many more sources than those reviewed here. We chose to focus on pieces that were more rigorous. This selection excluded many papers from this review.

Current Research in Mexico

Before summarizing critical policy issues as suggested by research evidence and policy documents, it is worth discussing briefly how the entries reviewed fit into the larger picture. The period covered in the literature review (last five years) captures only the tip of the iceberg of research on Mexican education. Educational research in Mexico can be traced as far back as 1936 when the *Instituto Nacional de Pedagogía* (National Pedagogical Institute) opened its doors. Since then, but particularly after the 1970s, the field has expanded considerably as the numbers of research institutions and scholars increased, and the topics and theoretical approaches grew more diverse (Weiss, 2003).

Pedagogy and educational psychology were favorite fields in the 1950s and 1960s. Research in math education and history of education grew considerably after the mid-1970s and spurred one of the strongest academic communities in the country. Mexico also has a strong ethnographic research tradition in a variety of topics (e.g., teacher training and teaching practices). The now six-decade long research tradition in Mexico has taken new directions in the mid-1990s to include major fields such as: education and society; education coverage and quality; teacher training; teaching and learning processes;

nonformula, adult, and popular education; curriculum development; institutional and organizational studies; evaluation; education policies; education planning and management; communication and culture; epistemology; and education technology. The math education field continues to expand; while fields related to decisionmaking (like evaluation and education planning and management) had a weaker development than it had been expected in the 1980s (Weiss, 1999).

The literature we reviewed can be classified along four broad levels based on the focus of research: student coverage, attainment, and achievement; teachers and teaching; education systems; and education and the economy. Student coverage and attainment is the issue that has been studied the most in recent years. This might be a result of changes in education policy in the 1990s. Schmelkes and López (2003) argue that, in the 1990s, although general education goals continue to be the same as before, the priority changed. In 1990, improving education quality was the most important priority, while in 1996 the priority shifted to issues of coverage.

Table 10. Frequency of issues covered by empirical research.

Level Issue	Frequency of issue
<u>Student coverage, attainment and achievement</u>	23
Coverage and education attainment	15
Achievement	8
<u>Teachers</u>	18
Salaries and supply	4
Teaching practices	9
Training	5
<u>Education system: federal and state level</u>	13
Curriculum	1
Education policy	1
Education finance	7
Supply	2
Assessment & information systems	2
<u>Education and the economy</u>	3
Total	56

Each section below offers a description of the issue at stake (from Table 1), highlights the factors that determine the issue being described (when available), identifies areas of controversy, assesses the overall merit of the sources examined, and discusses their policy implications.

Student Coverage, Attainment and Achievement

Coverage and education attainment

There is evidence to suggest that mean levels of schooling of the Mexican population increased drastically between 1970 and 2000 (Martínez Rizo, 2002). While in 1970, the population of more than 15 years old had an average of 3.4 years of schooling, in 2000 the mean increased to 7.5. Although these statistics are optimistic about Mexico's educational progress, they hide the fact that, in 2000, there were still almost 6.5 million Mexicans with no formal schooling.

Average statistics also hide the fact that there are large inequalities within Mexico in terms of education. States like Chiapas, Oaxaca, and Guerrero have been ranking at the bottom of the years of schooling distribution since the 1970s, and had an average of six or fewer years of schooling in 2000. On the other hand, states like Mexico City and Nuevo León, remain at the top of the distribution, with about nine years or more of schooling in 2000. This suggests that states at the bottom of the educational attainment ranking of years of schooling are about 30 years behind those at the top.

The literature we researched seems to have come to the conclusion that coverage is no longer a problem in primary education, but remains one in preschool, lower, and upper secondary education (Velez Bustillo, 2001). Edwards and Liang's (1998) study of Mexico's preschools compared preschool enrollments with population of age five and show that preschool coverage was of about 50 percent in 1995. Today, it is around 56 percent. In lower secondary schools, coverage has greatly increased to current levels of 86 percent, but more than a decade after this level became compulsory, it is far from universal.

Researchers from the World Bank office in Mexico, the Mexican Secretary for Social Development, CIDE, and Brown University in the United States have been able to use available data and logistic models to provide explanations for more specific education outcomes, such as preschool enrollment and first grade repetition (Edwards and Liang, 1998), school enrollments (Muñiz M., 2001), school attendance and lagging behind in school (Parker and Pederzini, 2000a, 2000b), sixth grade completion and drop out for those who completed primary (Giorguli Saucedo, 2002), enrollment in secondary and upper secondary (López Acevedo, 2004; López Acevedo and Salinas, 2000), and adolescents' education attainment (Mayer-Foulkes, 2003). All of these studies provide information at the national level and in a few cases are able to disaggregate the data by state, urban or rural area, or wealth status.

In all the studies reviewed, the empirical evidence suggests that students' socioeconomic background is the most important determinant of most of the outcomes of interest.⁴⁷

- In Oaxaca, Guerrero, Hidalgo, and Chiapas, children in poor households, or have parents with low education were less likely than other children to be enrolled in

⁴⁷ In her study of the community effects on desired schooling, Binder (1999) also found that socioeconomic variables such as household spending and being a homeowner have a significant influence on desired schooling.

preschool (Edwards and Liang, 1998). This study used household survey (*Encuesta Nacional de Ingresos y Gastos de los Hogares- ENIGH*) data for 1994.

- Children aged six to 16, from extreme poverty households, who are working, with less educated parents, were less likely than other children to be enrolled in school (Muñiz M., 2001). This study uses Conteo data for 1995.
- Children aged 12 through 15 in households with dirt floors were more likely to lag behind in school (Parker and Pederzini, 2000). This study used Conteo data from 1995.
- Children between 13 and 16 years old and with less educated head of households were less likely than other children to complete sixth grade (Giorguli Saucedo, 2002). This study used ENADID data for 1992.
- Adolescents between 17 and 19 years old that are shorter (a proxy used for child nutrition), in lower socioeconomic status households were less likely than other adolescents to complete a further three-year period of study after finishing primary (Myers and de San Jorge, 1999). This study used ENSA 2000 data.

With respect to how educational investments influence student outcomes, we summarize some findings from major studies in this area:

- With the exception of household income, monetary transfers from the federal to the state governments (per child) have a higher effect on enrollment in secondary or upper secondary schools than socioeconomic characteristics (López Acevedo, 2004; López Acevedo and Salinas, 2000) These studies combined household survey (ENIGH) data for 1996 with education expenditures data from SEP.
- Increasing the supply of lower secondary schools per capita had a large impact (an average of 500 percent) on the probability of school attendance for children aged 12 through 15, but only on rural areas (Parker and Pederzini, 2000). This study used Conteo data for 1995.

There have been some programs specifically designed to increase educational attainment of low-income students like PARE (program to eradicate educational disadvantages) and PROGRESA. PARE was designed to assist the four states with the highest incidence of poverty and low education indicators (Oaxaca, Guerrero, Chiapas, and Hidalgo) in improving the quality and efficiency of primary education. It was launched in 1992, and it provided students with school materials, and gave districts resources to improve school infrastructure, reduce teacher absenteeism, and improve the quality of education. PARE was evaluated by researchers from the World Bank and CINVESTAV (see, for example, Ezpeleta and Weiss, 1994 and 1996). PROGRESA was designed to improve educational attainment by providing cash scholarships to families in extreme poverty. Its innovative design linked education with health services and nutrition. Parents receiving PROGRESA grants, were expected to commit their children to regular school attendance, participation in preventive health services and education, and increased nutrition. PROGRESA was implemented as a randomized experiment and evaluated by The International Food Policy Research Institute (IFPRI) and Yale University (Skoufias, 2001;

Parker and Teula, 2003; Schultz, 2000 and 2001). Overall, researchers have found positive benefits associated with both PARE and PROGRESA with respect to educational attainment:

- Participating in the PARE program increases the probability that students will continue in school by the sixth grade (López Acevedo, 1999). For rural students, the probability of school desertion is 20 percentage points lower for students in the program than in the control group. However, the results do not hold for indigenous students and López Acevedo argues that high-achieving native students move to rural schools, where they are immersed in a Spanish-speaking environment.
- Primary enrollments increase for children participating in PROGRESA by 1 percentage point, while secondary enrollments increase by 6.5 percentage points (Schultz, 2001).

The findings from the coverage and education attainment research suggest the following policy issues: (a) Attention should be put on all levels, but preschool and secondary education coverage needs more improvements than primary coverage. Attention on primary education coverage should target poor areas only; (b) More disaggregated data are needed. Data at the state and municipal level would allow state policymakers to target their investments to the disadvantaged areas;⁴⁸ (c) If the goal is to achieve universal coverage in secondary education, the federal government could consider increasing federal transfers to the states, particularly to those with more population in rural and poor areas. However, the effect of federal transfers seems to be moderate, so the increase would have to be high; (d) Increase child nutrition and health could have long-term effects at overcoming the barriers to higher secondary and tertiary education.

Student Achievement

In the past, issues of educational quality were assessed using basic attainment indicators: the proportion of students in the school age that are enrolled in schools and the proportion that completed and graduate from each level. Since the mid-1990s, Mexico has been implementing national and international achievement tests that yield more precise quality measures than the basic indicators. In 1998, the *Prueba Estándares*, a criterion-referenced national achievement test implemented by the SEP, replaced previous testing operations that were in place between 1994 and 2000.⁴⁹ The *Prueba Estándares* tests a nationally representative sample of students in second to sixth grades in primary and first to third grades in lower secondary, in math and reading.

Descriptive evidence shows that student achievement in Mexico is low, both by its own standards and relative to other countries (México, INEE-Instituto Nacional para la Evaluación de la Educación, 2003). Results from the 2002–03 *Prueba Estándares* for sixth grade in primary indicate that about 45 and 15 percent of sixth graders in urban schools

⁴⁸ Edwards and Liang (1998), for example, suggested that a few changes in the ENIGH and SEP data would add more information on coverage and equity at no additional costs.

⁴⁹ For example, the Primary Education Assessment Survey (EVEP, *Evaluación de la Educación Primaria*).

have achieved satisfactory or above satisfactory competency in reading and math respectively. In general lower secondary schools, the percentages of those who reach satisfactory scores are about 76 and 50 percent for reading and math respectively. Mean achievement scores, however, obscure important sector and regional disparities. Achievement levels are lower for students in public than in private schools, and lower for children in rural and indigenous areas than in urban ones (Martínez Rizo, 2002).

Not only do Mexican students perform below desirable levels on national tests, they also rank lower than students on international examinations (INEE, 2003). Results from the 1995 TIMSS⁵⁰ tests, for example, show that Mexican primary school students in third and fourth grade scored, on average, about 20 percentage points lower in math and science than students in other countries. In secondary schools (first and second grades), Mexican students scored about 18 percentage points less, on average, than other countries, while in Science they scored about 13 percentage points less than students in other countries such as the United States, Singapore, South Korea, Colombia, South Africa, and Iran. In the PISA-2000 tests⁵¹ that test students in OECD countries, Mexican students rank 34 in reading competencies only above Chile, Brazil, Macedonia, Indonesia, Albania, and Peru. The scores are based on the average of the percentage of 15-year-old students in secondary schools that are classified as good, regular, and bad readers.

Perhaps a better comparison group for Mexico are the countries in the Latin American region, closer in terms of socioeconomic indicators than OECD countries. Results from the 1997 *Laboratorio Latinoamericano* (LLECE) tests for third- and fourth-grade students showed Mexico below the regional mean on the average of all scores.⁵² While Mexican students tend to do better than the regional mean in operations with natural numbers, fractions, identifying the message in a text, and recognizing specific information in a text, they score significantly lower than the regional mean on reading issues such as distinguishing the messenger from the receptor in a text. Because only 13 Mexican states participated in the LLECE testing, the results may not be representative of the country as a whole.

In a recent document about the World Bank strategy for the education sector in Mexico, Velez (2001) suggests that deficiencies in teacher training, inadequate supervision, weak curriculum implementation, and excessive emphasis on memorization and rote learning are some of the reasons why Mexican students show low levels of learning achievement. Although we did not find any empirical evidence to support these claims, they are recurrent themes in discussions of education in Mexico and thus should warrant more rigorous research efforts in the future.

⁵⁰ Third International Math and Science Study, conducted by IEA, the International Association for the Evaluation of Educational Achievement.

⁵¹ PISA-2000, OECD Program for International Student Assessment.

⁵² The LLECE (*Laboratorio Latinoamericano de Evaluación de la Calidad Educativa*) tests are implemented by UNESCO and only 13 countries participated in the 1997 test administration.

Researchers in Mexico have not yet taken advantage of the wealth of information available through the *Prueba Estándares* to examine the factors that influence student achievement. However, there have been some studies that used longitudinal data to evaluate the impact of specific education interventions on student test scores. In particular, the evaluations of the PARE and PROGRESA program were able to identify positive effects on student test scores after the programs had been implemented for a couple of years.

- Using data from 1993, researchers found that children who have access to preschool, particularly private day care, show higher achievement levels before entering primary school than those who do not attend preschool (Edwards and Liang, 1998).
- The language spoken at home is also crucial for children in poor states such as those served by PARE. Speaking Spanish at home has the strongest effect on the combined math and Spanish achievement of kids in fifth grade. Regardless of teachers' efforts and other student and school characteristics, children who speak Spanish score much higher than those who do not, after controlling for their fourth-grade achievement.
- Using propensity score matching, Shapiro and Moreno Trevino (2004) found that students in schools receiving PARE support did improve their achievement scores on the *Prueba Estándares* exams.
- The PARE program had a large positive impact on Spanish achievement scores of students from fourth to sixth grades. At its maximum effect (when implemented as designed and all the supply components of the program are present), PARE increases student performance by 50 percentage points. The impact has been larger for indigenous students, increasing performance from 45 to 90 percent. (López Acevedo, 1999 and 2003)

Although these studies certainly contribute to our understanding of student achievement of primary school children in the states served by the PARE program, their results should be taken with caution, as many of these papers do not describe their methodologies in full detail, making the results difficult to interpret.

Other studies that have tried to take advantage of existing longitudinal data sets in Mexico to analyze the impact of various educational inputs on student achievement have found the following:

- Using 1997 results from the former Primary Education Assessment Survey, an achievement test that has been discontinued and replaced by *Prueba Estándares*, López Acevedo (2002) examined how teachers' effort, their work characteristics, and school factors affect student achievement. Results show that teacher pedagogical efforts, interaction with students, and even school supervision have positive effects on student achievement (López Acevedo, 2002). However, their contract characteristics, particularly whether or not they have short-term contracts,

seem to be detrimental to student achievement. Her study also shows that teacher enrollment in *Carrera Magisterial* has benefited student achievement.

- Using the *Carrera Magisterial* to study teacher quality and student achievement in Mexico City, Santibañez (2004) found that students that were taught by teachers with higher scores in the teacher test were associated with higher student achievement. In particular, elementary teachers who scored higher on the subject-matter knowledge of the teacher test, and secondary teachers who scored higher on the teaching methodologies section of the test, were associated with higher student achievement gains. This suggests that the *Carrera Magisterial* tests could indeed serve as tools to identify and reward better teachers.
- However, a recent paper by McEwan and Santibañez (2004) found that design and implementation flaws in the program result in teachers having little incentive to improve student achievement.

There are some key policy issues that emerge from the literature on student achievement: (a) Evidence shows that student achievement in Mexico is low, particularly for students in rural and indigenous areas. Improving achievement levels for these students is fundamental, and interventions such as PARE seem to have been successful, although greater attention needs to be paid to the poorest of these disadvantage kids. National incentives program such as *Carrera Magisterial* appear to provide little incentive for teachers to improve achievement. However, more evaluations of these and other programs are needed to improve them. (b) State differences in student achievement are also striking. State-, municipal-, and even school-level data could allow state policymakers to identify areas to target their investments more effectively than across-the-board interventions (Martínez Rizo, 2002). Future analyses of the *Prueba Estándares* results deserve more disaggregated information than the one currently produced.

Teachers and Teaching

One of the most often cited reasons for the low quality of education in Mexico has to do with teachers. One paper concluded that: teacher training and teacher allocation in schools is deficient; teacher absenteeism is a problem in rural and urban marginal areas, teachers spend a large amount of time on tasks with little pedagogical value; and teachers receive little or no feedback on their teaching techniques due to weak supervision (Velez Bustillo, 2001). However, studies focusing on teacher efficiency or teacher supply are few and far between.

The relatively small number of studies about Mexican teachers seem to focus around teacher salaries, teacher training, and teaching practices. On the salary front, researchers have found that, overall, teachers appear to earn salaries that are above salaries in other occupations requiring similar levels of education (López Acevedo, 2002; López Acevedo and Salinas, 2001; Santibañez, 2002). They also found that:

- Teachers also work fewer hours and face a lower risk of uncertainties of having their living standards reduced during their career, given that their salary is highly regulated and their salary profiles are quite flat along their teaching career.
- However, the teacher salary premium is positive only for female teachers and not for male teachers, indicating that teaching might remain more attractive for women than for men.
- Public sector employment seems to be more convenient for teachers than private sector employment, in part because the teachers' union has been able to defend their salaries.
- There is some evidence to suggest that teachers may be responding to the salary premium that the occupation offers, as is observed in the increase in enrollments in teacher training institutes. We would need to match enrollment data on teacher training with more historical information on the salary premium to examine how responsive teachers are to their salary conditions.

On the topic of teacher training and teaching practices, ethnographic studies have generally found that teacher training does not assure that teachers develop sufficient content competencies, and that school management styles or working conditions are not conducive to implementing active learning strategies in the classroom (Carvajal Juárez, 2001; Díaz Pontones, 2001; Jiménez Lozano, 2003; Mercado, 2000; Miller, 2001; Rojas-Drummond, Mercer, and Dabrowski, 2001; Smith, Jimenez, and Martinez-Leon, 2003; Ríos Morales and Caballero, 2002). Other studies have found the following:

- In 1991, an informal evaluation of the 335 existing public teaching colleges in Mexico concluded that academic quality levels at the public teacher colleges or *Normales* were very poor, mostly due to faculty that focused solely on teaching and not on research, and low levels of support and resources for tutoring, academic exchange, curriculum development, and evaluation (Tatto and Velez, 1999).
- Before the 1984 teacher college reforms, only 10 percent of semester-hours at teacher colleges were dedicated to learning about the subject teachers were being trained to teach (Tatto and Velez, 1999). Even though teacher education now offers more subject-matter courses, the priority remains on teaching teachers how to teach.
- A large proportion of secondary school teachers (40 percent on average, but as high as 60 percent in places like Mexico City) have not received any pre-service teacher education. In addition, a large proportion of secondary teachers (although it is not exactly known how large) teach out-of-field (Santibañez, 2004).
- Continuous professional development (CPD) consists mainly of national courses, state-level courses (which have to be centrally approved), general training workshops (designed centrally), and brief workshops conducted in the Teacher Centers. CPD in Mexico follows a one-size-fits-all approach (all teachers regardless of whether they teach in an urban area or a rural area, an academic or a distance secondary school, or have 2 years or 20 years of experience) receive the same training (Santibañez, 2004).

Education System: Federal and State Level

Curriculum

Despite a drastic curriculum reform implemented in 1992, some researchers contend that the Mexican basic education curriculum remains problematic. Active learning strategies have not been introduced in the curriculum and, moreover, the curriculum does not incorporate multicultural approaches necessary to work with indigenous groups (Velez Bustillo, 2001). These issues may be key for education change, but they are not backed by empirical evidence, at least the type of evidence needed to support policy implementation and investment.⁵³ More case studies of the effects of curriculum normative changes are needed to understand the cultural, micro political, and even pedagogical constraints to a change in teacher practices.

At the lower secondary level, some researchers have raised the issue of fragmentation of the curriculum, arguing that a curricular structure of 11–12 subjects per grade means teachers must teach more classes per week (Quiroz, 1998). Quiroz (1998) also argues that a secondary school curriculum with these many subjects causes students' time to be overly fragmented. Although these arguments are often echoed by policy makers and researchers in Mexico, they do not seem supported by either empirical data, or other countries' experiences. Countries with developed education systems such as Germany, France and the United States teach multiple subjects in middle school, and this does not appear to be the major cause behind student dropouts or poor achievement. Furthermore, the problem of teachers teaching multiple classes, seems to have more to do with how teachers' time is organized (e.g., double-shifting, contracts that are spread out across schools) than with the structure of the curriculum. Quiroz (1998) also argues that one problem with the current secondary school curriculum has to do with its inflexibility. Students must all take the same subjects for three years, and there are few optional courses. While flexibility can be regarded as a positive attribute in most cases, the author does not present any empirical evidence to link this uniformity to student or other outcomes.

⁵³ There is only one case study of the implementation of recent changes in the secondary education curriculum that can be taken as an example of the limitations that changes in the curriculum face when implemented in the classroom. A study done by a researcher from the *Universidad de Morelos* examined the inclusion of the subject Civic Life and Ethics (*Formación Cívica y Ética*) in the 1999 curriculum and provides evidence, though limited in its scope due to its ethnographic nature, that active learning is still far from being everyday practice (Yurén and Araújo-Olivera, 2003). Findings show that the curriculum does promote a participatory distribution and consumption of knowledge and the significance, relevance, and transferability of the contents to be taught. However, the author suggests that just including active learning in the curriculum is not enough, and that attention should be paid on teacher identity issues as well. Teachers tend to resist changes that imply shifts in their position of power within the classroom and accommodate their practices in ways that allow for the incorporation of new contents without really impacting the traditional culture of instruction.

Education policy

As previously discussed, the field of education planning and evaluation is still developing in Mexico. School evaluations are quite recent and they tend to be mostly descriptive or ethnographic. These qualitative school evaluations provide interesting descriptions of how policies or programs affect social behaviors in schools, and how education fits into peoples' daily lives and visions for the future. They also shed light on teaching practices in the classroom, on school operations, or on community participation in education. However, because they use nonrandom sampling techniques and small sample sizes (which is the case with most in-depth ethnographies and qualitative studies), their findings cannot be generalized to larger populations (see for example Ezpeleta and Weiss, 1994, for a qualitative evaluation of PARE).

Experimental or quasi-experimental research designs, those that include treatment, controls, and randomization, are almost nonexistent in Mexico, except for the case of the IFPRI evaluations of PROGRESA. In the past five years, there has been some impact-evaluation type work for projects such as PARE,⁵⁴ *Carrera Magisterial*,⁵⁵ PROGRESA,⁵⁶ and CONALEP.⁵⁷ It should be noted, that except in the case of CONALEP and *Carrera Magisterial*, these kinds of evaluation were possible because data was collected since the programs were first implemented.

Beyond these, there are few studies that look at the impact of educational policy. In the early 1990s and after the 1992 National Agreement to Modernize Basic Education and the decentralization reform that was part of that agreement, Mexico has produced some policy research, focusing on historical, financial, institutional, political dimensions, and state-level implementation of the decentralization reform (Zorrilla Fierro and Villa Lever 2003).⁵⁸ Research on education in Mexico seems to need more attention to the macro organizational and policy context, policy implementation, and actors, to help shape

⁵⁴ With most work done by researchers from the World Bank office in Mexico (López Acevedo 1999, 2003).

⁵⁵ Evaluated by researchers from the World Bank office in Mexico and U.S.-based researchers (López Acevedo, 1999, 2003; Santibañez, 2004; McEwan and Santibañez, 2004).

⁵⁶ With studies conducted mostly by the International Food Policy Research Institute (Adato, Coady, and Ruel 2000; Behrman, Sengupta, and Todd, 2000, 2001; Coady, 2000; Schultz, 2000a, 2000b, 2001; Skoufias, 2000; Skoufias and McClafferty, 2001; Skoufias, 2001).

⁵⁷ With work done by researchers from the World Bank office in Mexico (López Acevedo, 2001) and from Stanford University (Carnoy, 2000).

⁵⁸ The only study we found of this type published in the late 1990s is done by Veloz Avila (2003) from *Universidad Nacional Autónoma de México*, who studied the implementation of the decentralization reform in the state of Tlaxcala. In this study, the author examines the politics behind the changes in the institutional structure of the education administration after the transfer of education services to the state. She argues that the apparent lack of changes in the state education administration is not a result of mere motionless but of the administration's difficulties in dealing with the state branch of the national teachers' union. The teachers' union had enough influence in the state education bureaucracy and in the local political system to resist giving the previous federal bureaucracy the control of the state education system. The result of education politics in Tlaxcala has been a lack of real change in the state institutional framework to manage the decentralization process and transfer of decisionmaking to the local level.

education change and practice; in other words, of the institutional factors that affect policy making and implementation.

Education Finance

Depending on the data and the measures used, researchers have arrived at different conclusions regarding the evolution of educational finances in Mexico in recent years. Overall, it is believed that federal education expenditures are unequally distributed across states and income groups. Some states (i.e., Baja California and Mexico City) receive per-capita federal expenditures that are well above the country mean, while others receive per capita federal expenditures that are below the mean (i.e., Puebla, Guanajuato, and Chiapas) (Latapí Sarre and Ulloa Herrero, 2000). Studies on educational finance have also found the following:

- The state resource allocation pattern of federal expenditures is not associated with the distribution of the state's general or school-age population, or their own financial efforts but is indeed associated with their basic education enrollments and the state's contribution to the GDP and federal revenues (Latapí Sarre and Ulloa Herrero, 2000). In other words, states with more students enrolled and those who contribute more to the country's GDP and federal revenues receive more federal monies per capita than those that have fewer student enrollments and contribute less. The inequalities across states are found because those states that are the most needed (for example, student enrollment rates are lower than those for other states yet have to serve a bigger school-age population) receive a smaller share of the per capita federal expenditures than other states.
- The poorest income groups get most of the national and state education subsidies for primary education, but they get progressively smaller subsidies for higher levels of education. The education expenditures distribution is neutral in upper secondary, but regressive in higher education, benefiting upper-income groups (López Acevedo and Salinas, 2000).
- As with per-capita federal expenditures in education, there are state differences in the distribution of subsidies across income groups. In central Mexico, average total spending is uniformly distributed across income groups, in the northern states the subsidy is quite progressive, while in the central region upper secondary and higher education spending benefit the richest income groups. In Mexico City, however, the education subsidy is strongly regressive for all levels of schooling (López Acevedo and Salinas, 2000).

One study tried to understand the determinants of federal education expenditures and resource allocation in the country. It found that contrary to the view that education expenditure in Mexico is unequally distributed, Gershberg et al. (2001) claim that the federal government trades some efficiency for gains in equity, but in doing so treats states differently.⁵⁹ The authors conclude that, in 1990, the Mexican federal government

⁵⁹ They test two hypotheses. First, the extent to which the federal government attempts to trade efficiency for equity (which they call inequality aversion hypothesis). They do so by using data for 1980 and 1990 and an

displayed some inequality aversion nationally, meaning that it was willing to trade some efficiency for equity, particularly for higher percentages of post-primary educated population.⁶⁰ Moreover, they conclude that there exists an unequal concern in resource allocation, implying that the federal government allocates education expenditures based on other important states' characteristics not related to education outcomes, particularly their income levels and migratory population.⁶¹

The policy implications from the literature reviewed in this section are very macro and involve not only policymakers from the education sector but also from other sectors as well. The main policy implications stemming from this literature are as follows: (1) Develop policies for decentralization of education finance and deal with issues of resource allocation across states. Latapí Sarre and Ulloa Herrero (2000) and Gershberg and Schuermann (2001) agree that Mexico needs to develop education finance policies that go in accordance with the decentralized education structure. The first two authors believe that the country should promote more financial autonomy for the municipalities and suggest specific actions to achieve it (i.e., transfer operative and monitoring functions to the municipalities and modify budgeting and planning procedures to allow more participation from schools). On the other hand, the second two authors are more cautious and suggest that any decentralization strategy that allows states more discretion in the use of funds (i.e., matching grants) should evaluate the positive and negative effects on redistributing education outcomes and state incomes. To them, a centralized financing system may allow

education expenditures equation, and they look at the influence of two education outcomes (states' literacy rates for the school-aged population and the percentage of state population with at least some post-primary education) on expenditures. A significant coefficient for any of the two education outcomes tells the authors that the federal government is willing to trade off some efficiency for equity.

Secondly, they test the extent to which particular state characteristics influence the federal government resource allocation (which they call the unequal concern hypothesis). In this case, they use a similar model as for their first hypothesis, but include, in addition to the education outcomes, other factors such as the state median monthly income, proportion of the state's population that migrated to Mexico City, whether or not the state has a large indigenous population, and the percentage of vote cast for the PRI candidates for the state deputies to the national system. In this case, they look at whether two states with the same level of outcome receive similar or different levels of per-capita expenditures based on these other characteristics.

⁶⁰ Their findings show that, in 1990, literacy is not a significant outcome that the federal government targets with educational expenditures: In other words, the states' literacy rates are not significantly associated with federal education expenditures. The authors believe that the government is a utilitarian government and has efficient resource allocation as its primary objective or that, because all states achieved high levels of literacy in the school-aged population, it may not longer be necessary to target this outcome with education spending. However, federal education expenditures seem to be associated with their second education outcome measure: the percentage of the state's population with at least some post-primary education. In this case, the government is willing to trade off some efficiency for equity.

⁶¹ The unequal concern hypothesis (that the federal government's allocation of education resources is based on state characteristics other than the education outcomes of interest) is undoubtedly more dominant in the federal resource allocation pattern, particularly when literacy outcomes are included in the equation. Given two states with similar levels of literacy, the federal government seems to allocate more educational resources to relatively poor states and to those with fewer migration rates and indigenous populations. Conversely, given two states with similar percentages of post-primary education, the federal government allocates more education resources to those with fewer migrants. An interesting aside is that while in 1980 the government may have tried to reward PRI states, it does no longer seem to do so in 1990.

the federal government to redistribute resources among regions to compensate for other inequalities. (2) Consider alternative resource allocation mechanisms. In 1998, Mexico adopted a formula driven resource allocation mechanism where, for a given year, states receive from the federal government the same amount that they received the previous year plus budgetary increments based on the number of needed schools and teachers. Nevertheless, several other criteria have been suggested that seem to give more rationality to the distribution (Latapí Sarre and Ulloa Herrero, 2000; Paqueo, López-Acevedo, and Parandekar, 2003). (3) Develop policies to compensate for inequalities across income groups. The government should also adopt policies that redistribute public spending from upper income to lower income groups, particularly at the upper or secondary education levels. López Acevedo and Salinas (2000) suggest charging fees for wealthier families or provide subsidies for lower income ones in the form of secondary textbooks, scholarships, transport, and school materials.

Education Supply

There are a few studies that characterize the supply for education services. (Myers and de San Jorge, 1999) focused on low-income families in Mexico and suggest that there are not enough public early education centers. They found that about half of the very few children under three that were enrolled in childcare centers were in private centers. The authors conclude that preschool and early education coverage and quality should be improved for low-income communities such as the ones studied in Mexico City. This should include increasing the hours of attention to assist working families, and replacing unaccredited private centers with public centers, or have them accredited by an official body or institution.

Assessment and Information Systems

There has not been a lot of research focusing on assessment and information systems in Mexico. The few studies that we found concluded that the current assessment and information system in the country shows deficiencies on four key dimensions: the system itself, the quality of achievement tests, education statistics and indicators, and school assessments (INEE, 2003). With respect to the assessment system itself, Mexico has been implementing achievement tests for higher education students or prospective students since the 1960s and 1970s but testing of basic education students and teachers is a recent endeavor. Despite the improvements in the implementation of achievement tests in the last decade, testing operations still show technical deficiencies due to the lack of expertise. Moreover, results of achievement tests are hardly published, and their use as a diagnostic tool or for education research is limited (INEE, 2003).

Overall, the technical quality of national tests seems to be poor. *Prueba Estándares* tests are not aligned to national standards, in part because standards are not specific enough, but also because there was no coordination during the testing design and implementation between those responsible for curriculum development and those for testing. The tests themselves were not piloted and have technical flaws, and the current sampling

stratification (urban/rural areas) is insufficient for analytic purposes. Moreover, tests only include multiple-choice items and lack problem solving ones (INEE, 2003).

The problem with education statistics is one of use and quality of the indicators. Results are not used in a fashion that gives feedback to the system or guides policymaking. The production of education indicators does not respond to a coherent conceptual framework that guides diagnostic analyses, much less explanatory and predictive ones. The amount of information requested from school principals and teachers is such that data produced may lack precision and reliability. Finally, school assessments are quite recent and tend to be qualitative in nature.

The assessment field in Mexico seems to be open for research on technical aspects of testing (i.e., design, sampling, and alignment with standards), their use and impact, and the organizational, cultural, or political contexts in which they are embedded. The system also calls for macro and diagnostic studies that make sense of the vast amount of education indicators produced to contribute to policymaking.

Education and the Economy

There are only a handful of studies focusing on education and the economy. Using cross-sectional household and urban employment surveys for 1984, 1989, 1992, 1994, 1996, and 1998, Lopez Acevedo (2001) examines the contribution of education to earnings inequality. She also estimates the salary differentials for several levels of schooling; in other words, how much more or less people would earn had they more education. She found that:

- The inequality of overall distribution of income has increased. Despite a slight improvement between 1994 and 1996, by the mid-1990s, the poorest were poorer than a decade ago while the richest increased their income at expenses of the poorest and the middle classes.
- Education accounts for the largest share of earnings inequality in Mexico, both in gross (when the explanatory power of education is considered alone) and marginal terms (when the added effect of education when other predictors such as age, economic sector, and employment status are accounted for).
- Salary differentials for education increased in the period 1988-97 for all levels of education, but the increase has been steeper for those with upper secondary and university degrees.
- The expansion of average levels of schooling in the Mexican population has been insufficient to meet the increased demand for high-skilled labor due to the increased economic openness, and this has translated into higher rewards for those with higher levels of schooling to the disadvantage of less skilled workers. The consequence of this labor market and education dynamic has been an increase in earnings inequalities, despite the improvements in the distribution of education.

A World Bank (2000) report takes López Acevedo's results a step further and suggests that skills or knowledge acquired through technical education after completing the lower secondary level is a key factor in the determination of earnings. The report does not provide empirical evidence for such statement. However, with respect to technical education, an evaluation of recent reforms in the technical education system in Mexico compares labor market outcomes of the CONALEP technical education system to a control group of eligible students that did not participate in CONALEP (López Acevedo, 2001). The evaluation uses two sets of data, a CONALEP survey and employment surveys for 1998 and 1999. It does not calculate the actual rate of return of the investment in technical education, but it suggests that CONALEP is a highly cost-effective program.

- Technical education has positive labor market outcomes. The proportion of CONALEP students seeking employment is about 4 percentage points higher than in the control group.
- Job congruency is also higher. CONALEP students are more likely to work in the same economic sector as trained.
- CONALEP graduates earn about 17 and 22 percent more than their counterparts and are more likely to receive further training at work, apparently because they are more profitable.

The results of the CONALEP report are indicative of the economic benefits of technical education in Mexico. Yet the evaluation was an *ex post facto* evaluation and was no random assignment of students to the CONALEP and control groups. Moreover, it is unclear whether the control group was a real control group, similar to CONALEP students in other individual characteristics, but different only in the treatment received.

Insofar as education contributes to earnings inequality, López Acevedo (2001) suggests that education policies must continue to be at the core of any effort at reducing earnings inequalities in Mexico. She points to increased access to, and completion of, upper secondary and higher education. Most of the empirical research produced in the area of education and other systems has focused on the economic benefits of education. Issues such as the relationship between education and other social inequalities, poverty, political, or cultural outcomes have not been addressed in the education literature produced in the recent years.

APPENDIX C

LIST OF KEY CONTACTS

SEP Contacts

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Business Organizations and Individual Contacts

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Ing. Lorenzo Zambrano
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President of the Board of Trustees of the Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM)
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Ing. Alberto Bailleres
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Board of Trustees (and founding member) of the Instituto Tecnológico Autónomo de México (ITAM)
Mexico City

Ing. Carlos Noriega
Presidente del Grupo Noriega Editores
(Business representative on the board of several public education entities)
Mexico City

Foundations and Charities Involved in Education

SPONSOR	PROJECT	MISSION AND OBJECTIVES	MAIN ACTIVITIES
A group of private and public organizations	Unete	To achieve equal opportunities and to enhance the education level of Mexican society through new technologies	Provide schools with a media classroom (computers, software and teacher training)
Televisión Azteca (Mexican)	Fundación Azteca		Provide scholarships to 2,300 lower and higher secondary students enrolled at Azteca schools.
Fundación Televisa (Mexican)	Media classrooms School libraries	To provide computers and Internet for schools and fund school libraries	235 schools were equipped in 2003, 3525 computers were given out and 141,663 young people have access to computers. 129 schools and 13 libraries were equipped: 43,200 books for 60,000 children. 53 actors and actresses from Televisa conducted 129 reading sessions for students during 2003 33,781 children received glasses in various states. The entire needs of the state of Oaxaca were met.
Vamos Mexico (headed by the President's wife) (Mexican)	School buses as classrooms. Education Technology. School for Parents. Guides for Parents.	To equip buses to operate as mobile classrooms in places where there is limited access to school. To establish joint ventures with firms to bring computers and Internet to primary and secondary schools. To give advice to parents on how to better educate their children.	50 mobile units were handed over to authorities in 14 states. Potentially, this can benefit 3,000 students. In collaboration with WalMart, 600 computers were given to SEP for primary and secondary schools. The Mexican Institute for Educational Excellence received 2.3 million pesos for the development of radio programs. 15 million pesos were invested to develop: a written document for distribution among parents, a TV program, and a web page.
Ford Motor Co. (Mexican)	Ford Schools	To support the localities where they operate through job opportunities; to contribute actively to the welfare and development of their communities	Around 200 Ford Schools operate in Mexico. Program has been active for more than 37 years. More than 150,000 children currently attend primary schools sponsored and run by Ford. 1.5 million children have finished primary education in a Ford school in Mexico.
Mexico Unido Foundation (Mexican)	Lazos	To foster primary education among poor Mexican children through achieving three objectives: foster values education, improve quality, and reduce dropout rates.	Lazos godfathers children in need, through a Mx \$198 monthly contribution. It operates in 21 states. Almost 14,000 children are assisted. There are 123 Lazos sponsored schools, attended by more than 40,000 children.

<u>Centro Mexicano para la Filantropía</u>	Several projects	To promote philanthropy in Mexico and organized participation in social-oriented projects.	Various, mostly very small projects.
<u>Ford Foundation in Mexico City (U.S.)</u>	Grants to several institutions	To respond to the dramatic changes in the country, enhance the welfare of the poorest, and assist in consolidating democratic developments.	Some of the organizations which receive grants include: <i>Education and change:</i> workshops and action research to promote teachers' participation in educational debate, policy innovation and internal capacity building. <i>Social development and education:</i> Disseminate its community model for improving rural secondary schooling through enriched television-based education systems. <i>Fomento Cultural y Educativo, A.C.:</i> Increase Fomento's capacity building services in order to expand professional development opportunities for teachers' union leaders in Mexico City. <i>Citizens' Educational Observatory:</i> To strengthen dialogue on education between government and civil society through public opinion formation and public participation in educational affairs. <i>Mexico-North Research and Education Network:</i> To help the Tarahumara people of northern Mexico establish an intercultural educational program. <i>National Pedagogic University:</i> To launch an education program that integrates indigenous mathematics in primary school curriculum. <i>College of the Southern Border:</i> Core support for Casa de la Ciencia, an intercultural model of teacher training in marginalized indigenous regions of southeast Mexico.

Source: Web pages of every organization.

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