

Education in Mexico



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Introduction¹

Good education may be the single most powerful tool available to increase economic growth, enhance competitiveness and promote inclusion. Countries with higher levels of student learning grow more. Workers with higher levels of skills earn higher wages. Countries with large numbers of top performers, particularly in science and math, tend to compete more successfully in global trade. Countries that boost the human capital of the poor tend to reduce inequality. Well-educated individuals are more likely to participate in community affairs, and to favor democratic over non-democratic governance.

Education in Mexico generally fails to play these positive roles. Governments have invested heavily in expanding the public school system and today more children attend school than ever before. But few achieve the levels of learning necessary to promote prosperity, equity and democracy. Children from poor families are particularly unlikely to acquire the skills they need to get ahead. These shortcomings are a major obstacle to economic and social progress. Tapping education's potential to promote growth and inclusion will require making learning the chief objective of schools, and restructuring the education system to maximize it.

Mexico's standing in the World Economic Forum's most recent *Global Competitiveness Report* illustrates the problem. The country's overall competitiveness ranking has declined from 32nd in 1998 to 66 in 2010.² Although some part of this drop may be due to the inclusion of more countries in the annual rankings, Mexico appears to be losing ground.³

¹ The authors would like to thank Robert Myers, Carlos Ornelas, Sylvia Schmelkes, Anil Sood, and Mónica Tapia for their helpful and detailed comments on earlier drafts of this document. The contents of the final version, as well as any errors of fact or interpretation, are the sole responsibility of the authors.

² Schwab, K. 2010. *The Global Competitiveness Report 2010–2011*. Centre for Global Competitiveness and Performance. Geneva: World Economic Forum.

³ Based on Bloom, Erik. 2008. Closing the Gap in Mexico's Upper Secondary Education System. Unpublished Working Paper.

A look beyond the composite index suggests that deficiencies in education are an important part of the country's failure to improve (Table 3.1). Despite ranking relatively high in measures of enrollment, Mexico ranked low in measures of quality—120th out of 139 in overall quality of the education system, 120th in quality of primary education, and 128th in quality of math and science education. These rankings reflect the perceptions of Mexican business leaders; clearly they are worried about the low quality of education of Mexico's workforce.

Current circumstances

Enrollments have increased at all levels, and today nearly every child attends primary and lower secondary school. By most standards, Mexico has made substantial progress in getting children into school. It has largely achieved the United Nations Millennium Development Goals in education: universal primary completion, and gender parity in primary education.⁴ It has also made significant progress in meeting the six Education For All (EFA) goals established at the 2000 World Education Forum in Dakar.⁵ Approximately 7 of 10 children are enrolled in pre-school, 9 of 10 in primary, 9 of 10 in lower secondary and 6 of 10 in upper secondary. During the past 20 years, pre-school enrollment rates have

⁴ According to the United Nations Statistics Division, indicators for Mexico that measure progress towards reaching the MDGs are: Net enrolment ratio in primary education (percent both sexes): 99.4 ; Percentage of pupils starting Grade 1 and reach Grade 5 (percent both sexes): 92.1 ; Gender parity Index in primary level enrolment (ratio of girls to boys): 1.0 ; Literacy rates of 15–24 years old (percent both sexes): 98.1.

⁵ The six Dakar goals, also called Education for All (EFA) goals, were set in 2000 in Dakar, Senegal. They were adopted by the international community and are focused on accelerating education progress by 2015. The six goals are: 1) expand and improve comprehensive early childhood care and education, 2) ensure universal primary education, 3) ensure youth and adult learning needs through equitable access and to appropriate learning and life skills, 4) achieve a 50 percent improvement in levels of adult literacy, 5) eliminate gender disparities in primary and secondary education by 2005, and achieve gender equality in education by 2015, 6) improve all aspects of the quality of education. According to the 2011 *Education for All, Global Monitoring Report 2011*, Mexico has either reached its goals or at least made substantial progress toward them.

Table 3.1 Global Competitiveness Index, 2010–2011, Mexico, selected education indicators

Selected education indicators	Rank (out of 139)
Primary education enrollment rate	29
Quality of the educational system	120
Quality of primary education	120
Quality of math and science education	128
Overall ranking	66

Source: Schwab, K. 2010. *The Global Competitiveness Report 2010–2011*. Centre for Global Competitiveness and Performance. Geneva: World Economic Forum: 238–239.

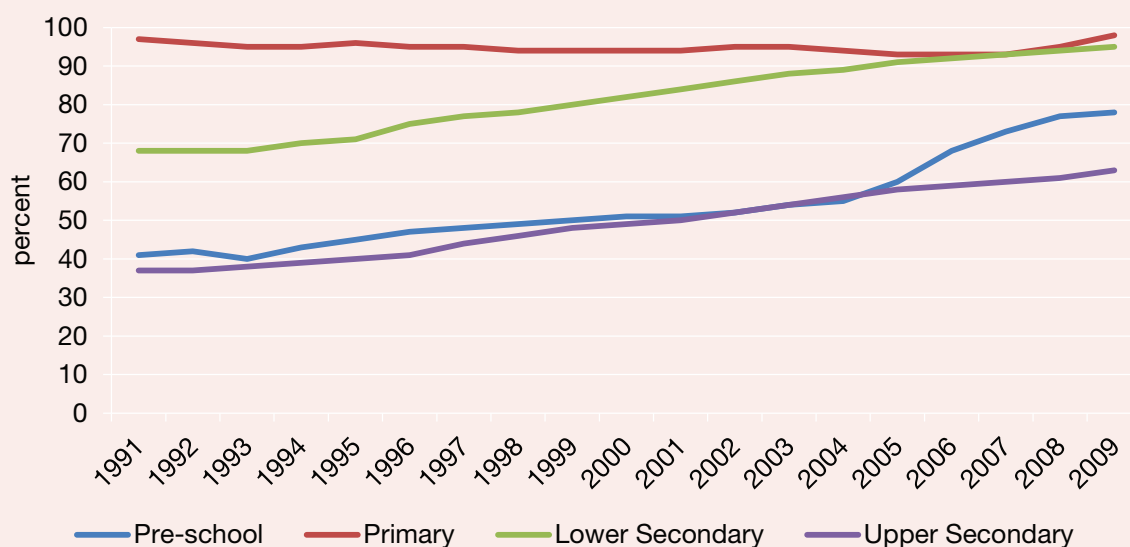
increased the most, going from 40 percent in 1991 to nearly 80 percent in 2009. (Figure 3.1)

Mexico’s progress in increasing enrollments has nonetheless trailed that of some other Latin American countries. In 2000 both Mexico and Brazil had 52 percent of school-aged children in school. Mexico increased enrollments to 66 percent in 2009, but Brazil increased them to 81 percent.

Only half of Mexico’s 15–19 year-olds are enrolled in school compared to an OECD average of nearly 82 percent.⁶

Although enrollments are up, repetition is also high. Approximately 10 percent of children repeat first grade, even though promotion from first to second grade is supposedly automatic, and nearly 40 percent fail to complete primary school in the standard 6 years. One-third repeats at least one grade in primary or lower secondary (Figure 3.2).

Figure 3.1 Net enrollment rates, by level of education, national, 1991–2009

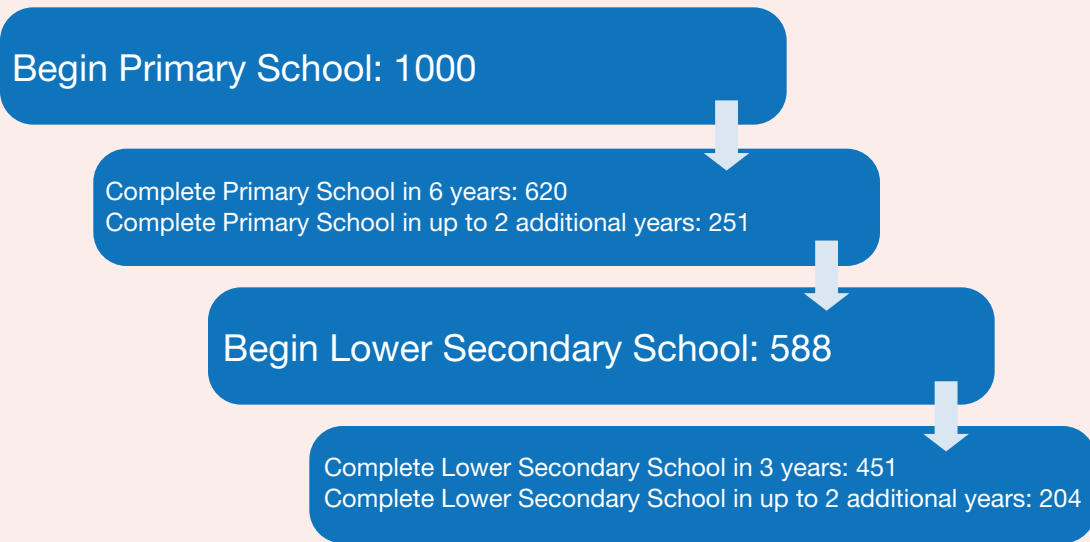


Source: Secretaría de Educación Pública. 2009. Sistema Educativo de los Estados Unidos Mexicanos, principales cifras, ciclo escolar 2008–2009. Dirección General de Planeación y Programación de la Secretaría de Educación Pública: México.

Indicators: for pre-school indicator used was atención de 3, 4 y 5 años. For primary, indicator used was cobertura (6 a 12 años); lower secondary was cobertura (13 a 15 años); and for higher secondary was cobertura (16 a 18 años).

6 OECD. 2011. *OECD Economic Surveys*. Mexico: OECD Publishing: 135.

Figure 3.2 Trajectory of the 1998/1999 enrolled cohort



Source: INEE. 2010. *El Derecho a la Educación en México: Informe 2009*. Instituto Nacional para la Evaluación de la Educación: México. Table 2.3: 66.

Note: The number of students who completed lower secondary school in 2 additional years includes students who took 7 or 8 years to finish primary school. The number of those who began lower secondary school excludes them.

Drop-outs rise sharply in upper secondary school (grades 10 through 12), and roughly half fail to graduate. Although over 95 percent of those who complete lower secondary school go on to upper secondary, many drop out, particularly after the first year. (Figure 3.3). Drop-out rates in upper secondary are considerably higher than they are at lower levels.⁷ Moreover, these high drop-out rates in upper secondary contribute to the increase of the “*nini*” population, a colloquial term used to define young people who neither study nor work (*ni estudian, ni trabajan*). According to the OECD, in 2008 nearly 20 million young people ages 15–29 (66.4 percent of this age group) were out of school. Of these, 65 percent were employed, leaving 35 percent (6.7 million people ages 15–29) neither studying nor working. This group is more likely to enter the informal labor market, and is less likely to advance economically.

Mexico’s low coverage at the upper secondary level sets it apart from all other OECD countries, and from many poorer Latin American countries. Despite doing relatively well in

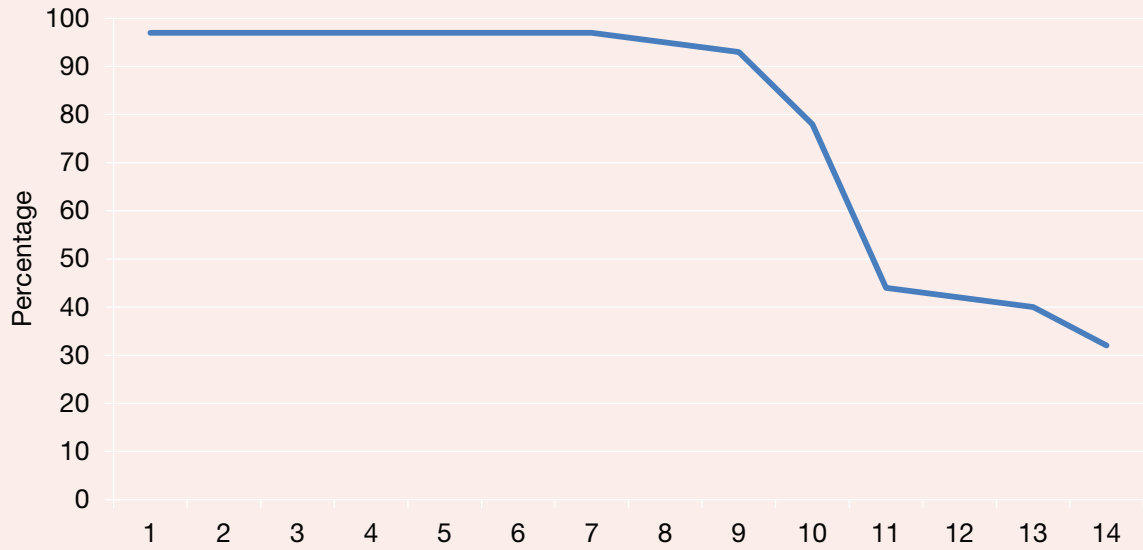
getting children through primary school, it is much less likely to get children through upper secondary school (Figure 3.4). Since upper secondary graduates often fill skilled and technical positions, and can play an important role in raising productivity, their relative absence in Mexico constitutes a bottleneck in the country’s competitiveness.⁸

Mexico’s tertiary enrollments lag the Latin American average, and are far behind those of high income countries such as Finland and the United States. (Figure 3.5) This low production of university graduates is likely to constrain Mexico’s efforts to move from a low-cost labor-based economy to a knowledge-based economy. To be sure, there has been some improvement. Enrollments at the tertiary level

7 SEP, 2009. Sistema Educativo de los Estados Unidos Mexicanos, Principales cifras, ciclo escolar 2008–2009. Dirección General de Planeación y Programación de la Secretaría de Educación Pública: México.

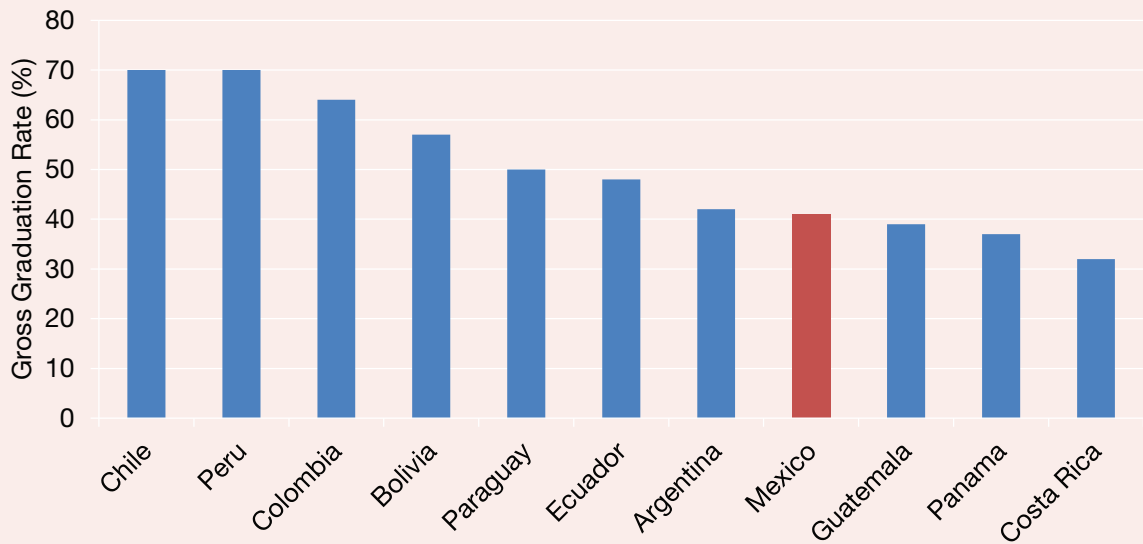
8 Research on the cause of high drop-out rates for upper secondary is inconclusive. Despite efforts by the public and private sector to reduce these rates, it is not clear whether they are a consequence of a lack of supply, an economic need, or lack of interest among youths. A study conducted by SEP (2007), using data from the Censo 2000, showed that of the population aged 15–19 who had dropped out, 35.5 percent had done so because they either had to work or lacked the money, 32 percent had done so because of lack of interest, 21 percent because of a non specified reason, and 10 percent for family reasons. SEP. 2007. Panorama de la Educación Media Superior en México 2008. Presentación. México: Subsecretaría de Educación Media Superior.

Figure 3.3 Progression through the system



Source: Secretaría de Educación Pública. 2008. Subsecretaría de Educación Media Superior. Panorama de la Educación Media Superior en México: México.

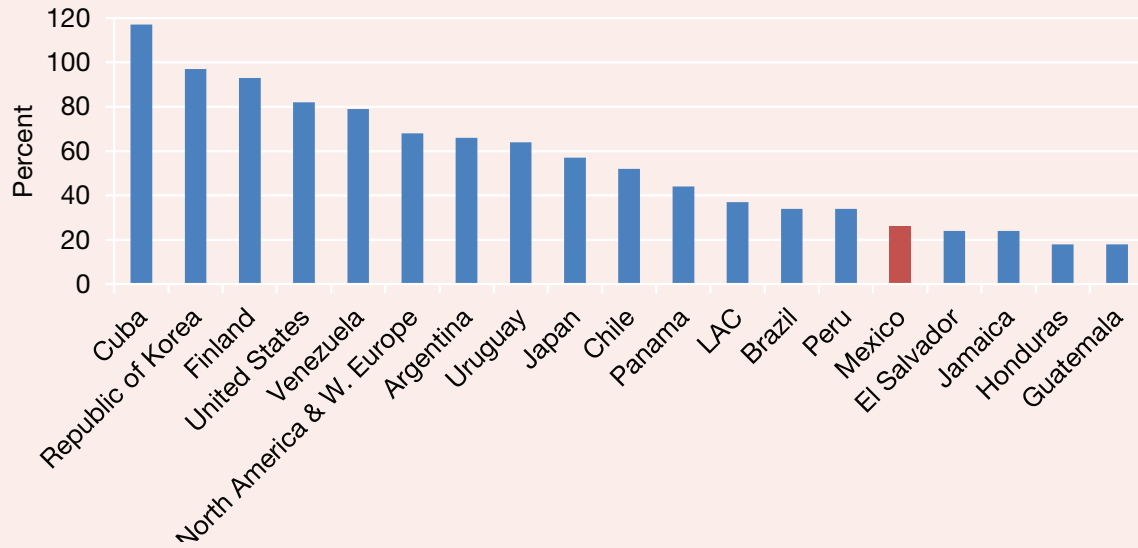
Figure 3.4 Upper secondary gross graduation rates, 2007, selected countries



Source: UNESCO. 2010. Global Education Digest 2010. Montreal: UNESCO Institute of Statistics.

Figure 3.5

Gross enrollment rates, tertiary education, selected countries, 2008



Source: UNESCO 2010. *Global Education Digest 2010*. Montreal: UNESCO Institute of Statistics.

Note: GER is the number of students enrolled in a given level of education, regardless of age, expressed as a percentage of the 5 year age group following the official secondary school graduation age.

for the whole population went from 18 percent in 1999 to 30 percent in 2008.⁹

Spending

Spending on education in Mexico is high relative to GDP, but low in absolute per-student terms. Mexico allocates a significant proportion of its national output to education.¹⁰ Over the past 20 years, public spending on education has risen from 3.7 percent of GDP to 4.8 percent, and is now just below the OECD average of 5.2 percent. Nearly one-quarter of the public budget is spent on education, higher than any other country in the OECD, and well above the OECD average of 13 percent.¹¹

Expenditure per student, however, is roughly one-third of the OECD average at all levels. For example, in 2007, Mexico spent \$2,111 (PPP) dollars per student in primary school,

whereas OECD countries spent \$6,741 PPP. Spending per student at the lower secondary level was \$1,814 PPP. This contrasts with the \$7,598 PPP that the OECD countries spend. At higher levels the discrepancy is greater. Mexico spent around \$3,070 per student in upper secondary and \$6,971 PPP for each student in higher education. The average for the OECD countries is \$8,746 PPP and \$12,907 PPP respectively. (Table 3.2)

Most public spending on education is devoted to the salaries of teachers and administrators. Of the federal budget spent on education, 97 percent goes to fund current (salary) costs.¹² Of the OECD countries, only Portugal spends more of its public basic education budget on salaries (see

9 UNESCO. 2010. *Global Education Digest 2010*. Montreal: UNESCO Institute of Statistics.

10 Approximately 80 percent comes from the federal government, and 20 percent comes from state and local governments. SEP. 2010. *Sistema Educativo de los Estados Unidos Mexicanos, Principales cifras, ciclo escolar 2009–2010*. Dirección General de Planeación y Programación de la Secretaría de Educación Pública: México.

11 OECD. 2010. *Improving Schools: Strategies for Action in Mexico*. OECD Publishing: 49.

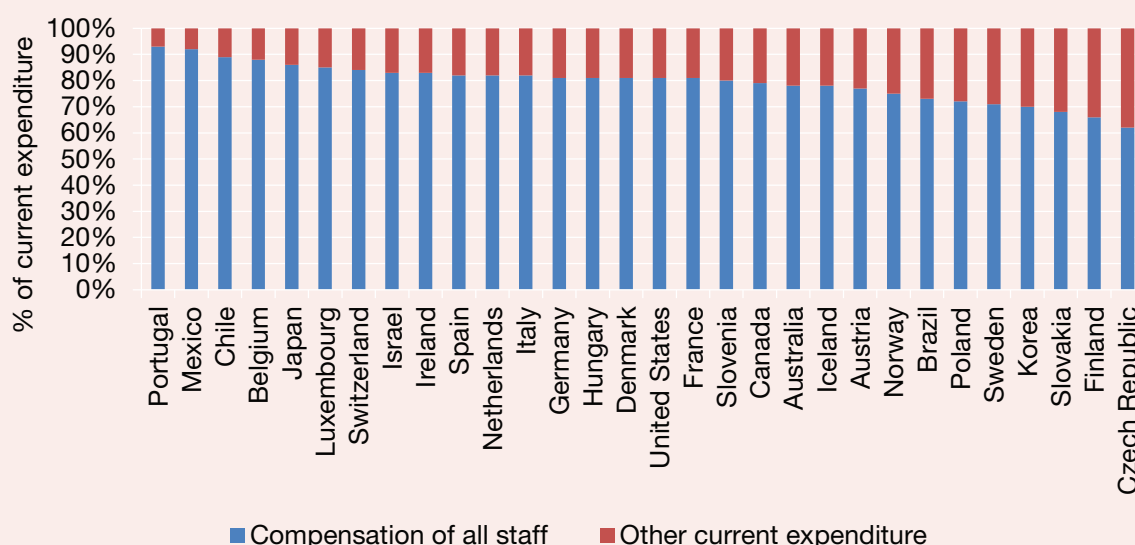
12 Campos, M., Jarillo B., and L. Santibáñez. 2010. *Gasto en Educación: La eficiencia del financiamiento educativo en México*. Programa Presupuesto y Gasto Público: ¿Gastamos para mejorar? Centro de Análisis de Políticas Públicas. Mexico: México Evalúa.

Table 3.2 Spending per student for each education level, Mexico and the OECD, 2007

Education level	Mexico	OECD
primary	2,111	6,714
lower secondary	1,814	7,598
upper secondary	3,070	8,746
tertiary	6,971	12,907

Source: OECD. 2010. *Education at a Glance: OECD Indicators*. OECD publishing: Paris, France. Table B1.1a, p. 202.

Figure 3.6 Current operating costs as a percentage of public basic education spending, 2008



Source: OECD. 2010. *Education at a Glance: OECD Indicators*. OECD publishing: Paris, France. Table B6.1: 258.

Notes: 1. Public institutions only. 2. Year of reference 2008. 3. Some levels of education are included with others. 4. Year of reference 2006.

Figure 3.6). Spending on salaries is one of the categories that has grown the most in the past decades.^{13 14}

13 This has been attributed to the “double” bargaining that many states must now endure after the government decentralized education in the early 1990s. Before, collective bargaining was done once, between the federal SEP and SNTE leaders. Now, after the federal negotiation, each state (or section) SNTE leader re-negotiates the terms of the collective bargaining agreement taking as a starting point any improvements negotiated at the federal level. This virtually ensures that salary increases will be higher in most cases. For references, please see Andrere E. 2006. *México sigue en riesgo: El monumental reto de la educación en México*. Mexico: Editorial Planeta Mexicana; and Villanueva, P. 2009. *Transferencias federales para educación y gasto en nómina magisterial de los estados 1900–2004*. Finanzas Públicas, Vol 1.

14 Guichard, S. 2005. *The Education Challenge in Mexico: Delivering Good Quality Education to All*. OECD Economics Department Working Paper 447, OECD Publishing.

The fact that the vast majority of budgets are tied up in salaries is problematic for two reasons. First, the national teacher’s union enjoys a monopoly over labor relations in the education sector, controlling teachers’ salaries, tenure, teacher career ladders, selection and teacher assignment, and other key processes. The Secretary of Public Education is left with little—if any at all—control over this vast budget.

Second, because so little is left after paying the teacher and administrator wage bill, Mexican schools are seriously

under-resourced. Basic school construction, maintenance and facility issues plague communities across the country. According to data from INEE, over one-quarter of public schools in Mexico have serious maintenance and upkeep problems. Over 75 percent of public primary schools, and over 95 percent of indigenous schools, do not have computer or library facilities. In 15 percent of rural schools, teachers do not have a chair and/or desk to sit in.¹⁵ At the primary level, only 1.9 percent of Mexico's budget goes for capital spending, compared with an OECD average of 7.8 percent; at the secondary level it is 3.2 percent compared with 7.4 percent for the OECD; at the tertiary level it is 4.8 percent compared to 9.8 percent.¹⁶

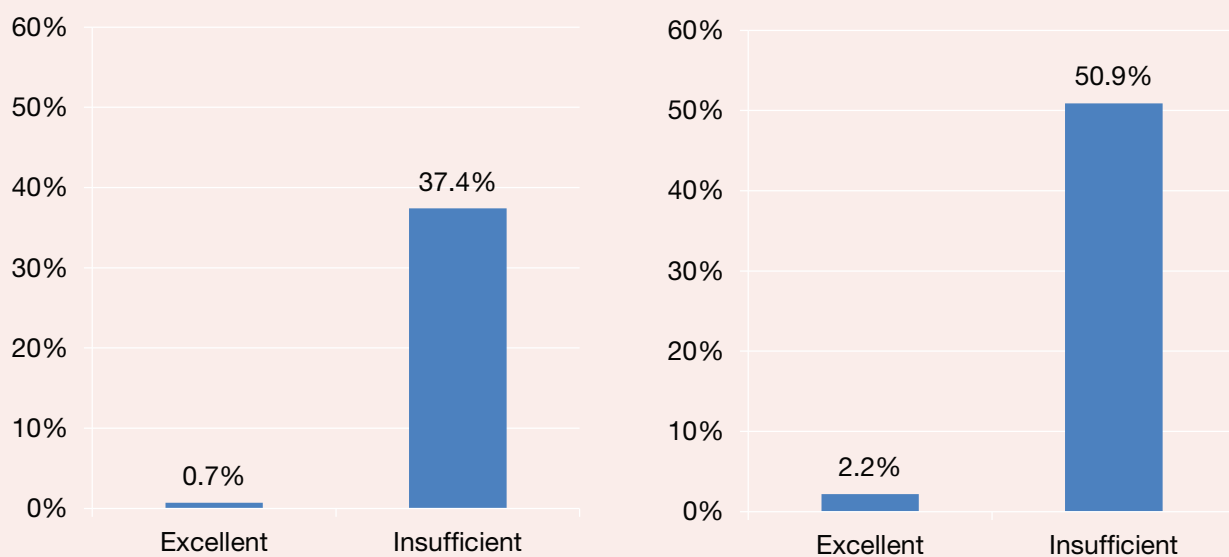
Quality

Most students fail to acquire the skills necessary to raise their productivity, improve their earnings and help the economy grow. Scores on national reading and math

exams are low, especially at the secondary level. For every Mexican student who scored at the top in reading in the 2010 ENLACE exam, 53 scored at the bottom. In math, for every student who scored at the top, 23 scored at the bottom. (Figure 3.7)

Scores on global student achievement tests tell a similar story. Mexico ranks in the bottom third (of 65 countries) in the OECD's 2009 PISA exam—which assesses what 15-year-olds know and can do in reading, math and science. Figure 3.8 shows how Mexico compares with PISA's highest scorer, Shanghai, in math. Roughly half the Mexican students scored at or below the lowest level, meaning that they cannot do more than “carry out routine procedures according to direct instructions in explicit situations”.¹⁷ Fewer than 6 percent scored at the top three levels. By contrast, almost none of the Shanghai students scored at the lowest level, and 70 percent scored at the top three levels.

Figure 3.7 Percent of students who scored at the highest and lowest levels on the 2010 ENLACE, 3rd grade and lower secondary, reading and math



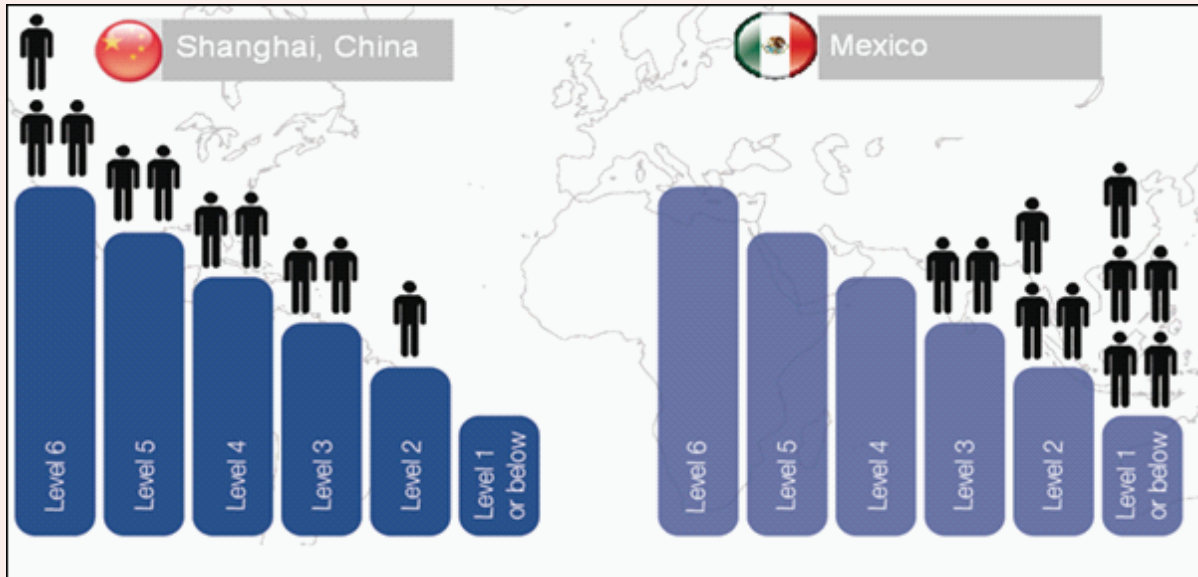
Source: Secretaría de Educación Pública. ENLACE 2010, <http://www.enlace.sep.gob.mx/ba/?p=penlinea>, (accessed June, 2011). Note: 4 levels grouped in excellent, good, basic and insufficient.

15 García, Adán Moisés, et al. 2007. *Infraestructura escolar en las primarias y secundarias de México*. México: INEE.

16 OECD. 2010. *Improving Schools: Strategies for Action in Mexico*. OECD Publishing: 50.

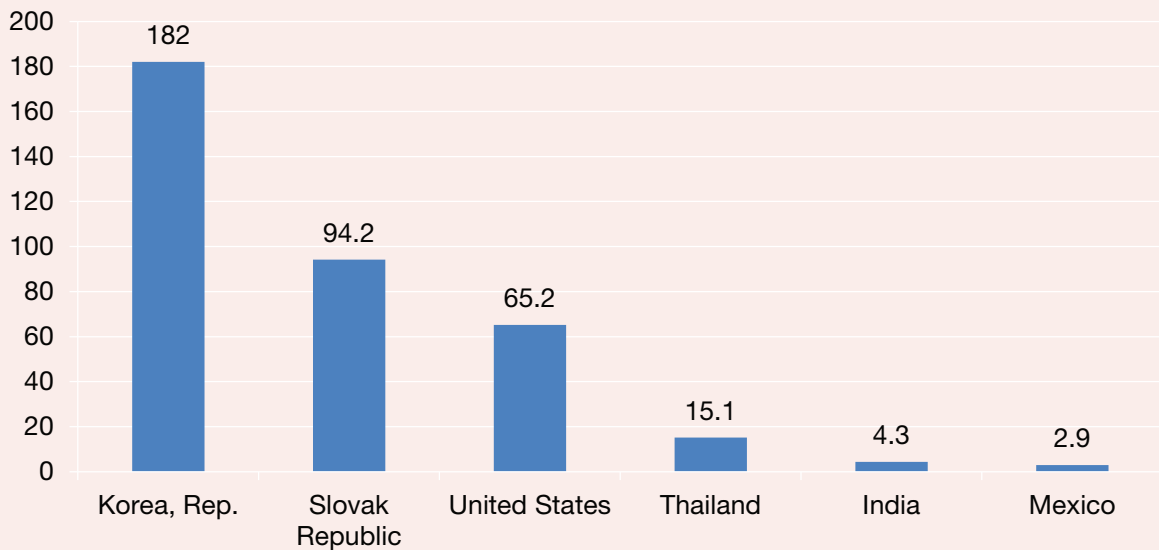
17 OECD. 2010. *PISA 2009 Results: What Students Know and Can Do*, Volume I. OECD Publishing: 132.

Figure 3.8 Students performing at each level in math, PISA 2009, Shanghai, China and Mexico



Source: Organization for Economic Co-operation and Development. 2010. *PISA 2009 Results: What Students Know and Can Do—Student Performance in Reading, Mathematics and Science (Volume I)*, OECD Publishing: table 1.3.1, p. 221.

Figure 3.9 Number out of 1,000 students estimated to be above 625 on PISA 2003 in math



Source: Pritchett, Lant and Martina Viarengo. 2009. Producing superstars for the economic Mundial: The Mexican Predicament with quality of education. In *Mexico Competitiveness Report 2009*, ed. Ricardo Hausman et al, 71–89. Switzerland: World Economic Forum and Harvard University Press.

Note: India did not participate in PISA 2003, so Pritchett & Viarengo estimated its performance based on a national assessment.

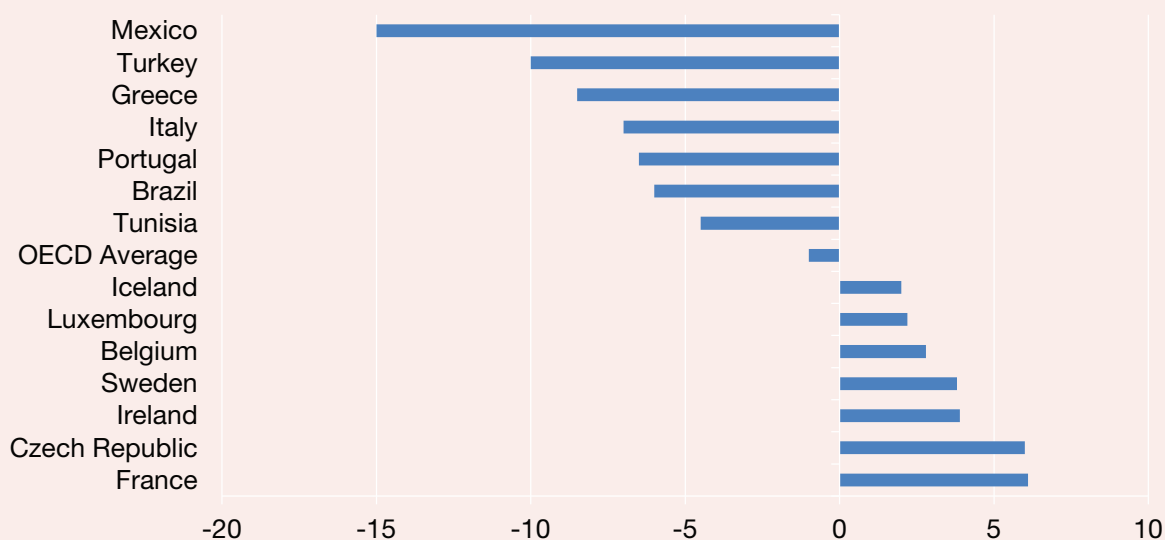
The near total absence of Mexican students at the top levels of learning is a serious constraint on the country's global competitiveness. A recent study noted that just 0.29 percent of Mexican students scored at the “advanced” international benchmark for math established by PISA as “capable of advanced mathematical thinking and reasoning, and [able] to interpret complex information about real world situations.” (Figure 3.9) These are the students who can compete in the market for ideas by adapting technologies to local conditions, developing global tradeables like financial services and product design, and generally putting together ideas in new ways. They are crucial to economic growth—particularly in a globalized economy. Mexico compares poorly with Korea (18.2 percent) and the United States (6.5 percent)

in producing global performers. But its production of top performers is only half that of India (0.43 percent), even though the average Mexican student scores well above the average Indian student.^{18 19}

Still, compared to the rest of Latin America, Mexico does fairly well. For example, Mexico scored above the Latin American average (but well below the OECD average) in the 2009 PISA exam.²⁰ Its math scores improved more than any other participating country and the number of students scoring at or below the lowest level in math dropped from 66 percent to 51 percent—no small achievement. (Figure 3.10) Nonetheless, Mexico's scores in reading and science have remained stagnant, in contrast to improvements

Figure
3.10

Change in students performing at the lowest levels in PISA, 2003 to 2009, math



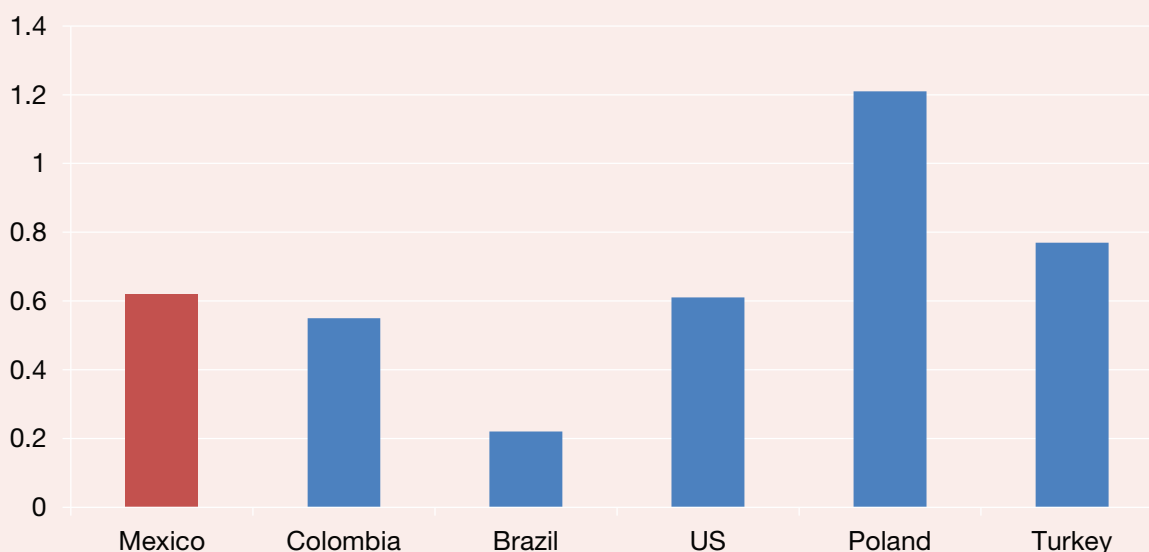
Source: Ganimian, Alejandro and Alexandra Solano. 2011. *Measuring Up? How Did Latin America and the Caribbean Perform on the 2009 Programme for International Student Assessment (PISA)?* Washington, DC: Preal Publications.

Note: All changes are statistically significant.

¹⁸ The distribution of scores in reading and science was similar.

¹⁹ Pritchett, Landt and Martina Viarengo. 2009. Producing superstars for the economic Mundial: The Mexican Predicament with quality of education. In *Mexico Competitiveness Report 2009*.

²⁰ Mexico has also placed well in other regional exams. In UNESCO's 2006 Second Regional Assessment (SERCE), which tested reading, math and science skills among third- and sixth-grade students from nearly every country in Latin America, Mexico scored consistently above the average. The state of Nuevo León scored above all but a few countries. Ganimian, Alejandro. 2009. *How Much Are Latin American Children? Highlights from the Second Regional Student Achievement Test (SERCE)*. Washington DC: Preal Publications, 2011.

Figure
3.11**Graduates of engineering undergraduate programs per 1000 inhabitants (2007)**

Source: Caudillo, Mónica and Lucrecia Santibáñez. 2010. Propuesta para el fortalecimiento de incentivos a la innovación y vinculación con el sector productivo en el Sistema Nacional de Investigadores. Fundación IDEA, with UNESCO data (2007). Note: Includes only graduates ("titulados").

by Chile and Brazil (in reading) and Brazil and Colombia (in science).

Mexico trains many engineers, compared to other countries, but there are doubts about their skill level.

The proportion of undergraduates studying engineering is almost as high in Mexico as in the United States, and higher than in Brazil. (Figure 3.11) However, employment survey data reveals that many of these engineers work in positions that would not normally require a university-level engineering degree.^{21 22} One recent study of human capital needs in two high-growth economic sectors²³, interviewed industry leaders about their perceptions of the quality of university graduates. The interviews suggested that in many cases, engineering degrees in Mexico do not provide students with enough capabilities and skills, particularly in technical areas

(due to the fact that many engineers study in universities with limited laboratory and technical equipment). There was also a perceived lack of training in "soft skills" such as communication skills, ability to work independently, interpersonal skills and knowledge of English.

If most university graduates had the knowledge and skills commensurate with a good technical degree, their training would help the economy meet its human capital needs. Questions of cost and efficiency are important, however. Financing the cost of studying the equivalent of a technical degree in 4–5 years, instead of 2–3, is onerous for both the state (through support for public institutions of higher education) and for individual students (through reduced lifetime earnings and higher opportunity costs of education).

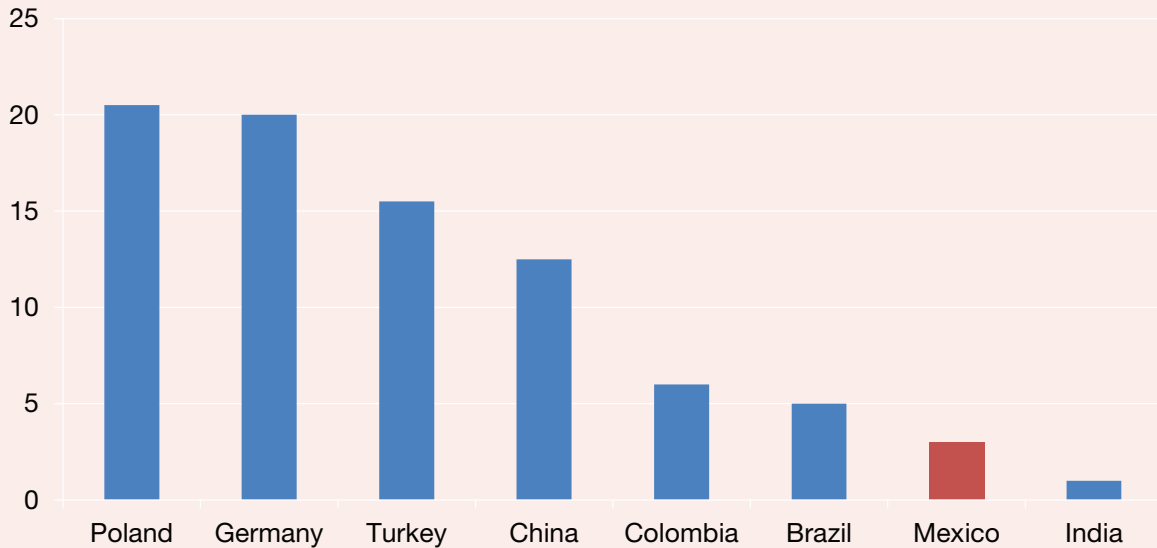
Technical institutions have not played their role of bridging school-work transitions. Technical education, as part of the upper secondary level in Mexico, was created for students who do not plan on going to tertiary education, but who still wanted to specialize in a career. However, in contrast to engineers, Mexico graduates very few technicians when compared to other countries (see Figure 3.12).

21 Estimate based on data from ENOE, first 2010 trimester. Data includes specialization in Civil, Extractive, Metallurgical, Computer, IT, Electrical, Electronical, Mechanical, Industrial, Transportation, Hydraulic, Aeronautical and Topographical Engineering. Some specializations are excluded, among the, Chemical, Environmental and Agricultural, which are difficult to distinguish in ENOE.

22 Caudillo, Mónica and Lucrecia Santibáñez. 2010. Propuesta para el fortalecimiento de incentivos a la Innovación y Vinculación con el sector productivo en el Sistema Nacional de Investigadores. Mexico: Fundación IDEA.

23 These two industries are Aerospace and manufacturing of electronic appliances.

Figure 3.12 Enrollment in vocational education programs at the upper secondary level, by 1000 inhabitants (2007)



Source: Caudillo, Mónica and Lucreacia Santibañez. 2010. Propuesta para el fortalecimiento de incentivos a la innovación y vinculación con el sector productivo en el Sistema Nacional de Investigadores. Fundación IDEA.

Although there is little hard evidence to gauge the quality of the technical education system (vis a vis the university system or even the “regular” high school system) it is widely believed that students do not want to attend technical colleges (i.e. CONALEP, or Technological Universities) and that the quality of education these systems offer is low.

Mexico has few high-quality universities. Only one Mexican university (the Universidad Nacional Autónoma de México—UNAM) ranks in the top 500 according to the 2010 Shanghai Academic Ranking of Top World Universities, and it is well down the list, in the group between 151 and 200. The London Times Higher Education Supplement’s 2010 ranking of the world’s 200 top universities ranks UNAM at number 190. To be sure, several high quality Mexican higher education institutions are too specialized to qualify as universities (such as ITAM, CIDE and Monterrey Tech) and so are not included in the rankings. But clearly, high-quality universities are uncommon in Mexico.

Mexico’s scientific output is weak and largely takes place outside of universities. In 2009, only 8 percent of the inventions registered in the country came from universi-

ties. The majority came from individual inventors or private corporations (Figure 3.13).

In 2009, Mexico was granted 330 worldwide patents—a rate of 3 patents per million population. Hong Kong, which is smaller than Mexico, was granted 510 patents—a rate of 73 per million. Still, Mexico fared better than its Latin American counterparts—Brazil had 1.5 patents per million people, Argentina 2, and Peru 0.5—and tied only with Chile.^{24 25} (Figure 3.14)

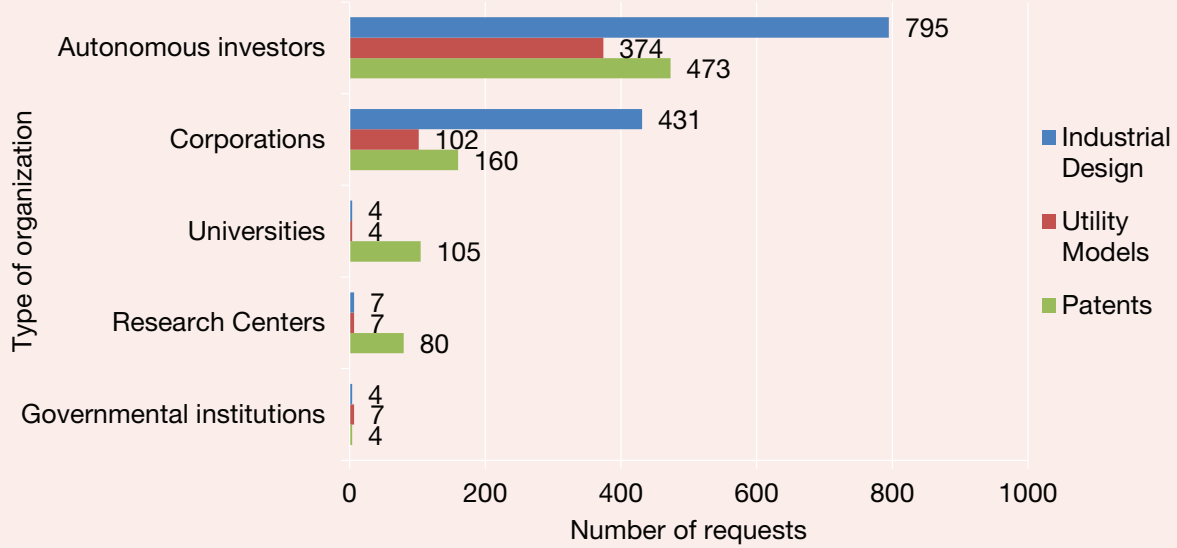
In the World Economic Forum’s 2010 Global Competitiveness Report, Mexican business executives ranked the country 89th out of 139 in the availability of engineers and scientists.

A recent analysis of the country’s system of promoting science and technology development and innovation (CONACYT) found that it does not do enough to promote

24 WIPO (World Intellectual Property Organization) publishes an annual report based on their Statistics Database, which collects data from intellectual property offices around the world through its annual questionnaires. WIPO estimates patents, utility models, trademarks and industrial designs. Data for patents granted is from WIPO Index for patents systems, <http://www.wipo.int/ipstats/en/statistics/patents/>.object: WIPO Index for patents systems (accessed July 8, 2011).

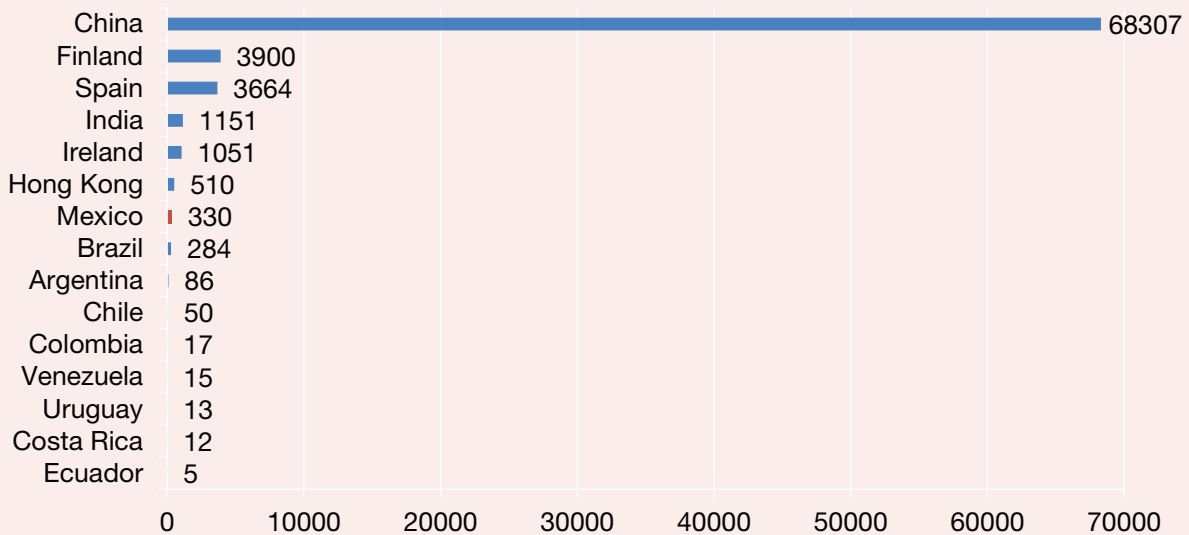
25 World Intellectual Property Organization 2010. *World Intellectual Property Indicators*. WIPO Publication No. 941(E). Geneva: WIPO Publications.

Figure 3.13 Inventions in Mexico by type of organization, 2009



Source: Caudillo, Mónica and Lucreacia Santibañez. 2010. Propuesta para el fortalecimiento de incentivos a la innovación y vinculación con el sector productivo en el Sistema Nacional de Investigadores. Fundación IDEA.

Figure 3.14 Worldwide patents granted by country of origin, 2009, in absolute numbers



Source: WIPO Index for parents systems, <http://www.wipo.int/ipstats/en/statistics/patents/>; object: WIPO Index for parents systems (accessed July 8, 2011).

innovation and cutting edge research and development. It also generates weak linkages between universities and industries, and fails to give researchers incentives to innovate. Furthermore, there are few avenues in Mexico for venture or seed capital that could support this kind of endeavor and reward researchers and scientists for doing empirical and applied research.²⁶ Mexico's approach to science and technology does not appear to be helping the country avoid the much-discussed "Middle Income Trap," in which countries can neither compete on the basis of low wages, nor on the basis of knowledge-intensive innovations.

Equity

Mexico's education system appears to have only a limited impact on reducing inequality. Children from poor families are more likely to repeat grades and to drop out than their rich counterparts, and less likely to enroll in the univer-

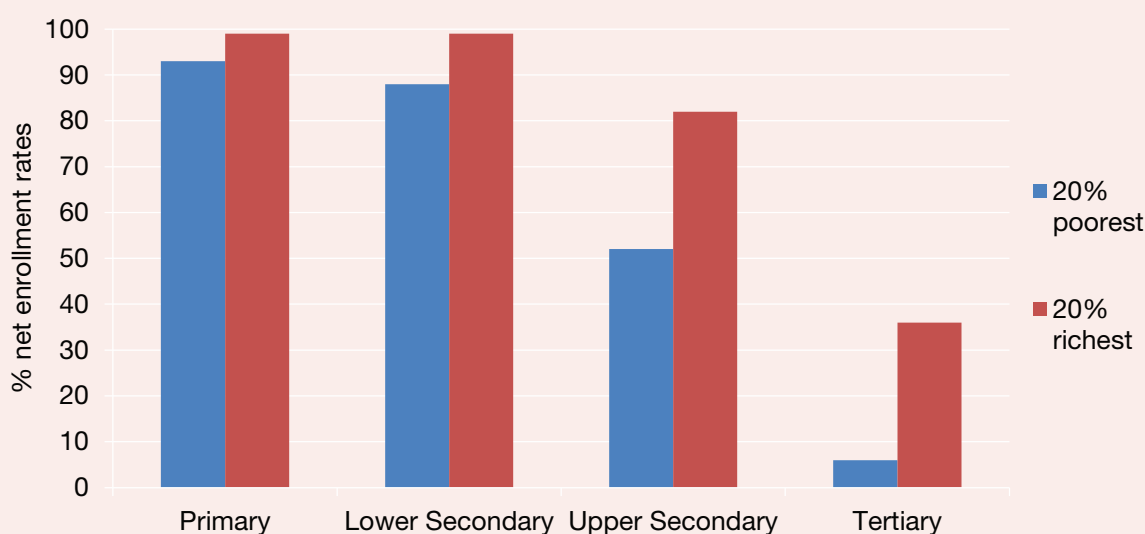
sity. Those poor children who do stay in school tend to learn less, in part because of the low quality of public schools.

Inequality increases at each level of education. Although the poor are almost as likely as the rich to attend primary school, the gap widens at the lower secondary level, and becomes large at the upper secondary and tertiary levels. Only half of children from the poorest sectors enroll in upper secondary, compared to four-fifths from the richest sectors. At the tertiary level, only 6 percent from the poorest sector enroll, compared with 35 percent from the richest. (Figure 3.15)

The gap between rich and poor is high even compared to other countries in the region. In Mexico, a rich student is six times more likely to complete upper secondary than a poor student, while in Chile and Argentina, a rich student is twice as likely. (Figure 3.16)

Poor children who remain in school also tend to perform at levels well below children from rich families. In Mexico, a

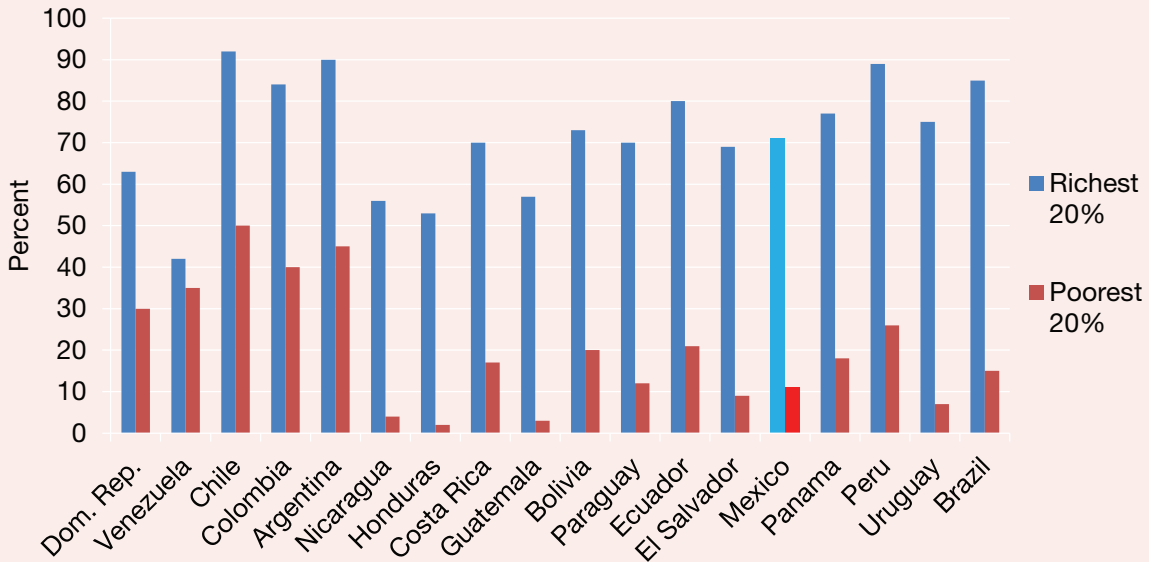
Figure 3.15 Percentage of the school age population enrolled in school, by poorest and richest quintiles, national, 2006



Source: INEE. 2008. Panorama Educativo en México 2008: *Indicadores del Sistema Educativo Nacional*. Instituto Nacional para la Evaluación de la Educación: Mexico D.F.

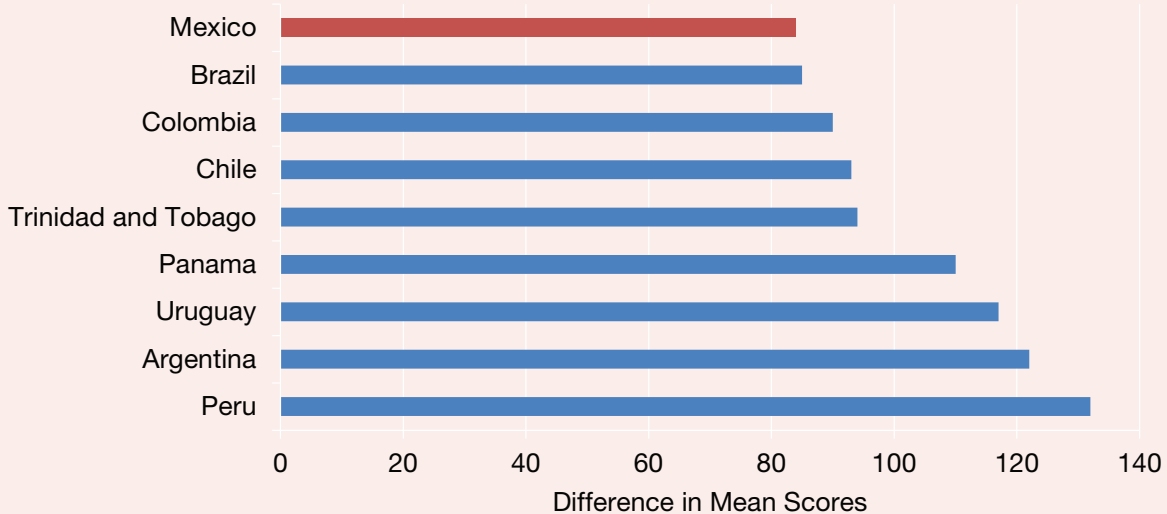
26 Caudillo, Mónica and Lucrecia Santibáñez. 2010. Propuesta para el fortalecimiento de incentivos a la Innovación y Vinculación con el sector productivo en el Sistema Nacional de Investigadores. Mexico: Fundación IDEA.

Figure 3.16 Population Aged 20–24 that Has Completed Upper Secondary Education, Poorest 20% vs. Richest 20%, 2005



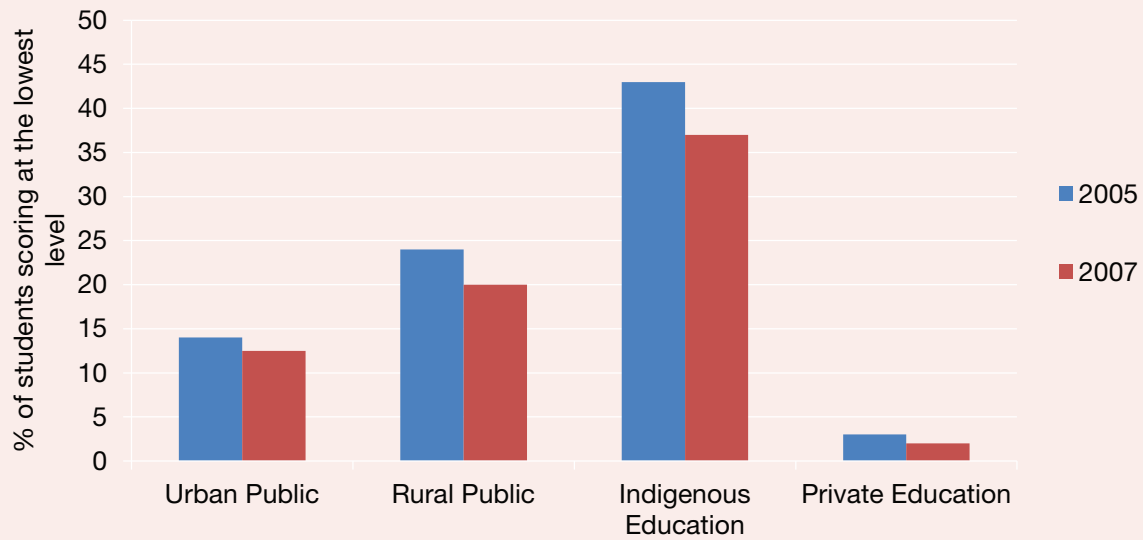
Source: UNESCO/PRELAC. 2007. *The State of Education in Latin America and the Caribbean: Guaranteeing Quality Education for All*, Santiago: OREALC/UNESCO.

Figure 3.17 Difference in mean scores between rich and poor students on PISA reading test, 2009



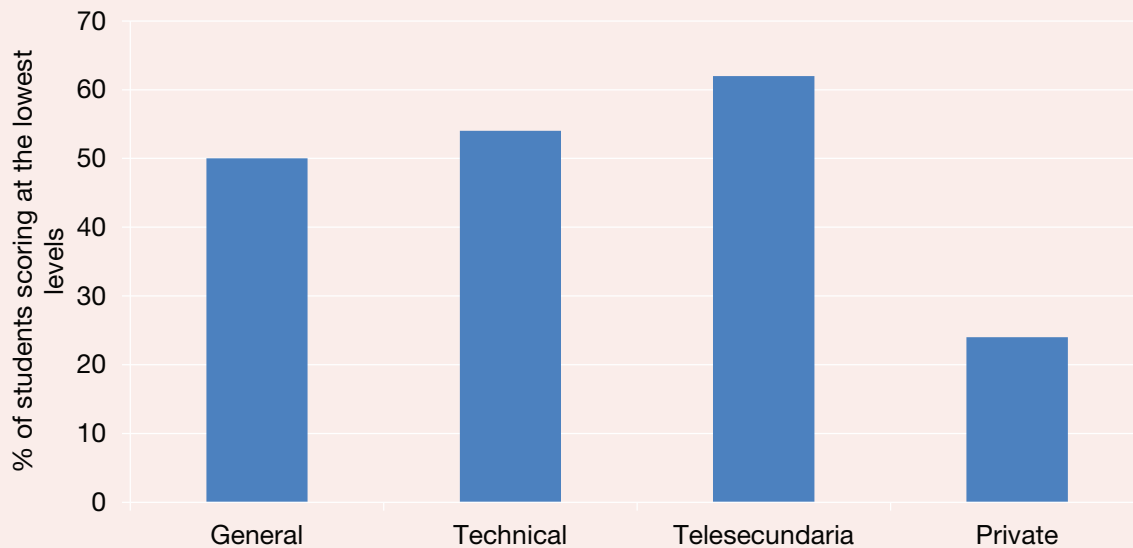
Source: Adapted from Ganimian, Alejandro and Alexandra Solano. 2011. *Measuring Up? How Did Latin America and the Caribbean Perform on the 2009 Programme for International Student Assessment (PISA)?* Washington, DC: Prael Publications.

Figure 3.18 Percentage of students who scored at the lowest level for EXCALE, math, 6th grade, primary, 2005 and 2007

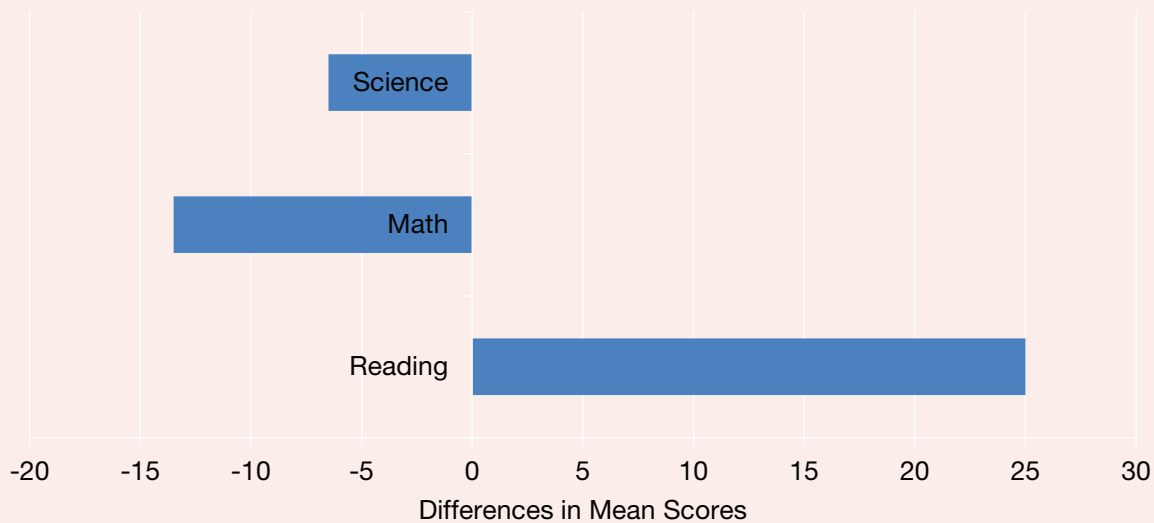


Source: INEE. 2009. *Panorama Educativo de México 2009: Indicadores del Sistema Educativo Nacional. Educación básica.* Instituto Nacional para la Evaluación de la Educación: Mexico D.F.: 232.

Figure 3.19 Percentage of students who scored at the lowest level for EXCALE, math, 3th grade, lower secondary, 2008



Source: INEE. 2009. *Panorama Educativo de México 2009: Indicadores del Sistema Educativo Nacional. Educación básica.* Instituto Nacional para la Evaluación de la Educación: Mexico D.F.: 232.

Figure
3.20**Differences in mean scores between girls and boys on PISA 2009, all subjects**

Source: Adapted from Ganimian, Alejandro and Alexandra Solano. 2011. *Measuring Up? How Did Latin America and the Caribbean Perform on the 2009 Programme for International Student Assessment (PISA)?* Washington, DC: Preal Publications.

Notes: 1) All differences in mean scores are statistically significant. 2) An advantage of 39 points in reading is equivalent to a grade level in an OECD country.

15 year-old from a low-income family scores two grade levels below the wealthiest students in reading. This is a region-wide problem, however, and Mexico's performance is similar to that of Brazil, and better than other LAC countries participating in the PISA exam. (Figure 3.17)

Children who attend indigenous and rural schools also learn less than their counterparts.

Results from the most recent EXCALE²⁷ assessment suggest that nearly 45 percent of 6th grade students in indigenous schools and 24 percent of students in rural schools scored at the lowest level in Math, compared to just 2.7 percent for students in private schools. (Figure 3.18)

Results for lower secondary are similar, with over half of students in Telesecundarias (a school type that mostly enrolls students from rural areas) scoring at the lowest level in math, compared to roughly one-fourth of students from private schools. (Figure 3.19)

Indigenous populations are particularly likely to have less education: 55 percent of indigenous adults either

did not go to school or did not complete elementary school, compared to 29 percent of the country's total population, and fewer than 3 percent have attended the university, compared to 15 percent of non-indigenous who have.²⁸ Although a relatively small proportion (around 7 percent) of Mexico's population is indigenous, this group has historically been marginalized, and education appears to have done little to decrease the opportunity gap.

On the other hand, Mexico has made big strides in gender equity, and is close to reaching gender parity in terms of school enrollments and graduation rates. Girls tend to perform better than boys in reading, worse than boys in math, and worse only sometimes in science.²⁹

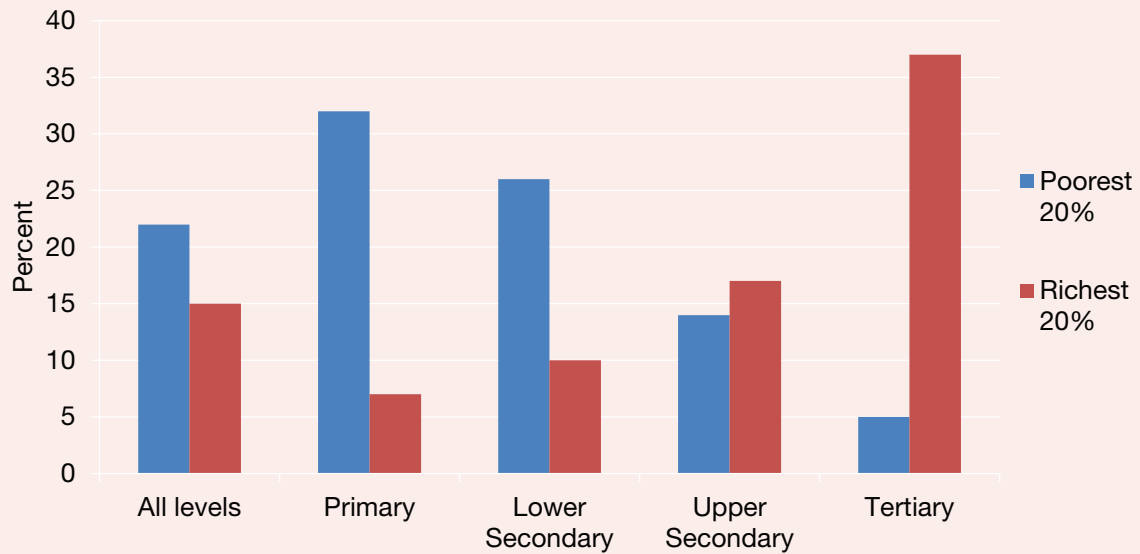
Public spending on primary and lower secondary education in Mexico appears to be largely pro-poor, since most upper-class families do not use the public system, opting instead to send their children to private primary and secondary schools. But public spending on higher levels

28 Barrera, Iván J., David Calderón, and Antonio De Haro. eds. 2010. *Brechas: Estado de la Educación en México 2010*, Mexico: Mexicanos Primero Visión 2030, A.C.

29 Ganimian, Alejandro and Alexandra Solano. 2011. *Measuring Up? How Did Latin America and the Caribbean Perform on the 2009 Programme for International Student Assessment (PISA)?* Washington, DC: Preal Publications.

27 EXCALE is a standardized evaluation applied to students in last grades of primary and lower secondary and measures their performance in reading, math, and social and natural sciences.

Figure 3.21 Percent of public education spending going to the richest 20% and poorest 20%, Mexico, 2006



Source: Adapted from Esquivel G., Lustig N., and Scott J. México. 2010. *A Decade of Falling Inequality: Market Forces or State Action?* In *Declining inequality in Latin America*, ed. L. López-Calva and N. Lustig, 175–217. Washington DC and New York City: Brookings Institution and United Nations Development Programme.

Table 3.3 Public spending per student for each education level, Mexico, 2009

Education level	Thousands of USD, per student
pre-primary	1,038
primary	1,000
lower secondary	1,500
upper secondary	1,700
tertiary	4,500

Source: Secretaría de Educación Pública. 2010. Principales cifras, ciclo escolar 2009–2010: 180.

Note: Figures were originally in thousands of pesos, and were converted to thousands of USD using 2009 exchange rate (www.xe.com, 1 USD= 12.9 MXN). Original figures (in thousands of MXN) were, in order of education level of table, 13.4, 12.2, 18.7, 21.8 and 57.6.

of education, particularly universities, tends to be a huge subsidy to the richest 20 percent of the population, since the vast majority of students from poor families fail to complete upper secondary school (Figure 3.21). Mexico’s policy of not charging tuition in public universities leads it to spend considerably more (4.5 times as much) on university students than on primary students, to the detriment of the poor. (Table 3.3).

Although education is widely agreed to be one of the most powerful tools for reducing inequality, it does not appear

to be playing that role in Mexico. Rich students are much more likely to stay in school, score higher on achievement tests, and attend free public universities. Poor students have no option to attending low-quality public primary and secondary schools that do little to raise their productivity or prepare them for the university.

The teaching profession is weak and poorly managed. Teacher quality has a greater impact on student

learning than any other factor in a school.³⁰ According to a leading analyst, “The quality of the teachers in our schools is paramount: no other measured aspect of schools is nearly as important in determining student achievement.”³¹ A recent McKinsey and Company review of successful education systems worldwide concluded, “the quality of an education system cannot exceed the quality of its teachers.”³² This is particularly true for children from poor families, who often cannot rely on parents or family members for help with school work, and whose homes have fewer educational resources, like newspapers and books.³³

The few indicators we have suggest that teacher quality is low in Mexico, and that the poorest children are likely to be taught by the most inexperienced, least prepared teachers. This is so for several reasons.

First, no serious effort has been made to recruit the top students into the teaching profession. Teaching positions in many parts of the country are still bought and sold, or passed on to relatives, rather than being awarded to the most talented applicant—a practice established many years ago by the Institutional Revolutionary Party (PRI) to reward party loyalists.

An entry exam established in 2007 (the Concurso Nacional de Oposición) has the potential to raise standards, but has failed to do so because most state governments ignore it.³⁴ Instead, as of 2008, states opt to award a majority of teaching positions via traditional channels (decisions by the teachers union and state officials), which may or may not be based on merit or teaching promise.³⁵

Most teachers graduate from low-quality, low-prestige teacher training institutions.³⁶ The government has not established the high minimum standards and rigorous

supervision that might raise the quality and prestige of these institutions. Nor does it offer incentives, such as full-stipend teacher training scholarships, to candidates with high test scores that might lead top students to consider a career in teaching. Also, students must decide at an early age (just after high school) whether they want to become teachers rather than waiting until after they have completed the university—severely limiting the pool of candidates, and keeping many otherwise talented youths from becoming teachers.

The government has not developed alternative training programs, with higher standards, that might attract more able candidates. Teachers’ salaries, while not low in relative terms (once hours worked, vacations and fringe benefits have been considered), are not keyed to performance and do little to attract achievement-oriented youth. Consequently, a major incentive to become a teacher is job security (it is nearly impossible to dismiss a teacher), which may not be the best way to attract top candidates.

Other than those with a very strong vocation for teaching, this combination of incentives and training tends to attract to the teaching profession candidates with few other career options. The problem is particularly acute for teachers in rural and indigenous communities, where few special incentives have been established to compensate for the hardships involved in working there. Until recently, teachers in these areas were chosen largely because they speak an indigenous language, with less priority given to their education, experience or aptitude for teaching. Even so, there are indications that a large proportion (around one-third) of indigenous teachers are sent to communities that speak a different indigenous language than their own.³⁷

Second, teachers are generally not well trained. Pre-service programs are not required to meet high standards, and tend to place too much emphasis on theory and too little on subject-matter knowledge and practice. The government has not established clear standards of professional practice that define what teachers must know and do in the classroom—and therefore what skills training

30 OECD. 2010. *Improving Schools: Strategies for Action in Mexico*. OECD Publishing: 69.

31 Hanushek, Eric A. 2011. *Valuing Teachers: How much is a good teacher worth?* *Education Next* 11 no. 3.

32 Barber, Michael and Mona Mourshed. 2007. *How the World’s Best School Systems Stay on Top*. McKinsey&Company.

33 Umansky I. and Emiliana Vegas. 2007. *Inside Decentralization: How Three Central American School-Based Management Reforms Affect Student Learning Through Teacher Incentives*. *The World Bank Research Observer*. 22, no. 2: 197–215.

34 On average, only 7 percent of the vacant teaching positions are awarded by the Concurso. See Coalición Ciudadana por la Educación, Comunicado de Prensa 004, Junio 2011.

35 Results from the 2010 Concurso suggest higher participation from many states but it remains unclear how it will change or affect teacher quality.

36 Santibáñez, Lucrecia. 2008. *Reforma Educativa: El papel del SNTE*. *Revista Mexicana de Investigación Educativa*, 13 no. 37: 81–105.

37 A study (Santibáñez, 2010) showed that indigenous teachers in Chiapas were significantly less qualified than Spanish speaking teachers. Santibáñez, Lucrecia. 2010. *Teacher Quality in Indigenous and Rural Schools: The Case of Chiapas*. Unpublished Working Paper. However relevant these findings may be, they cannot be externalized to the country as a whole, but lead to a need to conduct more research to grasp the issue of indigenous teacher’s training, motivation, incentives and qualification.

programs should provide. Limited data suggest that a large proportion of teachers are below par in knowledge and skills. The share of questions that an average Mexican teacher could answer correctly in a national teacher knowledge exam³⁸ in 1996–2000 was just 50 percent.^{39 40} Once trained and hired, novice teachers seldom receive much orientation or mentoring. No systematic program of induction has been established to provide new teachers with the support, assessment and feedback necessary to become effective.

In-service training is widely available,⁴¹ but appears to have little impact on student learning. Much of this training applies a “one-size-fits-all” model and seldom includes school visits, teacher networks or collaborative projects. Professional development and other in-service training should be used to complement and enhance teacher knowledge and skills, and not to substitute for deficiencies in pre-service training.

Third, teacher performance is not properly evaluated or rewarded. The existing system has fostered a culture where excellence and merit do not matter. Teachers are given lifetime tenure after six months of service with little concern for the quality of their work. Salaries are almost entirely unrelated to performance. The main teacher evaluation and incentive program (*Carrera Magisterial*) suffers from poor design. Until 2011, majority weight was given to factors (seniority, academic degrees, in-service training courses and peer evaluations) that have little impact on student achievement. Also, until 2011 teachers who passed the exam and were “incorporated” into the program received a salary bonus for the rest of their career, even if they never re-took the test.

President Calderón just announced a reform of *Carrera Magisterial* that would make teacher performance evaluations more rigorous. Student achievement would now count for 50 percent of the total score (up from 20 percent), teachers would be required to re-take the test periodically in order to continue receiving their bonus, and new factors, such as a self-appraisal of teacher competence as well as teacher attendance and punctuality, would be introduced. It remains

to be seen, however, whether these changes will in fact be approved and properly implemented. Until then, it is unclear that the reforms will be enough to make *Carrera Magisterial* a meritocratic system for rewarding good teaching.

Regardless, neither *Carrera Magisterial* nor any other government programs currently in place do anything to remove ineffective teachers from the classroom. Principals do not have the authority to dismiss teachers, or even to recommend dismissal. More generally, there is little in Mexican law that allows schools to dismiss ineffective teachers.⁴² A high-quality system needs not only to reward excellent teachers; it also needs to impose consequences, including dismissal, for those who are ineffective or lazy.

Fourth, the national teacher’s union (Sindicato Nacional de Trabajadores de la Educación—SNTE) has far too much power over teacher management and education policy. By decree (passed more than 60 years ago), only one teachers’ union can exist, and every public school teacher—and most administrative staff—must belong to it. SNTE was established as a virtual arm of the Partido Revolucionario Institucional (PRI) after the Mexican Revolution. It therefore enjoys a monopoly over the supply of public school teachers, and has veto power over such key issues as contracts, training, hiring, incentives, sanctions, and teacher placement.⁴³ Union representatives are often named to key posts in the SEP (nationally and at the state level), and work against government efforts to increase accountability, efficiency and transparency in the system. SNTE also has a substantial presence in the legislature (Cámara de Diputados) enabling it to influence legislation. Many union leaders have decades of experience, while SEP leaders are often politicians with little background in education, and are replaced frequently. SNTE also is legally entitled to “commission” teachers to take a paid leave of absence from teaching to do union work. Although no official data on commissioned teachers is available,

42 Recent evidence suggests that principals and SEP authorities prefer to deal with ineffective teachers through informal channels, and transfers to other schools or positions. Even in the most extreme cases, teachers exhibiting criminal behavior or engaged in physical conflict, it is extraordinarily hard to fire a teacher.

43 Raphael, Ricardo. 2007. *Los Socios de Elba Esther*. México: Planeta. See also: Santibáñez, Lucrecia. 2008. *Reforma Educativa: El papel del SNTE*. Revista Mexicana de Investigación Educativa. 13, 37: 81–105; Ornelas, Carlos. 2008. *Política, poder y pupilas: Crítica al nuevo federalismo educativo*. México: Siglo XXI Editores; Muñoz Armenta, A. 2005. *El sindicalismo mexicano frente a la reforma del estado. El impacto de la descentralización educativa y el cambio político en el sindicato nacional de trabajadores de la educación (1992–1998)*. México: Universidad Iberoamericana.

38 This refers to the *Carrera Magisterial*, national teacher incentive exam.

39 Very little data is available on teachers’ knowledge and skills, and more is needed.

40 Santibáñez and others. 2007. *Breaking Ground: Analysis of the assessments and impact of the Carrera Magisterial program in Mexico*. Technical Report. Santa Monica, CA: RAND/MG-141 (also available in Spanish).

41 The OECD Study “TALIS” found that Mexican secondary teachers receive twice as much in-service training as do their counterparts in other countries who participated in the study.

some estimate that over 10 percent of teachers are doing union work at any given time.⁴⁴ These activities, which often include electoral campaigns, amount to a public subsidy for the union's political agenda. No other union in Latin America enjoys as much monopoly power as SNTE.

The problem with SNTE's enormous influence over education is that, by definition, its mandate is to protect and promote the labor interests of teachers. Having SNTE effectively co-govern the education sector, and giving it a veto over policy, guarantees that the interests of teachers (or at least, of the teachers' union) will be placed well ahead of the interests of students. The result is political support for politicians who are willing to give SNTE relatively free rein, ironclad job security for teachers, and third-rate education for students.

Recommendations

Significantly improving Mexico's education system will take much time and effort. Many of the challenges are political, and require confronting powerful interest groups that have "captured" the education system and benefit from the status quo. These include the teachers union (SNTE) and politicians who use the education system for patronage. The demand for quality education, and for fundamental education reform, is weak. Parents have little information regarding how much their children are learning, and few effective mechanisms for acting even when they have a complaint. Employers have been largely silent, preferring to avoid conflict. Upper- and middle-class elites, who make most decisions on education policy, send their children to private schools and so do not directly experience the deficiencies of the public education system. Political leaders have been reluctant to challenge SNTE's power, opting instead either to offer concessions in return for political support, or to do nothing.

This may be beginning to change. Public opinion polls suggest that parental dissatisfaction with the school system, and with SNTE, is rising.⁴⁵ A broad network of national policy experts (the Autonomous Citizen's Council for Education) was formed four years ago and agrees generally on the nature of Mexico's education problems, and the need for

systemic change. Business leaders are increasingly supporting fundamental education reform initiatives. One good example is *Mexicanos Primero*, a high-profile organization that develops and promotes specific reform proposals. Another is the *Citizens' Coalition for Education*, an offshoot of the Citizens' Council (above) that was formed in 2010 to document the harmful activities of SNTE and press the government for change. These initiatives should be seen as steps toward developing an effective demand for quality education, and building a constituency that might make it easier for political leaders to confront SNTE and other special interests.

Much more needs to be done, however. Although there is no single recipe for successful education reform, the following policies will have a substantial, positive impact:

1. **Make learning for all a long-term national objective.** The goal is to shift the traditional focus of education policy away from inputs and toward outputs and processes. Emphasis should be on monitoring education outcomes—principally learning—and taking the steps necessary to raise learning to acceptable competency levels. An important part of making learning for all a long-term national objective is establishing a culture in which education quality receives top national priority. Major priority should also be given to raising learning among the poor. Leaders from the public and private sectors should to join in high-profile campaigns that draw attention to education objectives, debate their merits, and celebrate progress in achieving them. Success should be measured by how much students learn rather than by spending or enrollments.

A key component should be to make education a long-term state policy (*política de Estado*) at both the federal and state levels that is insulated from partisan politics and based on multi-party agreements that endure relatively unchanged from one administration to the next. Specifically, the government should:

- *Establish a set of demanding core standards in reading, math and science for each grade, and key them to existing testing systems.* It should also maintain a robust and professional student assessment program, and

44 Raphael, Ricardo. 2007. *Los Socios de Elba Esther*. México: Planeta.

45 Juárez Gonzalez, Leticia. 2011. *Insatisfacción*. Nexos, May.

make the results widely available, especially to parents.⁴⁶

- *Establish clear expectations for what teachers should know and do in the classroom.* Mexico should define what it means by effective teaching, outlining out the kinds of skills, strategies and methods it expects of its teachers. It should integrate these expectations into teacher training, make them core objectives for principal and supervisory personnel, and incorporate them into a new teacher evaluation system.⁴⁷
- *Recruit only the most talented graduates into the teaching profession.* Entry into teacher training programs should be highly selective, with full-stipend scholarships for high-scoring applicants. The practice of inheriting or purchasing teaching posts should be eliminated. Teachers' salaries should be competitive, and be based strongly on quality of performance and other relevant indicators rather than on level of education and years of service. Salaries should vary with subject taught, geographic location, and student population. Lifetime job tenure either be eliminated, or limited to a few highly successful teachers after substantial time in service.⁴⁸
- *Restructure teacher training* by setting high standards for training institutions, emphasizing subject matter knowledge over theory, and adding a strong component of practical experience. High-prestige alternative training programs should be established that allow top performing college graduates who did not specialize in education to qualify for teaching positions. Universities should have the same ability to train teachers for public schools as do public *Normales*. Hiring procedures should not favor graduates of any particular kind of institution.⁴⁹
- *Transform the role of principal and supervisory personnel from administrator to pedagogical leader.* Principals, supervisors and technical pedagogic assistants (ATPs) should become instructional leaders, or coaches, who regularly assess performance, demonstrate proper techniques and make sure their teachers become effective instructors. This implies a major effort to select principals and supervisory staff on the basis of merit, and provide them with proper skills, and streamlining administrative procedures so that principals can focus on teacher mentoring and evaluation. SNTE should be

46 According to a 2007 McKinsey report "All the top-performing and rapidly improving systems have curriculum standards which set clear and high expectations for what students can achieve." Finland and Singapore are among those cited. Regarding student assessments, the McKinsey analysis also observes that "All the top-performing systems recognize that they cannot improve what they do not measure." (Barber and Mourshed, 2007: 35). By way of example, in 2006 the Brazilian state of Minas Gerais set a recommended reading standard for 8-year-olds and managed to increase the percentage reading at that level from 46 to 85 percent by 2010. (Mourshed and others, 2009)

47 McKinsey & Company's review of the world's best-performing school systems concluded that "The first part of the challenge is to define what great instruction looks like." (Barber and Mourshed, 2007: 26). In less developed countries, these include scripted teaching materials (Minas Gerais in Brazil and Mahdya Pradesh in India); more advanced countries rely on a carefully developed framework that outlines what a teacher should know and do in the classroom. (Mourshed and others, 2009)

48 By way of example, South Korea recruits its teachers from the top 5 percent of each graduating cohort; Finland does so from the top 10 percent; and Singapore and Hong Kong do so from the top 30 percent. Singapore, China, Minas Gerais, Chile and Western Cape (South Africa) offer some form of salary bonuses based on improvement of students' performance; Top-performing systems generally offer a starting salary that is just below GDP per capita. (Barber and Mourshed, 2007). Funding is generally tied to performance in some way: "...system leaders were quick to note that salaries were only increased once the system had made significant progress in achieving the goals of that stage's intervention cluster." (Mourshed and others, 2009: 61)

49 Very few successful education systems restrict training to Normales. Teachers in virtually all of the world's high performing school systems have university degrees. Some countries have created alternative training paths—in England, by 2006, there were 32 different ways to enter the teaching profession, and all had the same expectations and knowledge once having completed their training. (Barber and Mourshed, 2007)

prohibited from participating in any supervisory function.⁵⁰

- *Make accountability a central feature of public education.* A strong teacher evaluation system should be established based in part on the teacher expectations framework and in part on student learning over the school year. Effective teachers should be rewarded with higher salaries. Non-effective teachers who fail to improve should be dismissed. The government should experiment with alternative models of service delivery that operate under clear expectations, meaningful consequences for performance, and significant competition among providers. Examples include charter schools, vouchers, school-based management reforms, and public-private partnerships.⁵¹

2. Reduce the power of the teachers union (SNTE).

The 1946 decree that gave SNTE exclusive rights to represent teachers should be reviewed, repealed and replaced. Teachers should be allowed to join the union of their choice, or not to join at all. Teachers unions should be restricted to collective bargaining

on salaries and other strictly labor issues, not allowed to participate in decisions on hiring, evaluation, teacher assignment, or teacher supervision. SNTE's veto over education policy should be eliminated. This recommendation will be difficult to implement and requires substantial political will. Nonetheless, without changes to the laws and changes giving SNTE a co-governing role in education, it will be hard for any government to make significant progress.

3. Enhance the role of universities as a source of technical training and research, in cooperation with the productive/private sector, by:

- Expanding funding for research and development through venture funds, business-university funds, basic research funds, and incentives for R&D companies.⁵²
- Establishing a rigorous higher education accreditation body with proper funding and autonomy.
- Shifting public spending on higher education away from direct support for institutions and towards scholarships and living stipends for poor but talented students.

50 High-performing systems as diverse as Ontario, Canada, Finland and Singapore have made developing strong school leadership a key part of their reform strategies. Systems in Boston and Chicago have seen rapid improvement in student performance by having coaches work one-on-one with teachers in classrooms; Singapore selects master and senior teachers to develop teachers and lead coaching, and has a strict selection process and high starting salaries when hiring principals. (Barber and Mourshed, 2007).

51 While accountability mechanisms vary substantially, they are always present in successful school systems, such as Finland ("Accountability in the Finnish system is built from the bottom up"—OECD 2011: 127). The McKinsey 2007 document concludes "Most top-performing systems recognize that no selection process is perfect, and so implement procedures to ensure that the lowest-performing teachers can, if necessary, be removed from the classroom...based on the evidence of their classroom practice." (Barber and Mourshed, 2007: 20), Singapore and China award salary bonuses based on teacher performance. Hong Kong's school system, since 1960, is largely publicly funded and privately operated.

52 The Chinese government has launched a group of specific national initiatives to develop a number of world-class research universities—Chinese Ivy League—such as Shanghai Jiao Tong University (SJTU). Part of the initiative is to provide financial investment from both the central government and the local government. The business community has made important financial contributions to help increase the endowment of top institutions in Singapore and Hong Kong, China (Altbach and Salmi, editors, 2011).