



Toward a National Framework of Lifelong Learning in Mexico

Consuelo Ricart
Tzitzí Morán
Christina Kappaz



Toward a National Framework of Lifelong Learning in Mexico

**Labor Markets and Social
Security Unit (SCL/LMK)**

Consuelo Ricart

Tzitzí Morán

Christina Kappaz

Inter-American Development Bank

**Cataloging-in-Publication data provided by the
Inter-American Development Bank
Felipe Herrera Library**

Toward a national framework of lifelong learning in Mexico / Consuelo Ricart, Tzitzí Morán, Christina Kappaz.

p. cm. — (IDB Monograph ; 217)
Includes bibliographic references.

1. Continuing education—Mexico. 2. Occupational training—Mexico. 3. Selection of employees—Mexico. I. Ricart, Consuelo. II. Morán Carreño, Tzitzí. III. Kappaz, Christina. IV. Inter-American Development Bank. Labor Markets Unit.
IDB-MG-217

JEL Classifications: E00, F00, H1, H5, H7, I2, J2, J4, J6, J8, L1, L2, L5, O1, O2, O4, O5, O11

Key words: Mexico, lifelong learning, productivity, technical education, active labor market policies, employment, labor market, productive sector, skills standards, apprenticeships, public-private partnerships.

The opinions expressed in this publication are those of the authors and do not necessarily reflect the views of the Inter-American Development Bank, its Board of Directors, or the countries they represent.

The unauthorized commercial use of Bank documents is prohibited and may be punishable under the Bank's policies and/or applicable laws.

Copyright © [2014] Inter-American Development Bank. All rights reserved; may be freely reproduced for any non-commercial purpose.

Table of contents

EXECUTIVE SUMMARY

I. LIFELONG LEARNING IN THE CONTEXT OF MEXICO'S ECONOMY

The Role of Lifelong Learning

Mexico's Economic Context

Core Dilemma: Low Productivity of the Workforce

II. PREPARING THE LABOR FORCE: MEXICO IN COMPARATIVE CONTEXT

Current Education and Skill Level of the Workforce

Investment in Education and Training

III. MEXICO'S CURRENT LIFELONG LEARNING SYSTEM

Overview of the System Today

Skill Standards Certification System: An Unfinished Symphony

Upper-Secondary and Vocational Education

Higher Education

Continual Skills Upgrading for Active Workers

Informing Lifelong Learning Choices with Labor Market Information

Coordination with the Productive Sector

IV. RECOMMENDATIONS

Guidance for Mexico from International Best Practices

VISION: Adopt a Strategic National Growth Vision and Productivity Strategy

A NATIONAL PROCESS: Involve Relevant Stakeholders in a Concerted National Effort

GOVERNANCE: Define a New Governance Mechanism for Workforce Development

GROWTH POLICIES: Align Education Policy to an Economic Growth Agenda

CAREER DEVELOPMENT WITH A LENS TO THE FUTURE: Expand Use of Labor Market Information and Career Guidance

INCENTIVES: Put in Place the Right Mix of Incentives to Encourage Training and Continuous Learning

RESULTS-ORIENTED APPROACH: Develop and Use Outcome Indicators to Assess Progress

V. CLOSING REMARKS

ANNEX 1. COUNTRY COMPARISON - MAIN ECONOMIC AND SKILLS DEVELOPMENT INDICATORS

REFERENCES

Glossary

BÉCATE.	Program of stipends for on-the-job training for jobseekers (former PROBECAT)
CCF.	Common Curriculum Framework
CEDEFOP.	European Center for the Development of Vocational Training
CII.	Confederation of Indian Industry
CIMO.	Training Program for Active Workers (Capacitación Industrial de la Mano de Obra/Programa de Calidad Integral y Modernización)
COEPES.	State Commissions for Higher Education Planning
CONACyT.	National Council of Science and Technology
CONALEP.	National College for Technical Professional Education
CONOCER.	National Skills Standards Board
CORPES.	Regional Councils for Higher Education Planning
COSDAC.	Sectoral Council for Academic Planning (curricula updating at the upper-secondary education level)
ENLACE.	National Assessment of Academic Performance of Educational Centers
ENILEMS.	National Survey of Labor Insertion of Upper Secondary Graduates
ENOE.	National Occupation and Employment Survey

PIAAC.	Program for the International Assessment of Adult Competencies
PISA.	Program for International Student Assessment
P-TECH.	Pathways in Technology
PROBECAT.	Program of stipends for on-the-job training for jobseekers
RIEMS.	Upper- Secondary Education Integral Reform
R&D.	Research and Development
SEDESOL.	Ministry of Social Development
SEMS.	Upper Secondary Education Undersecretariat
SEP.	Ministry of Education
SHCP.	Ministry of Finance
SNB.	National Baccalaureate System
SPRING.	Singapore's Productivity and Standards Board
STEM.	Science, Technology, Engineering, and Mathematics
STPS.	Ministry of Labor and Social Protection
US.	United States of America
VET.	Vocational Education and Training
WB.	World Bank
WEF.	World Economic Forum

Executive Summary

Introduction

This paper seeks to provide insight into the opportunities and challenges ahead for Mexico to consolidate a lifelong learning policy framework, building on the progress and avant garde approach adopted by the country with regard to forging a competency-based education model -a model that already encompasses job skills, academic competencies, and employability skills.

A lifelong learning framework, which encourages learning throughout the lifecycle, helps ensure that workers gain the right set of skills before entering the workforce and that they continually update their skills to meet changing market demands and maintain or increase productivity.

From the early 90s, Mexico has led a transformational upgrading of the skills of its workforce driven by major innovations in its education and workforce training systems. Over the past 20 years, it has made important advances, the results are considered remarkable by developing country standards. They include: a significant increase in the years of education of its population; the extension of compulsory education to the upper-secondary level; the adoption of a national skills standards system and competency-based curriculums; the introduction of regional higher education institutions that can adapt to the needs of local industry; and the provision of financial incentives and technical assistance to promote investment in training for employed workers and jobseekers.

Given its previous investments, Mexico is one of the few countries in the Latin American region that has laid the ground work from which to now complete its advances into a cohesive lifelong learning framework. A policy agenda to construct a lifelong learning framework is even more ambitious than what Mexico has achieved over the last decades. A lifelong learning agenda aims to build a coherent skills development national framework to improve the productivity of the Mexican workforce and the competitiveness of the economy. This is particularly important for Mexico, which is the 14th largest economy in the world and produces 60% of all exports out of Latin America.

The need to make the “leap” into a lifelong learning system that truly supports productivity growth could not be more imperative for Mexico. Policy makers warn of a range of obstacles that must be overcome, dragged down by a slowdown in GDP and productivity. Only a small percentage of Mexico’s GDP is concentrated in very high-productivity enterprises, the majority of workers have very low levels of productivity (average annual growth was only 0.55% between 2005 and 2012), which undermines any attempt to improve the country’s competitiveness. Mexico is ranked 53rd out of 144 countries by the World Economic Forum’s Competitiveness Index. Moreover, there is a mismatch between worker skills and the needs of the productive sector, which also influences growth through adverse effects on labor productivity. Almost half of Mexican employers report difficulty in filling vacancies because of the lack of candidates with the right skills for the job.

Aware of these serious constraints to future performance, the Mexican government has made productivity a center-piece of its development strategy. Lifelong learning is a critical element of this policy thrust. A challenge ahead is how to propel forward the institutional and policy changes needed to achieve its lifelong learning aspirations; to explore how to leverage public investments in education, training, and active labor market strategies to support state, regional, and national economic and workforce development goals towards sustainable productivity growth.

Education and Skills of the Mexican Labor Force

Mexico has made improvements over the last two decades in the education level of its population, but is still behind the other member countries of the Organisation for Economic Co-operation and Development (OECD). The Mexican workforce has an average of 8.8 years of schooling, as compared to the OECD average of 11.9. Only 36% of the working population in Mexico (ages 25–64), and only 44% of Mexicans ages 25–34, has attained at least a secondary education, as compared to the OECD averages of 74% and 82%, respectively. Only 17% of the Mexican workforce has a tertiary education, as compared with the OECD average of 31%. Once they get into the workforce, less than 40% of Mexican workers receive training while employed.

Mexico invests about the same percentage of its GDP on education as other OECD countries, but this translates into considerably less investment per student, given the size of the population. Mexico invests most of its education resources on teacher salaries, yet has the highest student-to-teacher ratios in the OECD. Two key reforms are beginning to move forward the overall quality of education: a comprehensive reform that was introduced in 2008 and a more specific reform that seeks to deepen the professionalization of teachers, introduced in 2013. All recognize that the country still needs to accelerate the rate of implementation of those reforms and take the next steps so that these changes register concrete advances in educational performance. While the performance of Mexican students in the international student assessment (PISA) has steadily improved since 2000, it is still far below the OECD average, that is, Mexico must advance faster and lead in leaps and bounds to compete with its workforce to international standards.

As for workers already in the workforce, only one-third of Mexicans have received some kind of training in their working lives. This means that, after leaving formal education, individuals do not have access to new learning opportunities, ultimately negatively affecting innovation and firm

productivity -as lifelong learning is very limited in Mexico outside formal education, which many do not complete. As a middle income country which is shifting its focus to high value added activities like aerospace and biotechnology, the need for lifelong learning opportunities available to workers is increasingly critical. High-value added industries like those will boost the demand for constant improvement of training strategies for active workers. This immediate pressure might represent a window of opportunity -compelling Mexico to face the need to continue endeavoring to develop integrated pathways of skills for sustained growth and further job creation.

Review of Mexico's Current Lifelong Learning System

Mexico is a large country with an array of programs that contribute to a lifelong learning system spread across many institutions. The government is working to modernize its education and training system to facilitate continual skills upgrading and to strengthen its relevance to the productive sector. However, past initiatives have lacked the strategic focus to engage industry in collective efforts as a key partner to promote worker and firm productivity and ultimately improve overall competitiveness. A central focus of productivity-improvement efforts needs to be reversing this unwelcome trend and capitalizing on best practices that have already shown the potential to flourish.

... From a Skills Standards and Certification System...

At the heart of a lifelong learning framework are the core competencies that define what people should learn. The Mexican skills standards and certification system, initiated in the mid-1990s, was intended to provide a unifying framework for those competencies. However, the system has run into difficulties. The National Skills Board, CONOCER, has gone through various reforms and has not assumed a position of leadership or relevance for the productive sector. Industry leaders have chosen to create their own standards or use international standards rather than CONOCER standards. Since 2007, only 35% of existing CONOCER standards have been used for productive purposes, which raises questions about the viability of the institution.

The overarching challenge for CONOCER's future is the fact that most of the efforts to restructure the organization have not been fruitful. There may therefore be a need to re-evaluate the value of CONOCER as a key regulating entity and shift toward a policy that seeks to consolidate a broader skills development system that incorporates all of the different actors that intervene in the efforts to align overall human resource development initiatives.

... The Upper-Secondary and Vocational System...

Upper-secondary education, which became compulsory in Mexico in 2012, covers three years of study beyond the nine years of basic education, and includes general and vocational education as well as training for work.

Most upper-secondary students (60%) are enrolled in general baccalaureate schools, while 32% attend one of the government's sector-specific technical schools (agriculture, industrial tech-

nology, or oceanography), and 8% attend the semi-autonomous technical professional education schools (CONALEP). The latter has been increasing its connections to the productive sector and introducing innovative programs such as technical pathways (*Trayectos Técnicos*) designed jointly with local businesses.

Training for work is carried out at publicly subsidized job training centers. In the same way that CONOCER has lacked the strategic capacity required to become a relevant player in forging industry growth, the public training system has tended not to have the capability and responsiveness to meet the changing industry and individual needs. This has generally prevented them from being perceived by industry as actual partners to leverage resources, technology transfer, and innovation.

Mexico has made important strides in aligning its upper-secondary education system to the needs of the productive sector and in improving quality. A competency-based model has been in place since the development of the skills standards system, and this process was reinforced with enactment of the 2007 Upper Secondary Education Reform (RIEMS). RIEMS consolidated a national baccalaureate system with a common curriculum and is working with industry to refine the basic and extended technical and professional competencies that will be required by the labor market.

RIEMS is making significant headway, but is still in progress. The initiatives to strengthen linkages to the productive sector offer great potential but still represent isolated efforts. Part of that is transforming the way schools teach in order to better prepare students with the type of learning and problem solving skills that are required for the world of work. Exposing both students and teachers to the workplace is important part to this effort.

... Higher Education...

The Mexican higher education sector is well developed, with institutions operating in almost every state and with several high-quality universities conducting research. Beginning in the 1990s, the government introduced new institutions (namely, State Technological Institutes, Technological Universities, and Polytechnic Universities) that are intended to better cater to local labor market needs and provide businesses with better access to training and technical assistance.

The system is on a positive trajectory of increasing its coverage and enhancing its linkages to the productive sector, but more work is needed. The participation of adult learners is still limited within the tertiary system. The proportion of tertiary institutions that provide services to industry is small relative to the more traditional public universities that do not offer this type of fee-based technical assistance and research services. The challenges are both to incorporate a wider range of return students into higher education while simultaneously helping align higher education, particularly in key employment demand areas, to curriculum, methods and work-based models based on productive sector growth. Even though Mexico has increased its public expenditures on tertiary education, the country still spends less per student than other OECD countries. Fostering greater dynamism through strategic investment in knowledge sharing, research, and innovation, particularly in the private sector, is a challenge for Mexico.

... Continual Skills Upgrading for Active Workers...

In Mexico, the training of active workers occurs primarily through the public job training centers, technical upper-secondary, and tertiary education institutions. These public systems, combined with a concerted effort to increase work-based learning opportunities, could make a difference in the overall skill levels of active workers, but they need to reorient their focus to make business more of a primary customer and forge ahead with clear priorities and targeted strategies aligned to a specific growth strategy.

The main programs for the training of workers are: (i) a program of stipends for on-the-job training to jobseekers, offered by the Ministry of Labor through its local employment offices (originally known as PROBECAT and operating today as Bécate), and (ii) a program aimed at enhancing in-firm training for the employed workforce, originally called CIMO and later PAC/PAP, which co-financed technical assistance and training to improve overall performance of workers and the firms themselves. Despite the success of both programs, Bécate lacks coverage and CIMO/PAC/PAP lost momentum, funding, and consequently its weight in the government's agenda. For these programs to contribute effectively to the productivity agenda, they have to expand significantly in scope.

... Informing Lifelong Learning Choices with Labor Market Information...

Lifelong learning by its very title implies that decisions are made for education, short-term training, skills certification, work-based learning, taking into account both individuals' own preferences/skills for careers and knowledge about where future jobs are (e.g. salary trends, location). As youth face the task of making career choices and workers seek to upgrade their skills and ensure that they acquire the skills demanded by the productive sector, access to reliable labor market information is critical. Mexico has the region's leading labor market information service in its Labor Observatory. The Observatory provides a snapshot of how the labor market is currently behaving, links jobseekers to a range of job openings and organizes information along career paths to assist current and future jobseekers in making decisions about the progression of their careers. The next step for the Labor Observatory is to make it a bona fide observatory of the future. Its support to learners could be enhanced in the future if it also provided information on future trends, skill shortages, and gaps. More could be done to link the Observatory to secondary and tertiary schools and encourage greater use among employers, students and workers of the tools it provides. This range of complements would more fully utilize the Observatory as a principal tool of a lifelong learning system.

... To the Coordination with the Productive Sector

The essential ingredient to ensure relevance and adaptability of the lifelong learning framework is the collaboration between the productive sector and the education and training sector. Mexico has made important strides in public-private partnerships to ensure that skills development matches the needs of employers. More needs to be done to consolidate and deepen these partnerships on all fronts. Public resources need to be channeled to leverage and sustain employer involvement and provide strategic direction based on clear sector or regional economic goals. A critical part of

a successful strategy is to establish national and state development goals that can contribute to increasing productivity levels in coming years.

An example worth highlighting, which piloted a systemic human capital development approach that brought business representatives, training providers, and policy makers to the table, took place in the region known as the Riviera Maya, where Mexico has attracted considerable investment in the tourism sector but where high job rotation and poor initial skills were not sustaining the labor force needed to support this investment. These public-private collaboration schemes are reorienting traditional vocational education and training towards tourism sector needs, providing workplace-based learning in hotels, and linking the sector better to the employment service offices. The Riviera Maya model has been identified as one of the most significant efforts in Mexico to make the education and training systems more responsive to the industry's needs, specifically regarding prioritized sectors with growth opportunities, such as the hospitality sector, which represents 9% of GDP, is the third source of income, and creates 2.5 million jobs per year.

Recommendations

There is little debate amongst local analysts over the new direction needed in Mexico towards lifelong learning as a central feature of a more productive and more prosperous country. How to create such systems from the existent institutional bases requires some big picture thinking and big picture changes. It is well recognized that countries that adopt skills development strategies that are aligned to an economic growth strategy, design education and training programs in partnership with the productive sector, and offer workplace learning opportunities tend to have a more productive workforce and more developed economies. Best practices internationally demonstrate the potential of skills as a driving force for development. They also demonstrate, in a compelling way, that it is possible to become a knowledge economy in less than a generation by crafting a human capital strategy to fulfill future-based economic goals.

What can Mexico learn from international success stories? It is not a matter of replicating models, but rather, of adapting elements of success according to Mexico's needs and capabilities. Considering the current context, we recommend that Mexico consider pursuing the following areas of action, which are based on the experiences of countries that are doing the best in terms of both preparing youth to enter the workforce and facilitating lifelong learning for their active workforce. This paper focuses on eight key recommendations.

1 VISION: Adopt a Strategic National Growth Vision and Productivity Strategy.

A long-term vision for Mexico's economic future can guide the country's human resources development strategy and build commitments to lifelong learning and the specific education and training policies needed to position lifelong learning to the country's economic development, growth, and productivity. Focusing this strategy on priority sectors as part of a medium- or long-term economic plan, with linked education and labor policies, would allow the country to follow clear development pathways, as efforts would focus on those areas that are able to spur more dynamism, innovation, and sophisticated value chains, and where investment will make the greatest impact.

A highly skilled and adaptable workforce where skills are used effectively to meet the increasingly complex needs of the industry is clearly a pathway to accelerating Mexico's growth potential.

2 A NATIONAL PROCESS: Involve Relevant Stakeholders in a Concerted National Effort.

In knowledge economies, characterized by rapid change and innovation, stakeholders are mutually interdependent and must hold each other accountable for delivering their part of the strategy. Ongoing interaction between partners is also important in that it promotes continuous knowledge sharing, which is often the source of local innovation and can lead to a virtuous cycle of development.

Coordination among all social actors should support specific collaborative efforts such as: (i) the promotion of a sector-based and industry-led approach to skills development; (ii) public-private partnerships, including joint delivery of training and workplace learning opportunities; (iii) development of joint industry and skills forecasting mechanisms, as a basis for priority setting and constantly aligning initiatives to meet strategic goals; and (iv) job rotation of leaders from all government, productive sector, education, and labor unions across institutions involved in the system.

Building these sorts of alliances is not without challenges. Care needs to be taken in designing and promoting the type of partnerships that can effectively expand lifelong learning opportunities. They require trust and their benefits tend to materialize in the long-term. Furthermore, prospective partners each have different missions and priorities, and therefore all stakeholders need to be clear from the start about their common goal and distinct individual expectations on what each wants to gain from the collaboration.

3 GOVERNANCE: Define a New Governance Mechanism for Workforce Development.

Following successful examples in many countries, Mexico could designate and finance a national institution with a mandate to inform economic, labor, and education policy. Such an agency should bring relevant stakeholders to the table, including key employers and unions, business and skill development experts, researchers, and government representatives. It should also have the resources to conduct research and the political weight to inform policy, centered around avoiding skill shortages, improving productivity and enhancing labor market participation. It could follow the rationale of a consortia, responsible for conducting in-depth analyses of specialized occupations to advise whether skill supply is adequate and where other incentives to stimulate the supply and demand for skills, may be required. It could similarly be responsible for devising and promoting industry strategies to underpin workforce initiatives.

4 GROWTH POLICIES: Align Education and Training Policy to an Economic Growth Agenda.

The education and training system should ensure that contents remain relevant to market needs and that a sufficient supply of skilled workers is available for the economy, focusing on prioritizing

human resource development initiatives where there is most economic and social development potential. Mexico's reform path needs to continue to consider the following: (i) increasing the interest among youth in technical pathways; (ii) linking curriculum to key industry needs; (iii) connecting youth to the workplace; (iv) actively engaging employers in program planning and implementation; and (v) supporting professional development of teachers and collaborative exchange between schools.

5 FORWARD THINKING SKILLS STANDARDS: Rethink the Existing Skills Standards System.

The skills standards system was initially limited to technical/job skills, and although efforts are underway to create a more comprehensive qualifications framework that includes core, academic, and technical competencies, these efforts are still far from reflecting the requirements of the productive sector. There is a need to understand how to capture the learning that occurs in diverse environments and how to actively engage the productive sector in skills development planning and decision making. The country should also re-evaluate the value of a skills standards certification system for workforce development purposes, as well as the value of CONOCER as a key regulating entity of the system. It is critical for Mexico to embrace a broader skills development system that focuses on the sectors of strategic importance for the economy or those where growth is anticipated and there is more potential to promote a knowledge-based economy.

6 CAREER DEVELOPMENT WITH LENS TO THE FUTURE: Expand Use of Labor Market Information and Career Guidance.

The quality and currency of career information and professional advice are a vital piece of an efficient lifelong learning system which drives growth. Mexico has a good labor market Observatory, but needs to enhance its use and forecasting capabilities to provide labor market intelligence to employers, jobseekers, and educators. Furthermore, the importance of professional guidance in all educational subsystems should not be underestimated.

7 INCENTIVES: Put in Place the Right Mix of Incentives to Encourage Training and Continuous Learning.

The vast majority of firms in Mexico are small and medium sized enterprises, which have little opportunity to invest in training, and have a short-planning horizon. The public sector training system, which should fill this gap and train active workers from the country's small and medium sized firms, remains supply-oriented, despite efforts to shift to a demand-driven system. In any case, workforce development occurs most naturally within the enterprise. Although government influence might be limited within this environment, there is room for the public sector to be a partner in cofinancing work based training initiatives.

Both employers and workers need incentives to pursue continual upgrading of skills in order to become active contributors of a knowledge-based economy and engage in technology transfer. The Mexican government should expand its financing of active labor market programs (currently just 0.01% of GDP as compared to the OECD average of 0.66%). This funding should be directed to an

expansion of Bécate and the redesign of a sound training program that works in sync with employers to upgrade active workers' skills so that they can better contribute to the overall performance of firms. The implementation of pilots in specific regions or sectors and with the characteristics that led to the earlier success of the CIMO program might orient a new training policy for Mexico.

8 RESULTS-ORIENTED APPROACH: Develop and Use Outcome Indicators to Assess Progress.

To facilitate work toward achieving a vision for the future, a system has to be in place to measure and monitor the evolution from where the country is today. The use of the international PISA test and the Mexican ENLACE assessment already help to track student academic achievement. But little is known about the skills and competencies of the workforce in key industries and sectors. There has been a lot of progress internationally in the development of instruments that offer insights not only into skill proficiency of the workforce, but also into the application of knowledge and know-how at work. Mexico could analyze the possibility of adopting or developing an assessment instrument under a similar scheme.



Chapter I

LIFELONG LEARNING IN THE CONTEXT OF MEXICO'S ECONOMY

"Skills have become the global currency of the 21st century. Without proper investment in skills, people languish on the margins of society, technological progress does not translate into economic growth, and countries can no longer compete in an increasingly knowledge-based global society."

OECD, "Better Skills, Better Jobs, Better Lives," 2012

The Role of Lifelong Learning

Learning does not stop when we finish school, but is something we engage in throughout our lives. As technology and knowledge evolve ever more quickly, workers at all levels need to ensure that they learn the right set of skills as they enter the job market and that they continue to learn throughout their careers. Absent continual learning, workers cannot keep up with the demands of the workplace.

Workers need to learn the right skills when starting out in the job market and need to continue learning and updating their skills throughout their lives.

Even where unemployment is high, employers can find vacancies difficult to fill because workers do not have the required skills. In today's global competitive economic landscape, the skill set of the workforce needs to be continually updated and flexible to meet the rapidly changing demands of the knowledge economy.¹ Skills upgrading can increase the relevance of individual workers in the labor market and contribute to productivity gains and growth within the productive sector (OECD, 1994, 2001; Hanushek and Woessman, 2007, 2008; Almeida et al., 2012).

¹ For an overview of the discussion on the importance of new skills sets to match the changing needs of the knowledge economy and references to relevant research, see OECD, 2012a, and World Bank, 2012.

A lifelong learning framework² helps meet this need for better skills matching by breaking away from traditional age-bound schedules for education and training and instead encouraging learning throughout the lifecycle, from early childhood through retirement. Lifelong learning “encompasses formal learning (schools, adult education, literacy programs, training institutions, universities); non-formal learning (on-the-job training and work-based learning); and informal learning (learning that happens anywhere, such as skills learned from family members or people in the community). Lifelong learning allows people to access learning opportunities as they need them rather than because they have reached a certain age.” (World Bank, 2003). Expanding learning to different environments has gained importance, and nonformal education has become increasingly sophisticated and the cornerstone of the economic success stories of countries like Korea and Germany. If upon conclusion of formal education -which many do not complete - individuals do not have access to new learning opportunities, then ultimately, innovation and productivity will be negatively affected.

Mexico, like many other countries, is seeking to improve the system that prepares its labor force for the world of work and to facilitate learning for workers throughout their careers. Over the last 20 years, Mexico has made important advances in this arena, including, among others, a significant increase in the years of education of its population; the extension of compulsory education to the upper-secondary level; the adoption of a national skills standards system and competency-based curriculums; the introduction of regional higher education institutions that can adapt to the needs of local industry; and the provision of financial incentives and technical assistance to promote investment in training for employed workers and jobseekers.

On the private sector side, Mexican companies that have to compete globally are increasingly aware that creating a strong knowledge base within their factories is the key to innovation and worker productivity and the comparative advantage needed when competing against lower-wage countries.³

Although more work is needed, Mexico has created a platform from which to build a cohesive lifelong learning framework that works in tandem with the productive sector. The current administration, which took office in December 2012, has identified the promotion of productivity as a cross-cutting strategy and defined lifelong learning as one of its priorities under the axis of “Mexico with Quality Education” (National Development Plan 2013-2018). The challenge is to operationalize this aspiration and to explore how to leverage public investments in education, training,

² For the purposes of this paper, the lifelong learning framework is a set of principles or long-term goals that form the basis for making rules and guidelines in order to give overall direction to planning and development of a system that allows people to access the diverse learning opportunities throughout their lifecycle. The lifelong learning system involves the set of institutions and other informal learning environments that will create a basis for improving the quality, accessibility, linkages, and public or labor market achievement and recognition of learning in a continuum, within a country and internationally. This includes the means of developing and operationalizing policy on skills development, along with institutional arrangements, quality assurance processes, and assessment and awarding processes, among others. For more detail on the overall conceptualization of lifelong learning, see World Bank, 2003; Behringer y Coles, 2003; Álvarez-Mendiola, 2006.

³ The company Plantronics is an example of this mindset at work in Mexico: The company provides ample opportunity for staff learning and professional growth, while always paying close attention to creating an environment within the factory for reflection and problem-solving to flourish.

and active labor market strategies that promote on-the-job training and work-based learning to support state, regional, and national economic and workforce development goals.

Mexico's Economic Context

Mexico is the second largest economy in Latin America and the Caribbean (LAC) and the 14th largest in the world, with a population of close to 115 million people and a Gross Domestic Product (GDP) of US\$1.153 trillion (World Bank, 2013b). Mexico's export-oriented economy accounts for 60% of all exports coming out of LAC. The country's foreign reserves are at historic highs, the fiscal deficit is low, and inflation is under control, estimated to average about 3.5% for the next four years (SHCP, 2013).

Mexico is the 14th largest economy in the world and a member of the OECD. However, its GDP growth has slowed and it is behind in competitiveness, ranked 53rd out of 144 countries.

The drivers of Mexico's economy were put in place in the mid-1980s, when Mexico began to pursue an aggressive free trade agenda and export-based growth. These policies led to enactment of the North American Free Trade Agreement (NAFTA) and the admission of Mexico into the Organisation for Economic Co-operation and Development (OECD) in 1994. Participation in the OECD facilitated Mexico's efforts to institutionalize its fiscal discipline and to adapt emerging best practices from developed countries related to labor market policies.

Despite these strong underpinnings, the Mexican economy faces structural challenges that have dampened its economic growth and competitiveness. The World Economic Forum's Global Competitiveness Index for 2013-2014 ranked Mexico 55th out of 148 countries, placing it behind China (29th), Chile (34th), and Costa Rica (54th) (WEF, 2013). Mexico's ranking in the index is pulled down by its poor-quality educational system (119th) and its low score in labor market efficiency (113th) (WEF, 2012).

Low productivity levels - which have not seen gains over the last 30 years, despite increases in education of the workforce - contribute to Mexico's poor competitiveness.



Research has found that the key issue affecting the competitiveness of Mexico, as well as other LAC countries, is not the low accumulation of growth factors, but instead the low level of productivity, with LAC overall considered to be producing at half of its potential (IDB, 2010). Mexico lost almost 40% of its total factor productivity in comparison with the United States between 1960 and 2005 (Pagés, 2010). Estimates made by the United Nations Industrial Development Organization suggest that labor productivity levels in Mexico, as a proportion of the United States standards, decreased over the past 40 years from 42.1% in 1961 to only 32.7%

in 2000⁴ (Hernández Laos, 2005). In comparison, Asian labor productivity increased from 15% to 54% as compared with the United States over a similar period from 1950 to 1998 (Jankowska et al., 2012). Even though labor productivity in Mexico has increased from 2005 onward, the average annual growth rate has been only a modest 0.55% (2005-2012). This means that four Mexican workers are still needed to perform what one American could do. Similarly, two Mexicans could produce what one South Korean does and five Mexicans produce the work of one Irish (CIDAC, 2011).

It should be noted that low productivity level is not uniform across Mexican companies. Some Mexican firms are very competitive and have learned to differentiate themselves in the local and international markets. This reflects the dualistic nature of the Mexican economy. There is a modern Mexico, a high-speed, sophisticated economy with cutting-edge auto and aerospace factories and corporations that compete in global markets. And there is a traditional Mexico, with low-speed, unsophisticated technologically and unproductive enterprises, many of which operate outside the formal economy (Bolio et al., 2014). It is precisely the deep division between the two economies that has kept Mexico's growth at disappointingly low levels despite three decades of economic reforms.

The fact that Mexico has not seen gains in productivity levels over the last several decades has in turn caused a drag on the overall growth of GDP and on growth of the country's income per capita. Mexico's GDP grew at an average of 2.3% per year between 2000 and 2012 (INEGI, 2014), which was below the LAC regional average for the same period (IDB, 2012c). Because of the global recession, Mexico's GDP growth rate was just below 4% during each of the last four years, and the growth rate for 2014 is projected to be 3.7% (OECD, 2014). Income per capita increased at an average rate of only 1.92% from 1960 to 2009 (IDB, 2012c).

Productivity has not improved in Mexico even with improvements in the average number of years of schooling of the Mexican workforce, which went from 6.6 years in 1991 to 8.2 years in 2004 and to 8.8 years in 2011 (OECD, 2012d). This reality in Mexico is inconsistent with the international research indicating a strong correlation between the skill level of the workforce and productivity at both the firm and country levels.⁵

While additional rigorous analysis is needed to understand this paradox, recent research by the Inter-American Development Bank (IDB) has identified the following as key factors contributing to stagnation of productivity in Mexico: (i) the prominence of the informal sector and of micro

⁴ It should be noted that there has been a dual path followed by Mexican labor productivity levels in relation to the United States, marked by significant increases in the first years of the period studied and a diminishing trend since 1981. Partial evidence demonstrates that this is also the case for manufacturing, which is the most successful Mexican sector in productivity terms. Previous estimates (Hernández Laos and Guzmán Chávez, 2004) show that, at least between 1975 and 1996, Mexican labor productivity levels in manufacturing remained relatively constant compared with the United States standards, presumably because they had not fully recovered yet from the severe crisis of the 1980s. Only a few manufacturing sectors in Mexico improved their comparative standards, including the basic metal industries, which, by the turn of the century, had exceeded the levels attained by the United States. For more detail, see Hernández Laos, 2005.

⁵ For a review of the research on the skills/productivity link, see Mason, 2008; Tamkin et al., 2004; Duryea and Pagés, 2002; Almeida et al., 2012; Hanushek, 2012; and OECD, 2012d.

and small businesses in the economy; (ii) labor market rigidity and policies that promote a low minimum wage and high tax on labor contracts, which have kept salaries low; (iii) the continued low level of educational attainment despite improvements, especially in comparison with Asian countries; (iv) the quality of education and the mismatch between the supply of skills and the actual demands of the productive sector; and (v) persistent monopolies that affect services costs (López Córdova, BID 2012).

Formal sector jobs have not kept pace with the growth in the Mexican labor force, which grew 26% since 2009, to about 50 million workers. Informality is pervasive, representing about 60% of all jobs.

The dominance of small companies in the Mexican economy plays an important role in the productivity dilemma, since research on productivity has identified company size as a major factor influencing firm-level productivity in LAC (Pagés, 2010). According to the 2010 economic census, microenterprises with up to 10 employees represent 95.3% of all Mexican business establishments and small enterprises with 11-50 employees represent 4.3% of establishments (INEGI, 2010). The share of micro and small enterprises has been growing. They employ 55% of the total workforce but contribute only 10% of the total value added in the Mexican economy in 2009 (INEGI, 2010). This is mainly attributable to a decreasing productivity, which fell by a staggering 6.5% a year from 1999 to 2009 (Bolio et al., 2014). All this undermines the strength developed by the modern sector of the economy and is reflected in an overall growth trajectory insufficient to lift the Mexican economy to competitive levels.

Small companies have a higher tendency to operate in the informal sector, but the prevalence of informality in the Mexican economy is perpetuated by a number of other factors as well, including the regulatory framework, low investment in innovation, institutional barriers to entrepreneurial competition, and limited access to finance (IDB, 2012a).

Informality has also been fueled by the fact that the modest level of GDP growth has not matched the rapid expansion of the Mexican labor force, which grew by 17% between 2005 and 2012, to a total of 50.6 million workers (ENOE, 2005, 2012). Unemployment is only about 5% in Mexico,⁶ but underemployment and job instability are prevalent, with many jobs outside the official benefits system. Informality is entrenched in the economy, with the percentage of jobs in the informal sector remaining at around 60% since 1995 (OECD, 2011).

The insufficient creation of quality jobs in Mexico is accompanied by the stagnation of wages. From 2002 to 2012, the average annual increase in real salaries was only 0.89% (IMSS and INEGI data 2002-2012). In 2012, almost 60% of workers in Mexico earned less than or up to three minimum salaries, equivalent to

There is a skills mismatch in Mexico; 43% of employers report lack of candidates with the right skills as the main difficulty in filling vacancies.

⁶ Labor market participation rates vary by gender. Over 90% of Mexican males, but only 50% of females ages 25-54, participate in the labor market (OECD, 2011).

about US\$15 per day. The experience-wage profiles of Mexican workers are flatter than those of their counterparts elsewhere. Evidence shows that the increase in wages associated with an additional year of work experience for men is 3.8% in Mexico, as compared to 5.8% in Colombia, 6.2% in Brazil, 8.1% in the United States, and 8.4% in Japan (Minowa, 2000).

Core Dilemma: Low Productivity of the Workforce

The limited creation of quality jobs and the persistence of low wages in Mexico are linked to the larger problem of the quality and productivity of the workforce. Mexico faces a dilemma as a middle-income country with a low skilled workforce. The increasing numbers of youth entering the workforce in Mexico do not have the skill sets needed by the productive sector. In a 2012 survey, 43% of Mexican employers reported lack of appropriate skills as a key factor in the difficulty in filling vacancies, well above the global average of 34% (Manpower, 2012). In contrast, 70% of education providers perceive that their graduates are adequately prepared for entry-level positions (Mourshed et al., 2012). This 30 percentage-point difference between what employers report and what education providers believe raises red flags. The disconnection between two of the main actors of the lifelong learning system indicates a lack of engagement on both parts. Employers do not necessarily communicate with schools, and schools still lack the right mechanisms to track their graduates' career path or the analytical capabilities to understand market trends and career paths. Most important, there seems to be a lack of alignment around economic goals for the country and a common vision for steering the lifelong learning system in the direction the country needs.

Employers tend to adapt to the skill level of the available workforce and thus have trouble attracting investors and higher-skill jobs (OECD, 2012). The deficiencies in the competitiveness of the labor force create a vicious cycle of low availability of, and low demand for, quality jobs. Efforts of policy makers charged with addressing this weakness to date have had limited effect on the country's ability to break out of this cycle (IDB, 2007) and have suffered from a lack of strategic direction that would align all these policies and instruments around certain priorities and sectors that together can jump-start the economy. For instance, the sophistication of activities within some industrial sectors, such as aerospace and biotechnology, will boost the demand for constant improvement of active workers training strategies.

Mexico must address these issues as part of a comprehensive strategy to improve productivity, with coordinated policies related to workforce development, economic growth, innovation, and a move toward greater formality of the economy. An important piece of that process is promoting a coordinated lifelong learning framework that can consolidate a learning ecosystem at all stages of life. The challenge is twofold: Workers already in the workforce need access to continuous and work-based learning to improve their skills and, at the same time, most

A cohesive lifelong learning framework is an important piece of a comprehensive growth strategy that addresses Mexico's productivity gaps.

new entrants to the workforce need to attain the skill sets required to impact labor productivity. Therefore, deliberately targeted workforce training and development practices delivered on a continuum are critical elements of an economic growth strategy for Mexico.

Aware of this challenge, the Mexican government has undertaken a series of bold structural reforms with the objective of fostering productivity, promoting growth and enhancing social development. The reform agenda of the current administration includes initiatives on competition, telecommunications, financial services, education, labor, energy, and fiscal issues—several of which are relevant to the necessary productivity-improvement efforts. These measures have not been evaluated in this report since they were being adopted or proposed during our research. However, for any reforms to have impact they will need to be translated into concrete action that provide the right incentives for companies to continue to invest in workforce development.

How well the rules are crafted, implemented, and enforced will determine whether Mexico can move beyond a two-speed economy that continues to fall short of expectations, and emerge as a single, more dynamic economy that is capable of realizing its growth potential (Bolio et al., 2014).





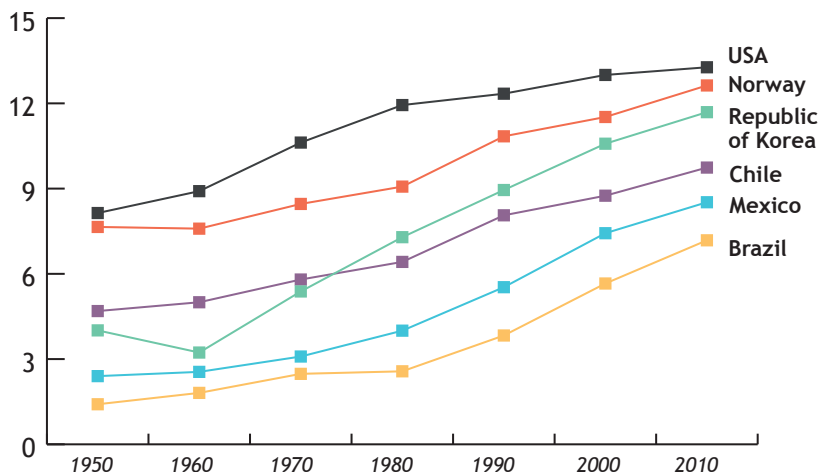
Chapter II

PREPARING THE LABOR FORCE: MEXICO IN COMPARATIVE CONTEXT

Current Education and Skill Level of the Workforce

Mexico has made improvements over the last two decades in the education level of its population. This trend in part changed the educational profile of the Mexican workforce. However, the lagged character of the educational system in the country is reflected in the small proportion of the population with middle- and high school education and professional studies. With an average of 8.8 years of schooling, the Mexican workforce is still far less educated than the workforce of other OECD countries and comparable Asian middle-income countries (OECD, 2012d). On average, the workforce in OECD countries has 11.9 years of schooling, and eight member countries have an average of 13 or more years of schooling (OECD, 2012d). At similar levels, Korea's workforce has an average of 11.69 years of schooling (Barro and Lee, 2013). The fact that Mexico did not increase the overall educational level or skills of its population at the same rate as other players with whom the country is competing contributed to its competitive disadvantage compared with other emergent economies.

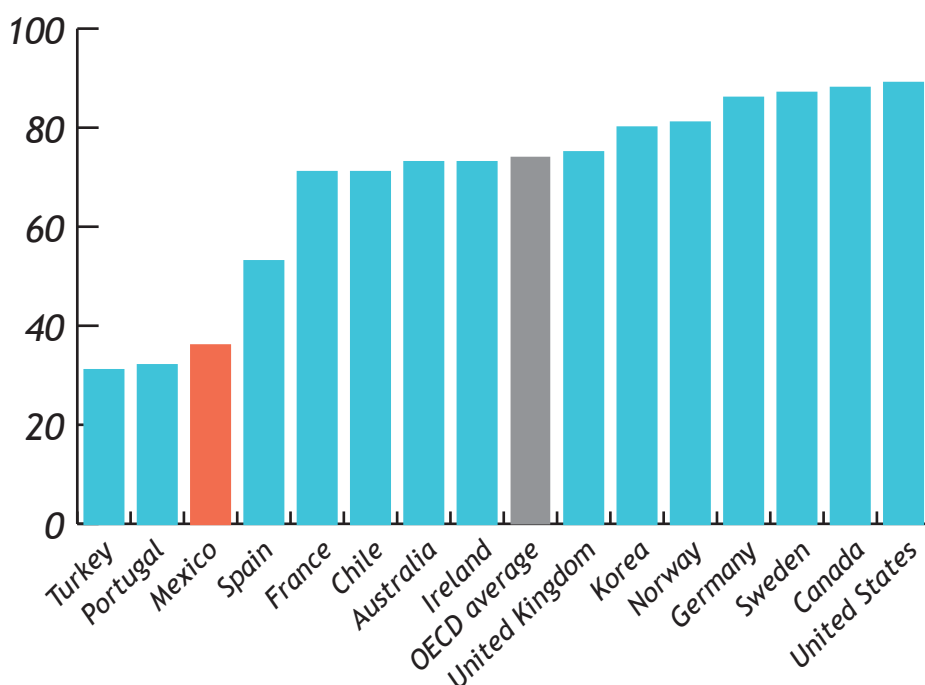
 **Figure 1. Evolution in Average Years of Schooling (1950-2010)**



Source: Barro and Lee, 2013.


Secondary education attainment in Mexico is far below that of other OECD countries, even for the younger generation. Only 36% of the working population in Mexico (ages 25–64) has attained at least a secondary education, as compared to the OECD average of 74% (See Figure 2). This trend is changing, and a greater percentage of the younger generation has attained at least a secondary education: 44% of Mexicans ages 25–34, as compared with only 23% of Mexicans ages 55–64 years old (OECD, 2012d). Nevertheless, Mexican youth are still well behind youth in other OECD countries where, on average, 82% of the population aged 25–34 has a high school degree, and Mexican youth are also behind other middle-income countries, as shown in Figure 3 (OECD, 2012d). As mentioned above, this might be attributable to the type of policies that have accompanied the increase in years of education, which need to go beyond a coverage approach to that of quality of education. Recent evidence suggests that the impact of human capital becomes strong when the focus turns to school quality and the type of type of skills developed (Hanushek, 2012).

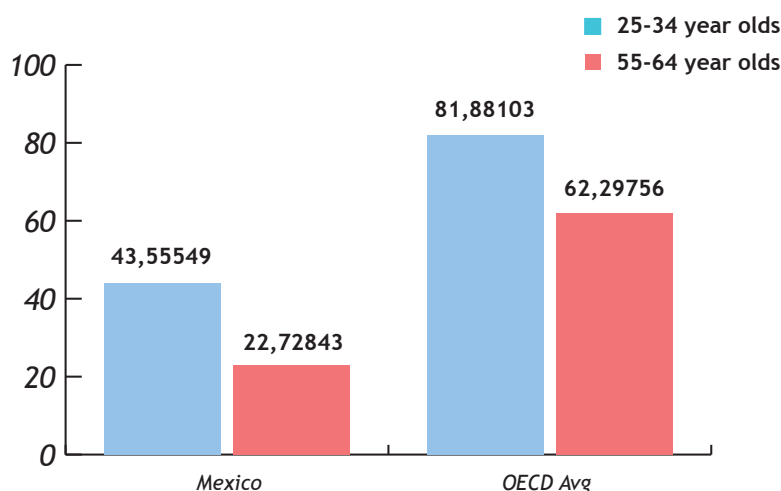
 **Figure 2. Upper-Secondary School Attainment as % of Total Working Population for Select OECD Countries (ages 25–64)**



Source: OECD Education at a Glance 2012. Indicator A1.

The challenge of addressing the low level of educational attainment in Mexico is related to the problem of keeping students in school. Mexico has the lowest graduation rates in the OECD: Only 47% of the children who started school in 2010 are expected to graduate from upper-secondary. Those who do complete school take longer to do so, with only 24% of students completing their upper-secondary education within the scheduled time of three years (INEE, 2011).

 **Figure 3. Percentage of the Adult Population (by age group) That Has Completed Upper-Secondary for Middle-Income Countries**



Source: OECD Education at a Glance 2012. Indicator A1.

Mexico has achieved nearly universal enrollment in early childhood, primary, and lower-secondary education, but by the time Mexicans reach age 15, only 54% are enrolled in school. This figure has increased only about 12 percentage points since 2000 (OECD, 2012d). In comparison, on average across OECD countries, 83% of 15- to 19-year-olds are enrolled in school; in Brazil the figure is 76%, and in Chile, 75% (OECD, 2012d).

To increase education levels, Mexico needs to keep kids in school. While primary enrollment is almost universal, only 54% of Mexican 15-year-olds are in school.

The main reasons Mexican youth cite for leaving school are financial concerns (not having enough money or needing to work to bring money home), but factors⁷ related to the organization of schools, their management, and their staff—particularly teachers—when considered jointly, appear to be even more important reasons for desertion (SEP, 2012a).

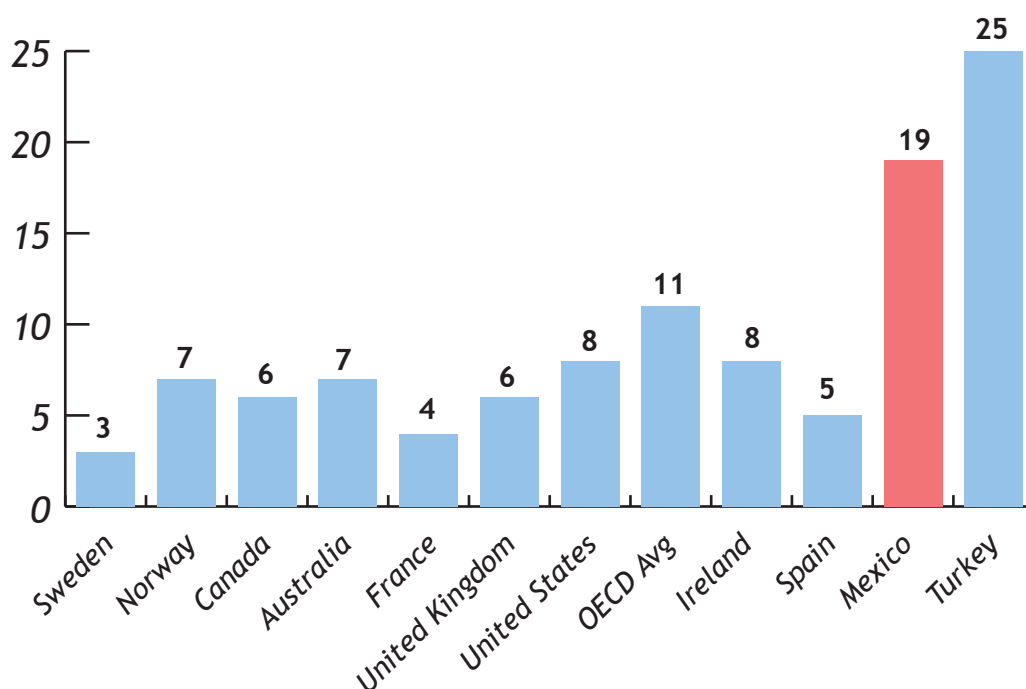
In terms of tertiary education, only 17% of the Mexican workforce overall and 22% of 24- to 34-year-olds have attained tertiary education, which is below the OECD average of 31% for the total workforce and 38% for 24- to 34-year-olds (OECD, 2012d).

Mexican youth are less likely to be studying if they are not employed than youth in other OECD countries. Almost half (45%) of Mexican youth ages 15-24 are not employed or in education, and 19% are not in employment, education, or training. These are higher than the OECD averages of 27% and 11%, respectively (OECD, 2012e). Women in Mexico are three times more likely than

⁷ Results are consistent with international evidence on desertion trends in Latin America. For more detail, see: Vidales (2009) and Cabrol and Székely (eds.) (2012).



Figure 4. Percentage of 15- to 24-Year-Olds Not in Employment, Education, or Training



Source: OECD Employment Outlook Data 2012. Indicator C5. Data for 2010.

men to fall into this category (OECD, 2012b). According to the National Youth Survey (Encuesta Nacional de la Juventud, 2010), most young women are dedicated to managing their households and raising their children, which implies that the gender gap may be largely the result of early pregnancies and marriages (OECD, 2012b).

Of those students who do go on to upper-secondary education in Mexico, the majority (60.5%) are enrolled in general education, while 39.5% are enrolled in vocationally oriented programs (SEP, 2013). This is below the OECD average of 43% of students enrolled in vocational education or training (VET) rather than general upper-secondary education (OECD, 2012d). The deficit of graduates in technical studies means that the country is not generating the number of workers with both academic proficiency and the technical skills necessary for advanced training in labor-intensive sectors that are strategic for the development of high-value supply chains.

Considering the new demands of today's knowledge economy, it is particularly troubling that less than 40% of Mexican workers receive training while employed, only 17% of workers have a tertiary degree, and less than 50% of Mexican youth have an upper-secondary degree.

Continuation of education and training is not common for Mexicans once they enter the workforce. According to the Mexican National Employment and Education Survey (MECE-ENOE) of 2009, only 37% of active workers had participated in job training programs (INEGI, 2009, and World Bank, 2013a).

Given existing labor market trends globally, over 60% of job openings in the developed economies are expected to require at least two years of postsecondary education and a technical credential or an associate degree, and the prospects for economic mobility for those without a secondary or tertiary education will continue to decline (Symonds, 2011). Moreover, it is increasingly evident in the literature that these higher levels of education are needed to develop the cognitive and non-cognitive skills needed to adapt to the constantly changing technological advances. It is estimated that new knowledge is now generated every three years, as opposed to every 20 years in 1990 and every 75 years back in 1965 (Székely, 2013).

Investment in Education and Training

Further improvements in the skill level of the Mexican workforce require higher levels of investment and better allocation of resources. Mexico's public investment in education as a percentage of GDP is in line with the OECD average, but expenditures per pupil are lower than in other OECD countries, and there are differences in terms of how Mexico allocates its resources and the quality it achieves with its investments.⁸

In 2009, Mexico's expenditures on education represented 6.2% of its GDP, up from 5.9% in 2005 and 5.0% in 2000 (OECD, 2012b). This is in line with the average education expenditure as a percentage of GDP in OECD countries (OECD, 2012b) (See Figure 5).

Mexico invests about the same percentage of its GDP on education as other OECD countries, but this translates into considerably less investment per student, given the size of the population.

Despite this, Mexico's actual expenditure per student is the lowest among OECD countries. On average, Mexico spends US\$2,293 per student for preschool, primary, and secondary education, as compared to the OECD average of US\$7,900. For tertiary education, Mexico spends US\$8,020 per student⁹ as compared to the OECD average of US\$13,728 (OECD, 2012b) (See Figure 6).

⁸ Although data on investment in education and training in Mexico and other OECD countries are not fully comparable due to some methodological differences and incomplete information, analysis of available data does allow for conclusions regarding the level of expenditures and allocation of resources in Mexico in comparison with those of its peers.

⁹ It should be noted that figures reported by the OECD do not coincide with the official figures reported by the Ministry of Education on its annual reports. This might be attributable to differences in the classification of secondary and tertiary education and the subsystems taken into account for expenditure analyses. Whereas the OECD data will be used for international comparisons, the rest of the paper will refer to official national data reported by SEP.

In addition to total expenditures, it is important to consider how those expenditures are allocated. A concern about the allocation of resources in Mexico is that the resources directed to education go primarily to staff salaries. As illustrated in Figure 7, in 2009 Mexico spent 91.7% of its current expenditures on staff compensation, while on average OECD countries spent 78% (OECD, 2012d). This implies that in Mexico little of the education resources are available for investment in quality improvements.

Figure 5. Public Education Expenditures as % of GDP

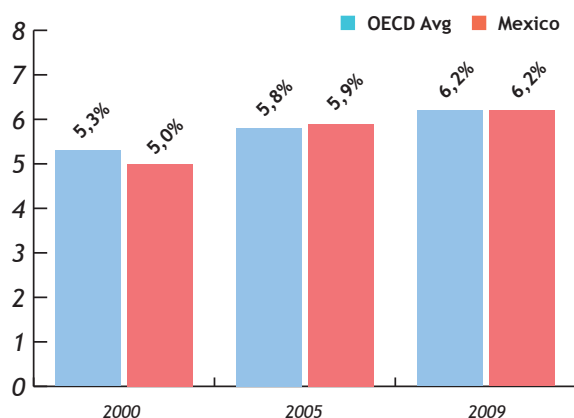
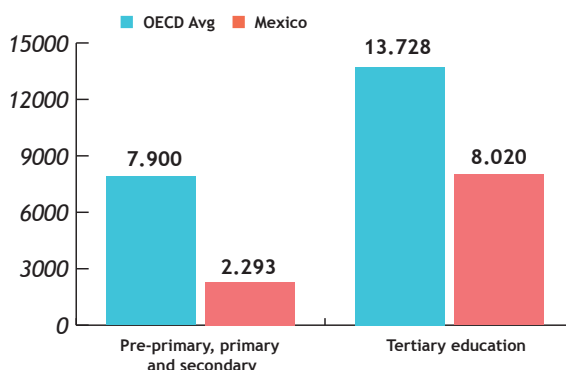


Figure 6. Public Expenditures per Student



Source: OECD Country Note on Mexico for the OECD Education at a Glance 2012

Furthermore, despite the high proportion of investment on teacher salaries, Mexico has fewer teachers per student than other OECD countries (See Figure 8). It has the highest student-to-teacher ratio among OECD countries for preschool education (25.4 versus the OECD average of 14.4) and for secondary education (30.4 versus the OECD average of 13.8), and has the second highest student-to-teacher ratio for primary education (28.1 versus the average of 15.8) (OECD, 2012b).

Figure 7. Education Spending Allocated to Teacher Salaries (%)

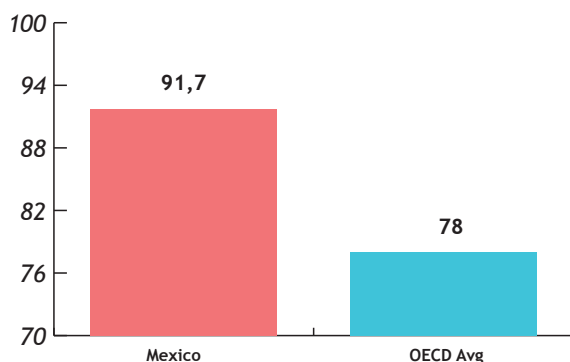
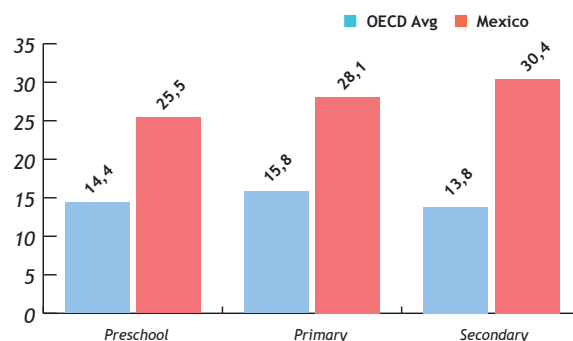


Figure 8. Student-to-Teacher Ratio



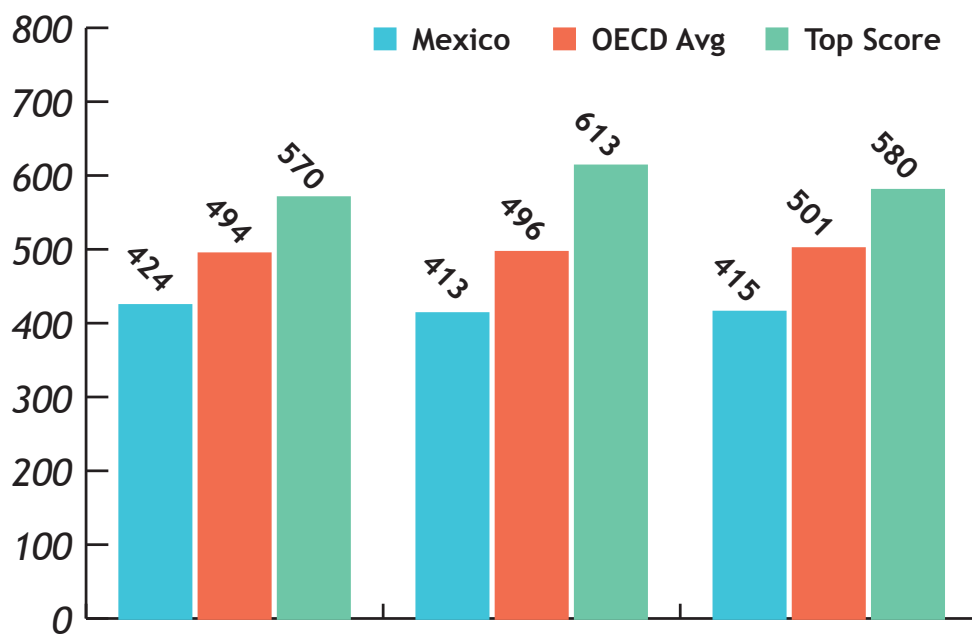
Source: OECD Education at a Glance, 2012

The inability of most educational subsystems to invest in quality initiatives may be influencing the poor results of the country's students. Mexico has participated in the International Student Assessment (PISA) tests since they were launched by the OECD in 2000. PISA measures the performance of 15-year-olds in reading, math, and science every three years and gives insights into the correlation between education spending and PISA test scores. Although there has been an upward trend in the results of Mexican youth, their scores are the lowest among the OECD countries (See Figure 9 for 2012, the most recent year for which results are available). In contrast, Asian countries outperform the rest of the world, with Shanghai, Singapore, Hong Kong, Taiwan, South Korea, Macau, and Japan amongst the top-performing countries and economies. This shows the need to look beyond Mexico's own borders for evidence of the most successful and efficient policies and practices. In a global economy, success is no longer measured against national standards alone, but against the best-performing and most rapidly improving education systems (OECD, 2013).

Mexico invests most of its education resources in teacher salaries, yet has the highest student-to-teacher ratios in the OECD.

In terms of investment in the training of the employed workforce, the financing system in Mexico differs from that of other LAC countries that finance worker training through a mandatory payroll tax generally used to finance state-run training institutes. Mexico does not have a payroll tax or a dominant national training provider, but instead provides incentives and co-financing for private sector investment in training on-the-job and through subsidized training centers. 2012 SEP data

 **Figure 9. PISA Mean Scores for Mexico in Comparison with OECD (2012)**



show that the scope of public training centers is very limited: they reach only approximately 1.5 million people per year (SEP, 2012b).

The Mexican government dedicates the majority of its resources to primary education, while private firms provide most of the financing for training of employed workers. The various programs related to workforce training and continuous education in Mexico today are described in Section III below along with their respective financing, but overall the Mexican government spends only about 1% of its education expenditures on adult education (World Bank, 2013a), not including the significant expenditures on workforce training through the job training centers and the Ministry of Labor's on-the-job training program. For active workers, according to the MECE-ENOE survey, the financing source for the most recent training courses in 68% of the cases was reported to be the employer, while 11.6% was financed through a government program and 14.8% was self-financed (World Bank, 2013a).

Labor reform of 2012 changed the focus on workers' right to training to that of employers' obligation to provide it. It also highlighted the relationship between the increase in workers' skills and productivity, while recognizing these aspects as the main objective of any training activity. Aware of the difficulties that small and microenterprises may face in providing training, labor reform urges the Ministry of Labor and the Ministry of Economic Development to provide appropriate training to small and medium enterprises (SMEs). The new law also calls for the adoption of instruments to measure labor productivity, which should be jointly developed by employers, workers, unions, and academia. It is important to take into consideration that, to avoid bureaucratizing this new provision, it is vital to move from a mandatory approach to one of conviction that it is good business to train workers and to support educational improvements to draw from a larger pool of better prepared youth entering the workforce. The more the supply side and the demand side work together and forge deeper changes in both arenas, the more there will be a fit between the supply and the demand in the labor market.



Chapter III

MEXICO'S CURRENT LIFELONG LEARNING SYSTEM

Overview of the System Today

As Mexico works to improve its productivity and prepare its workforce better to meet the evolving needs of the economy, it has to address the quality, relevance, and adaptability of its education and training system in order to facilitate the continual upgrading of the skills of its workforce. A country the size of Mexico faces particular challenges in creating a coherent lifelong learning framework that promotes consistency in approaches and quality across the system, but that also allows for flexibility at the local level to respond to specific needs of the labor market. Mexico has a complex and fragmented system that the government is working to restructure and modernize, utilizing a unifying framework of competency-based curriculum, based on an industry-driven national skills standards system.

Mexico is a large country with an array of programs that contribute to a lifelong learning system spread across many institutions.

The government is working to modernize its education and training system to facilitate continual skills upgrading and to strengthen its relevance to the productive sector.

Despite efforts in this direction, the elements that can contribute to a lifelong learning system in Mexico are still dispersed across several institutions responsible for education and training at various levels (See Figure 10). The Ministry of Education is responsible for formal education (which covers preschool through upper-secondary, as well as higher education), technical education (offered through upper-secondary vocational schools, technological institutes and polytechnic universities), and a vast job training system (comprising public job training centers (Centros de Formación para el Trabajo)).

The national training system in Mexico has hundreds of job training centers across the country. The federal government subsidizes 402 of these centers and 738 are funded by state governments. Although these centers fall under the authority of the Ministry of Education, they serve the training needs of both active workers and new entrants. In addition to these public centers, there are 14 autonomous centers and 4,862 private centers.

The Ministry of Labor and Social Protection (STPS) is responsible for most job and work-based training, which it supports through an array of active labor market policies that include incentives and co-financing schemes aimed at stimulating employer participation in training; technical assistance programs for businesses that invest in development of their human resources; and programs that support training and placement for jobseekers.

In addition to the national programs under the Ministries of Education and Labor, there are many programs sponsored by other government agencies that also promote lifelong learning to a certain extent. These include programs aimed at small enterprise development under the Ministry of Economic Development, and poverty alleviation programs such as Prospera (former Oportunidades), a conditional cash transfer program that promotes school enrollment and has been successful in increasing the number of years of schooling of the poorer segment of the population (the number of youngsters from benefited households who are enrolled in upper-secondary education increased from slightly more than 43,000 in 2000 to more than 1 million by 2011 See Ministry of Social Development, SEDESOL website).

Alongside these government programs, the private sector offers some training through numerous business chambers and private institutes, employers provide firm-based training (but at a lower rate relative to other countries), and worker unions sponsor training for their members. The private training industry is flourishing in urban areas, and firms can access myriad private providers that can design tailor-made programs.

An important effort to guide consistency and quality across the system has been the attempt to create a skills standards-based certification system to have a more objective signaling device of the skills that the market required, which would help policy makers gear education and training content to employer needs. The model has been under development since 1994, when the national Skills Standards Board (Consejo de Normalización y Certificación de Competencias Laborales [CONOCER]) was established. Since its creation, all technical education shifted to a competency-based education system that would teach to the standards that the Skills Standards Board would create. After 20 years, CONOCER is far from generating the standards educators need to design relevant content and this lag has prompted educators to seek out employers through a variety of channels. Over this period and as a result of a shift in policy in 2008 that called for measuring the success of technical education by the employability of its graduates, Mexico's education and training system became more responsive to the competencies demanded by the productive sector, with much of that work carried out independent of CONOCER. Important challenges still exist to assure the consolidation of a wider and more integrated lifelong learning system oriented to improving workforce productivity and the competitiveness of key sectors of the Mexican economy.

It is within this context that Mexico can continue reflecting on the best possible way to create a cohesive lifelong learning framework appropriate to its growth requirements. The remainder of this section summarizes in more detail the current status and pressing challenges of each of the key elements that comprise the lifelong learning system in Mexico, namely: the national skill standards certification system; upper secondary education; higher education; training of active workers; labor market information services; and innovating and better mechanisms to coordinate education and training institutions with the productive sector.

 **Figure 10. Lifelong Learning Supply in Mexico**

Formal Education

Basic (12 years: preschool, primary, and secondary)

- Enrollment: 26 million
- Cost/student: US\$3,700

Upper-Secondary (3 years)

- Enrollment: 2.6 million
- Cost/student: US\$2,200

Higher (4-5 years)

- Enrollment: 2.8 million
- Cost/student: US\$4,900

Vocational Education**

Technical Vocational Education

- Enrollment: 1.7 million
- Cost/student: US\$1500
- Public investment: US\$1.5 billion
- 171 tracks, 1,061 schools

Technological Institutes and Polytechnic Universities

- Enrollment: 700,000
- Cost/student: US\$2,900
- Public investment: US\$2.1 million
- 265 tracks, 411 schools

*n/a - Information not available.

** Include internships and other workplace learning opportunities.

Source: Morán and Ricart. (2012). IDB Seminar “Effectively Linking Upper Secondary Education Policies to Employment: Perspectives for Mexico from International Experience,” based on data from the Ministry of Education (school year 2011–2012); Ministry of Labor (2012); Ministry of Economic Development (2011–2012); OECD Education at a Glance 2012: OECD Indicators (with data from 2009).



Job Training

Job Training Centers

- Enrollment: 1.5 million
- Public investment: US\$195 million
- 246 training courses and 55 specialties, in 402 federally funded centers

On-the-Job Training (OJT)

Ministry of Labor (STPS):

Bécate (STPS/enterprises)

- OJT (1-3 months)
- 230,000 job seekers
- Public investment: US\$50 million

Ministry of Economy:

Training and Consulting Program

- 23,000 enterprises
- Public investment: US\$37 million

COMPITE

- 40,667 enterprises
- Public investment: n/a
- Training and Entrepreneurial Modernization Program - n/a

Enterprises:

Own training centers - n/a

Business Chambers:

Training programs by sector - n/a

Unions:

Training programs for members - n/a

Private Training Agencies:

Particular/private training services - n/a

Skill Standards Certification System:¹⁰ An Unfinished Symphony



Box 1. CONOCER, the Skills Development Board

CONOCER is the federally funded national Skills Standards Board, responsible for the promotion and coordination of the skills standards model, which aims to contribute to Mexico's economic growth, educational development, and social progress.

A key objective is to strengthen the quality of the workforce and in turn contribute to enhancing worker employability and enterprise productivity.

At the strategic level, a key element of the standards system relies on sector committees, composed of industry leaders and workers, who define their human capital development agenda and identify the skills that are relevant to this agenda within their industries. In addition to the industry sector committees, CONOCER also promotes the creation of committees that define standards for the social and public sectors.

Evolution of CONOCER and the National Skills Standards Certification System

At the heart of a lifelong learning framework are the core competencies that define what people should learn. The Mexican skills standards and certification system, which seeks to identify the competencies required for work, was designed in the mid-1990s. The impetus for the system in Mexico came from the structural changes experienced following passage of NAFTA and membership in the OECD, both of which brought shifts in the economy and produced a shortage of skilled workers to meet the demands of economic liberalization.

Mexico adopted an approach intended to bring increased rigor and job relevance to technical education and job training and to determine the basic skills or core competencies that every worker should have, such as workplace literacy, problem solving, communication, etc. By testing and certifying workers' skills regardless of how they acquired the skills, it was expected that this approach would facilitate the recognition that skills and knowledge are the currency for employment and career advancement. The model sought partnerships with industries and ways to ensure that industry-relevant skills and knowledge could be acquired in many ways, including on-the-job. These skills would be defined and regulated through a skills standards and certification framework created for this purpose.

The national skills standards certification system was meant to establish a "common language" to facilitate interaction between suppliers

¹⁰ For the purposes of this paper, when we refer to a skills standards and certification system we are referring to the CONOCER competency-based certification system that was created in the 1990s.

and consumers in the labor market and in human resources development. The idea was that skills standards could be consulted by education and training institutions, employers, and workers. In this way, education and training institutions could design courses according to the needs of businesses; employers could know the qualifications that were available and use them to recruit, train, and certify their employees; and workers could learn about the possibilities of being educated or trained according to growth areas in the labor market.

At the heart of a lifelong learning framework are the core competencies that define what people should learn. The skills standards system aimed to provide a unifying framework for those competencies.

However, implementation of the system has run into various difficulties, mainly related to a lack of strategic vision on the part of CONOCER and the limited adoption of the system within the productive sector.

As the coordinating body for the national system, CONOCER's main responsibilities are centered on the regulation of job skills standardization and certification processes. Standards are developed by industry-led committees formed by leading businesses and/or other key social and public institutions that have been allowed to develop standards since 2008 (See Box 1).

CONOCER has undergone reforms along the way, and its operations can be divided into two distinct phases. During its first phase of operation in the 1990s, CONOCER developed a highly structured methodology, based largely on the model used in England. In theory, the methodology is sound; it produces an accurate description of what the competencies should be for any given job function. However, the process lacked strategic focus, and the methodology was found to be cumbersome by firms that participated in the process. The drive to create standards in order to consolidate a system and show results prompted the creation of standards in areas that had little value added and were related to less productive lines of activity. This dispersed efforts in an early stage.

An evaluation of CONOCER's 1996 initial pilot phase found that most of the companies that participated did help define standards at first—including several companies from dynamic sectors such as tourism and construction—but most of the participating companies eventually found it more efficient to adapt international standards or develop their own, and opted for in-house certification schemes rather than working through the CONOCER system (Kappaz and Siegel, 2004). That evaluation's conclusions confirmed the findings from consultations held by the IDB and the World Bank with Mexican private sector representatives in 2003, which revealed that key companies that participated in the first CONOCER efforts stopped using these standards because the language was too bureaucratic, the standards were not adaptable to their corporate training schemes (they did not take into account the various nuances and the nature of certain industries), and the evaluation and certification entities did not have sufficient presence in the locations where industry and workers could access them (IDB, 2003).

In addition to the complexity of the system, the use of CONOCER standards was also affected by

adverse incentives, such as the fact that companies that participated in the creation of standards had to then pay to register those standards, and companies lacked influence to design evaluation and certification mechanisms tailored to their needs.

Another issue during the first phase of CONOCER's operations was the lack of connection between CONOCER's occupational standards and those that schools had to apply to curriculums to meet their mandate to transition to a competency-based educational system. In the late 1990s, because CONOCER was not creating relevant standards, a series of technical education subsystems created their own standards, which led to a proliferation of standards in the market and caused confusion. The institutional standards developed outside the CONOCER framework weakened the purpose of creating a signaling device through an organized skills standards system. An attempt is being made to correct this in the curriculum planning context (discussed in the section below on upper-secondary education reform).

The standards that were developed by CONOCER did not prompt a certification system as originally expected. The evaluation and certification process, which was created independently by CONOCER rather than by each industry, tended to be viewed as top-down and not always aligned with industry requirements. This impression that neither the CONOCER standards nor the certifying institutions' evaluation and accreditation processes were of high quality, undermined their credibility in the productive sector. As a result, very few of the standards were applied in certifications. Between 1995 and 2000, only 10% of the 640 standards developed by CONOCER were actually used in certifications (Carvallo, 2012).

In general, the certification process became supply-driven rather than responsive to the demands of the labor market. Research presented at a 2005 roundtable on the status of the Mexican system noted that most of the certifications had been granted as a result of initiatives originating from the educational sector and not in response to the demand from the productive sector. In an effort to promote a culture of certification, several publicly funded programs attempted to require the certification of students within the vocational education system and of workers within training programs. Certified individuals were left wondering why they were certified, or even asking, "Who wants it?" or "Who is asking for the certification?" (El Sistema de Formación Vocacional en México, Round Table, 2005).¹¹ As there was no indication from employers that the certifications were credible or had a common currency value from their perspective, observers started to question the validity of the system.

The system's continuing low profile in the labor market and the lack of political will in support of the system contributed to the temporary suspension of CONOCER from mid-2003 until the beginning of 2006. When re-established in 2006, it was given a new legal status as a parastate entity under the auspices of the Ministry of Education, thus shifting the leverage on CONOCER's board

¹¹ As part of the research activities of the paper *The Vocational Training System in Mexico*, a roundtable discussion on vocational training was organized: "El Sistema de Formación Vocacional en México," August, 26th 2005. Casa del Tiempo, Universidad Autónoma Metropolitana. The participants at this roundtable include: Luz María Castro Mussot (INEA); Leticia Placencia (INEA); Rosa Carvallo (Formo Internacional S.C.); Consuelo Ricart (Banco Interamericano de Desarrollo); Agustín Ibarra Almada (Valora Consultores).

of directors to the public sector, albeit with continued private sector participation. This was a departure from the initial governance structure of CONOCER which operated as a semi-autonomous trust and had an image of institutional independence that legitimized its actions among the different social actors (Arteaga et al., 2010).

CONOCER's operations thus entered a second phase in 2006 this phase continued through a restructuring of CONOCER in 2008. The certification process and the standards themselves were simplified to make the process more user-friendly. In addition, under the new structure, CONOCER began to register standards actually being developed by the industry. Another change during this phase was that CONOCER eliminated its co-financing of sector initiatives to develop standards, but maintained outreach efforts in order to revive the industry's confidence in the system.

The process of industries registering their standards turned out to be difficult and dispersed, given the new hands-off approach of the organization. CONOCER also appears to have focused most of its outreach efforts on persuading public sector agencies and non-profit organizations to register standards, rather than on the more strategically important industries for the country. Only 108 of the 286 standards that were registered by CONOCER since 2008 correspond to standards developed by the 11 key productive sectors of the economy (Carvallo, SEP, 2012; Székely, 2014b).¹² Furthermore, according to a recent evaluation of CONOCER, most certifications issued in recent years are concentrated in standards created by two public institutions. One out of every three certificates is either “credit and housing advice”—used by a publicly run housing program—or “childcare” standards for public childcare centers (Székely, 2014b).



Box 2. The Case of the Automotive Industry

A recent IDB study (Carvallo, 2012) that draws from the experience of three main strategic sectors in the Mexican economy (automotive, construction, and tourism) shows that skills standards registered by CONOCER are not congruent with those required by the industry nor those recognized internationally. For instance, in the automotive industry, the areas of product design and development, organizational management, timeliness, cost-efficiency, quality management, process supervision, systems development, and many other relevant functions that directly affect firm productivity have not been taken into consideration by CONOCER's automotive sector committee. One example is the use of the Six Sigma methodology for problem solving and facilitating learning in the automotive environment industry. Another red flag is that, for an industry that employs over half a million workers, only 50 individuals have sought a CONOCER certification and these are for standards that are outdated.

¹² The priority sectors were: automotive; construction; information technology; trade; mining; logistics; electrical energy, gas, and fuel; telecommunications; and food processing.

One of the problems that contribute to the low number of standards registered is the fact that CONOCER internal procedures do not contemplate the registration of international standards, such as the American Welding Society standards or the Microsoft certification standards, even though those are often the standards and certifications recognized and demanded by firms in the Mexican market. This continues to perpetuate a dual system: one captured by CONOCER and a parallel certification market that CONOCER does not capture (See Box 2 for a summary of this problem as related to the automotive industry). Even those firms that participated in previous stages of CONOCER, including sector committees in 2010, believe that under the new regulation the system is more bureaucratic, costly, and with uncertain benefits and returns for them, which has prompted their withdrawal from the process (Székely, 2014b).

Current Challenges with CONOCER and the National Skills Standards Certification System

The centralized administration and bureaucratic cost structures, along with poor capacity to analyze industry trends and to focus on those sectors, economic activities, or even firms with the stronger technological dynamic and economic potential, have made it difficult for CONOCER to keep abreast of changing needs of the productive sector. While some industries do have forecasting systems, there is no indication that CONOCER gathers this intelligence on industry trends. Even though CONOCER has a tripartite board structure with employers and labor unions as well as the government, its governance structure has not proven effective in influencing planning based on private demand. This may in part be because of the lack of strategic leadership exerted by the representatives on the Board. Since 2013, the participation from State Secretaries, productive sector top leaders, or union organization heads has been lax (Székely, 2014b). Also, the sector committees have not always shown the capacity to make strategic decisions. This may be because committee members are often human resource managers instead of senior company executives or are representatives from the strategic planning units or business chambers that do not always represent the full range of diverse business interests (De Anda, 2010). In addition, technical capacity at CONOCER has deteriorated over the years. There has been a series of changes of authorities and a high level of rotation among staff in charge of providing technical support, refining methodology, ensuring the quality of standards, and identifying international best practices for each industry. This has hindered the institutional development needed to consolidate such a system.

CONOCER still faces significant structural constraints related to: (i) the sparse use of standards by the productive sector because the standards do not meet their needs (since 2007, only 35% of existing standards has been utilized, whereas 39% of standards has never been used for certification purposes (Székely, 2014b)); (ii) the absence of a strategy for reaching out to priority sectors and capturing relevant standards in view of productive trends; (iii) the lack of technical guidance and capacity to analyze productive trends and do skills forecasting; and (iv) ongoing concerns of employers regarding fees associated with registering and using standards that they help develop for the public good (Carvalho, 2012). CONOCER's efforts still seem to lack a productivity approach, creating standards for public service agencies and other social networks, among other less critical activities.

The current leadership of CONOCER does not have the participation of business leaders from the sectors that really matter to the country's economic growth. Although some of the committees have better representation than others, overall the presence of leading firms in each industry is missing. This differs from the structure in other countries. In Singapore, for example, key representatives from the private sector are members of the Skills Standards Council. These include CEOs, managing directors, and directors of leading companies of the 11 priority sectors for which standards are developed (SPRING's website). In India, the Sector Skills Councils are created by industry, often sponsored by one of the large employer organizations such as the Federation of Indian Chambers of Commerce and Industry (FICCI) or the Confederation of Indian Industry (CII). Those industry skills councils submit proposals to the National Skills Development Corporation (NSDC), which provides seed funding for approved proposals (Sims, 2013).

The overarching challenge for CONOCER's future is the fact that most of the efforts to restructure the organization have not been fruitful. The most recent evaluation concludes that the costs of the system as it is now exceed its benefits, which raises questions about its viability under the current operational model (Székely 2014b). Perhaps the main lesson learned is that a standards and certification system is one of various ways to bring education and the world of work together in an effort to improve education and training. There may therefore be a need to re-evaluate the value of CONOCER as a key regulating entity and shift toward a policy that seeks to consolidate a broader skills development system that incorporates all of the different institutions that intervene in this process.

Upper-Secondary and Vocational Education

Overview of Current Upper-Secondary System in Mexico

Upper-secondary education is a key element of the lifelong learning process, as it seeks to provide specific technical skills and higher-level cognitive skills to prepare youth who will not necessarily continue to higher education and who represent the new entrants to the workforce. Improving the relevance and quality of upper-secondary education can facilitate the school-to-work transition.

The Mexican upper-secondary system covers three years of study beyond the nine years of compulsory basic education. Under the purview of the Undersecretariat for Upper Secondary Education (Subsecretaría de Educación Media Superior, SEMS), Mexico provides general and vocational education, as well as training for work. The system in Mexico is diverse and fragmented, with hundreds of subsystems covering general and technical education provided by four types of institutions: national public institutions, state institutions, preparatory schools associated with public universities, and pre-

Upper-secondary education is a key element in the lifelong learning process as it provides the cognitive and technical skills on which future learning will build. Relevant and quality education can facilitate the school to work transition.

paratory programs associated with private universities. Figure 11 summarizes the publicly funded programs under SEMS.

The upper-secondary system, not including the job training centers but including both private and public general and technical baccalaureates, currently serves 4.3 million students, representing 12.5% of students in the education system and 69.3% of the total population of 16- to 18-year-olds (SEMS, 2012); 17.5% of these students attend private institutions, while the other 82.5% attend publicly funded schools. The total number of students enrolled in the 2011–2012 academic year, in both publicly funded and private institutions in each of the upper-secondary subsystems is presented in Figure 11. It should be noted that one of the main challenges of this level is to keep students in schools, as only 45.6% of those enrolled are able to finish their studies.

 **Figure 11. Upper-Secondary Education Programs under SEMS**

Education level		Institutions	Options offered	Enrollment	% of Total
General Baccalaureate		Provided by general upper-secondary schools, under the direction of a SEMS office (Dirección General de Bachillerato) and the decentralized baccalaureate completion program (Colegio de Bachilleres, COLBACH).	Single track	2,619,715	60%
Vocational Education	Technical Baccalaureate	Provided by sector-specific technical schools operated under departments within SEMS, namely: <ul style="list-style-type: none"> • Agriculture (Dirección General de Educación Tecnológica Agropecuaria, DGETA), • Industrial Technology (Dirección General de Educación Tecnológico Industrial, DGETI), and • Oceanography (Dirección General de Educación en Ciencia y Tecnología del Mar, DGEcyTM). 	96 careers	1,330,411	32%
	Professional Skills Training	Provided by the decentralized National College for Technical Professional Education (Colegio Nacional de Educación Profesional Técnica, CONALEP)	48 careers	383,463	8%
Training for Work		Provided by the public job training centers (Dirección General de Centros de Formación para el Trabajo, DGCFE). Although these training centers serve secondary education students, their main focus is understood to be to provide training for the existing workforce and thus are discussed further in the workforce training section of this paper.	58 training programs	1.5 million	-

Evolution of Reforms in Upper-Secondary

Mexico has made important strides in aligning its upper secondary education system to the needs of the productive sector and in improving the quality of the content, administration, and teaching at this level. This process began in the mid-1990s with the introduction of competency-based learning that would be oriented by a skills standards and certification system (CONOCER). The process was reinforced with enactment of the 2007 Upper Secondary Education Reform (Reforma Integral de la Educación Media Superior, RIEMS), which is still under implementation.

While the evolution of competency-based curricula in the 1990s was intended to bring cohesion and standardization to education planning based on measurable results, challenges remained in ensuring (i) the relevance of educational content to the productive sector, (ii) the alignment of curricula, and (iii) the transferability of credentials across subsystems. The fact that CONOCER lagged behind in providing universal standards prompted various subsystems to develop standards independently, using CONOCER's methodology with various firms at the local or regional level. This resulted in the proliferation of various standards that were not necessarily endorsed by the industry and caused fragmentation and created a lot of duplication and confusion.

The RIEMS reform was designed to address these challenges in the system by introducing comprehensive reforms to increase quality and relevance of upper-secondary education. An overarching aspect of the reform was the development of a consolidated National Baccalaureate System (Sistema Nacional de Bachillerato, SNB) that created unifying elements across all of the general and technical schools. In order to support the quality of programs within the SNB, the RIEMS reform includes the following specific elements: (i) the definition of new coordination and regulation structures; (ii) the development of a skills-based Common Curriculum Framework (CCF); (iii) the development of additional assessments, one for school accreditation and another for student qualifications (measuring the attainment of skills); (iv) a set of new tools and institutions geared toward professionalization of management, teacher training, and comprehensive student assessment; and (v) mentoring and student welfare support, including tutoring, career counseling, and scholarships.



Box 3. Benefits of a Competency-Based Approach

- It prepares students to develop in diverse contexts throughout their lives.
- It favors knowledge over memorizing.
- It ends the dispersion that existed among subsystems at the upper-secondary level and facilitates, among other things, student mobility.
- It allows curricular contents and study programs to become more flexible and adaptable to specific needs of the productive sector.

Coordination on curriculum content is managed by SEMS through one of its administrative units, the Sectoral Council for Academic Development (Coordinación Sectorial de Desarrollo Académico, or COSDAC), which is responsible for designing and implementing the framework for the establishment of the SNB.

COSDAC is working to align all technical standards that are relevant to certain career paths, to ensure that curriculum content is aligned with employer requirements. But COSDAC still faces difficulties in keeping abreast of industry trends, mainly because of a lack of instruments to identify future skills needs and to the length and bureaucracy of the process for updating curricula. COSDAC could benefit from the

examples of other countries such as the move of the European Union member countries toward adoption of an integrated skills forecasting system. Asian countries such as Korea and Singapore have also adopted ways of identifying future skills needs through international benchmarking and careful analysis of key employer trends. It is important to note that this is not a static process and COSDAC has an ongoing role to update programs, contents, and standards according to market signals. In this sense, by strengthening its forecasting capabilities and links to employers, COSDAC could become a powerful planning instrument to guide educational improvements.

The RIEMS reform has consolidated a national baccalaureate system with a common curriculum that defines core generic competencies for all students and is working with industry to refine the basic and extended technical and professional competencies.



Box 4. COSDAC, an Interesting Vehicle for Strategic Education Planning

COSDAC is an academic council assigned to the Undersecretariat for Upper Secondary Education. Its mandate is to coordinate educational planning and promote innovation and quality improvements within the framework of the Reform to the Upper Secondary Education.

COSDAC is responsible for fostering education planning in a way that considers productive sector requirements and aligns education efforts to the country's growth strategy. Therefore, a key function is to promote collaborative networks with stakeholders and to deve-

lop programs and projects with national and international institutions and academics.

Key activities of COSDAC include:

- The design and implementation of the Common Curricular Framework
- Teacher training at the upper-secondary level and professional development programs at the staff and managerial levels.
- Educational research and innovation projects and, more specifically, the development of information technologies related to education.

The Common Curriculum Framework, which uses the employability skills identified by the OECD, established a single generic profile of competencies that all students are required to meet, whether they are studying in a technical or general education program. This facilitated consistency across schools. The generic,¹³ disciplinary, and professional competencies are being aligned at the national level for the purpose of correcting the proliferation of standards that were adopted by different subsystems and institutions over time. For students, the new alignment of competency-based curriculum standards facilitates movement between schools, or between school and work.

As part of RIEMS, Mexico introduced a system-wide assessment of student attainment, as a complement to PISA, that includes a national test, ENLACE (Evaluación Nacional del Logro Académico en Centros Escolares), which tracks how schools are doing in terms of student learning outcomes, and also a new national survey, ENILEMS (Encuesta Nacional de Inserción Laboral de los Egresados de la Educación Media Superior), which tracks the employability of graduates. The ENILEMS methodology is still being refined, but the measurement of outcomes based on the employability of students once they complete school is an innovation for Mexico because it measures labor market outcomes and thus changes the paradigm of education to a results-based culture. ENLACE is not yet showing improvements in performance: In 2012, 70% of students scored below the insufficient or basic level in math competencies, whereas 49% of students scored below this level in communication competencies (SEP, 2013), but it is too early in the process to see change in student outcomes.

Regarding institutional quality, RIEMS created a new accreditation system that defines performance standards. Schools are evaluated based on minimum standards in terms of student mentoring and counseling, teacher development, infrastructure and equipment, management, evaluation, and administrative mechanisms. The reform has also placed an emphasis on improving the quality of school management and teachers. New selection requirements for teachers and directors are being instituted. This will increase transparency and ensure more quality. In recent years, in-service training has also been modified, with all teachers now having access to a competency-based teaching course and the opportunity to be certified upon completion of this course.¹⁴ The objective is to ensure a certain level of teaching skills for each teacher regardless of background.

In 2012, upper-secondary education became compulsory, extending the number of compulsory years from 9 to 12. The government's objective is to achieve universal coverage by 2022. To complement efforts to improve the quality of education, the new administration presented a reform proposal in 2013 that seeks to deepen the professionalization of teachers.

¹³ The generic competencies instituted under RIEMS focus on building confidence and personal criteria; art appreciation and interpretation; living a healthy life; communicating effectively; developing critical thinking and problem solving; strengthening team work; and civic and ethical participation in society.

¹⁴ The training program is voluntary. Almost 57% of the total of upper-secondary teachers already completed the training. For more detail, see Székely, 2014a.



Box 5. Trayectos Técnicos Tailor-Made VET Courses

CONALEP has innovated through Technical Trajectories (Trayectos Técnicos), which are designed jointly with industries interested in forming and recruiting students directly from CONALEP. These trajectories show promise because students can aspire to better-paid jobs and certifications that have value in the market, thus making them more employable over time.

An example of these courses is the “Basic Industrial Electromechanical Training” course, jointly developed by CONALEP educators, teachers, and technicians at the federal and state levels

in the state of Nuevo León, and technicians and managers from Ternium Mexico, a leading siderurgical complex in the steel industry. With the implementation of this Technical Trajectory, Ternium saves on the more than 260 hours that it typically spent on the training of new hires.

This course applies to tracks in mechatronics, industrial electronics, machinery and tools, and metallurgy. In 2012, 125 of 855 CONALEP state graduates were hired by Ternium as a result of the project. Currently, the program is expanding to other states and sectors.

Innovative Alternatives to Respond to Employers’ Needs: CONALEP

Reaching out regularly to employers is critical to ensure that schools provide education that is relevant to the needs of the workplace. The National Technical Professional College (CONALEP) has been recognized for its best practices on this field. CONALEP operates as a decentralized agency under SEMS and is semi-autonomous in its operations. It is the main provider of technicians for the productive sector and has been widely recognized for the active participation of its graduates in the labor market. CONALEP students participate in the labor market at a much higher rate than the similar age cohort of the general population, and at a much higher rate than graduates from the other more traditional technical upper-secondary schools. CONALEP designs its curriculum based on industry needs, adapting courses as needed based on local demand. The curriculum design process at CONALEP uses competency-based methodology.

Several evaluations of CONALEP have documented these positive outcomes. A 1996 study concluded that, on average, CONALEP graduates found jobs faster than individuals with similar charac-

teristics who did not enroll in CONALEP (Lane and Tan, 1996; Key, 1998; Carney et al., 2000¹⁵). A more recent tracer study, conducted for CONALEP by FLACSO, which did not compare results with a control group but did assess outcomes¹⁶ of a representative sample of 2,058 youth who graduated from CONALEP in 2009, found that 70% of CONALEP graduates were working in jobs related to their field of studies (de los Heros, 2010). Evaluations of CONALEP have also found that the earnings of CONALEP graduates increased rapidly within the first two to three years of employment. Furthermore, employers of CONALEP graduates report positive impressions of the graduates and the academic program. In a 2002 survey, approximately 72% of firms defined the academic level attained by CONALEP students as high or very high, and about 55% to 60% of employers reported that the technological level of a CONALEP education is high or very high (López-Acevedo, 2002).

A CONALEP initiative that shows promise for deepening the connection with the productive sector has been the development of special technical tracks, or trajectories (Trayectos Técnicos), which are specialized courses taken within the last three semesters of a specific course of study, with content defined together with local industry partners in order to ensure that graduating students will have the specific skills those businesses require. Technical Trajectories have already been developed for the steel industry in the state of Monterrey (see Box 5) and for metal processing in the state of Guanajuato. Course content is under development for the industrial food-processing industry in Chiapas and for the automotive industry in Guanajuato.

Each trajectory is designed to meet labor market demand in the geographic region of specific CONALEP schools, and the content is defined together with one or more of the leading companies providing jobs in the region. For example, the automotive trajectory in Guanajuato is being developed with Volkswagen (CONALEP, 2012a). Students benefit from direct instruction delivered by firm experts and on-the-job training activities that familiarize them with current technologies, in addition to providing access to relevant content.

Remaining Challenges for Upper-Secondary Education

As summarized in Box 6, RIEMS has made advances in improving the quality and relevance of the upper-secondary education system, but some persistent challenges remain. The Common Curriculum Framework and the National Baccalaureate System need fine-tuning to ensure that the standards they apply are relevant, useful in the future, and of a high level, and that the programs are constantly updated to respond to a strategic agenda of upgrading the workforce development system.

¹⁵ All these evaluations used graduate tracer surveys to assess the qualitative labor market profile of CONALEP graduates. Although they encountered some problems with regard to the construction of a non-arbitrary control group, all of them consistently concluded that CONALEP graduates actively participate in the labor market at a much higher rate than the similar age cohort of the general population, and at a much higher rate than graduates from traditional technical high schools. On average, CONALEP graduates found jobs faster than control individuals, and about two-thirds of CONALEP graduates worked in jobs related to the specialization they had studied. Using cross-cohort comparison, these evaluations also suggested that CONALEP graduates' earnings increased rapidly within the first two to three years of employment. For more detail, see López Acevedo, 2005.

¹⁶ The study monitors graduates two and five years after completion of their studies and considers their employment rate, wages, employment conditions, sector of activity, main skills required at the workplace, correspondence between their field of study and their entry-level work or subsequent employment, and their overall perception of their training at CONALEP.

While the initiatives to strengthen linkages to the productive sector, such as CONALEP's Trayectos Técnicos, offer great potential to provide graduates with better jobs while also involving employers in educational planning and curriculum development, these initiatives still represent isolated efforts that have not been translated into systematized contents defined with industry in different states. Despite the fact that CONALEP evaluations demonstrate positive outcomes, less than 20% of students who seek a technical track for their upper-secondary education are enrolled in CONALEP. Actually, since 2000, CONALEP enrollment rates decreased and remain relatively modest (the 2005–2011 average corresponds to 270,000 students enrolled per year). This decrease in student demand for overall technical education may be attributable to a lack of necessary information and professional orientation for youth to exercise informed career choices.¹⁷ As in other countries, the stigma against technical education persists. Another possible explanation is the expectation that most youngsters have to reach tertiary education and receive a formal college degree.¹⁸ CONALEP has been typically identified as an institution that does not offer a full program that would give entry to tertiary education. This is no longer the case, after RIEMS, CONALEP and all other upper-secondary subsystems are subject to the same curricula and standards, which means that their graduates are prepared for higher education or postsecondary technical schools.

Perhaps the most complex challenge that still remains in the reform is related to the attempt the current government is making to introduce a major overhaul in the system's human resources strategy through the professionalization of teachers. This will require higher standards for teachers at the entry level, as well as more support for in-service training and skills updating to meet recertification requirements, combined with ongoing measures of teacher performance linked to student attainment. This will involve a major revision of the selection and professional development process, to institute a system that values teachers' credentials and performance based on measurable criteria. These reforms challenge longstanding practices within the education system and create uncertainty among educators. More efforts are needed to enhance the dialogue with teachers and facilitate acceptance of the process. Alternatives recognizing teachers with existing training and professional experience are also needed.

¹⁷ Students often rely on informal sources of information, such as family and friends, to find out about upper-secondary programs and the situation in the labor market. As a result, their career choices are influenced by family preferences rather than by reliable information on labor outcomes and opportunities. Good career guidance is particularly important in light of the complex structure of the Mexican system. The lack of capacity to offer quality career guidance at the school level also leaves students unequipped vis-à-vis the options available. Coordinated action among different levels and subsystems should exist to ensure that students receive a comprehensive picture of careers and market prospects.

¹⁸ Although this information is not available, an approximation suggests that 85% of students enrolled in upper-secondary education expect to access higher education.



Box 6. Integral Upper-Secondary Education Reform (RIEMS) Implementation Status

Problem before RIEMS	Changes implemented through RIEMS
<p>Diversity and discontinuity of upper-secondary education programs.</p> <p>Providers at four different levels:</p> <ul style="list-style-type: none">• Federal• State• Publicly financed schools that depend on/report to autonomous universities• Private schools <p>Each of these levels is in turn integrated in various subsystems with the authority to deliver academic degrees.</p>	<p>Creation and implementation of a National Baccalaureate System (SNB) based on a Common Curriculum Framework</p> <p>Objectives:</p> <ul style="list-style-type: none">• Implement a set of minimum competency standards required by each track for the establishment of a common graduate profile.• Facilitate student transfers and equivalencies validated between careers and subsystems.• Enable a better understanding of the system by employers. <p>Results:</p> <ul style="list-style-type: none">• Upper-secondary schools assessment bodies registered and accredited.• Upper-secondary schools evaluated by assessment bodies to verify compliance with the requirements of RIEMS. <p>Persistent challenges:</p> <ul style="list-style-type: none">• Progress in implementation of RIEMS is expected to reach 60% in 2014. The reform is an ongoing process that needs to be continued.• Lack of incentives for key stakeholders to participate (e.g., teachers, productive sector representatives).• Lack of knowledge by teachers and students on the adoption of specific rules for transfers between programs of study, and infeasibility of its application in autonomous establishments.
<p>Low levels of quality of education and deficient job training skills.</p>	<p>Adoption of the Teacher training program (Profordems):</p> <ul style="list-style-type: none">• Teaching method modified: competency-based model adopted.• Teacher profile defined.• Competitive selection process for school directors implemented. <p>Persistent challenges:</p> <ul style="list-style-type: none">• Training programs conditioned to teachers' availability.• No recognition of training within teacher career ladder.• Limited number of institutions authorized to offer certification.
<p>Low percentage of students scoring above average in international assessments.</p>	<p>Adoption of a new student assessment of educational progress:</p> <ul style="list-style-type: none">• ENLACE and PISA standardized tests.• Independent test system implemented with the National Center for the Evaluation of Higher Education (CENEVAL).
<p>Mismatch between educational curricula and skills demand in the productive sector.</p>	<p>Efforts for matching educational supply with labor market demand:</p> <ul style="list-style-type: none">• Internships and workplace visits for students and teachers.


Higher Education

Overview and Current Status

Higher education institutions are a key element of the continuous learning model, because they can provide industries and regions with the kind of knowledge, services, and quality training needed to facilitate a constant upgrading of skills as well as access to technical assistance and research and development.

In Mexico, the higher education sector is well developed, with institutions operating in almost every state and with several high-quality universities conducting research that supports the economy. As of 2012, there were 4,894 higher education institutions in Mexico, of which 1,145 were public, 885 autonomous, and 2,864 private (SEP, 2012). These institutions serve approximately 2.9 million students (which represents 29.4% of the total population ages 19–23).

Despite the number of institutions, the sector was not closely aligned with the world of work until new initiatives began emerging in the 1990s. This was a bold move, as large autonomous universities tend to be somewhat rigid and not rapidly adaptable to changing needs of the productive sector. New institutions were designed to provide students with educational opportunities that are more aligned to specific local market needs and to provide local firms with better access to training and technical assistance services to improve their performance. They are equipped to stay current and offering services to industry; as a result, in some regions they have become the training provider of choice for foreign investors.



Degrees	Institutions
Advanced technician degree (Técnico Superior) - 2 years	Technological universities Polytechnic universities Technological institutes
Bachelor's degree (Licenciatura) - 4 years	Universities Intercultural universities Teacher training universities
Graduate degrees including specializations, master's and doctorate degrees (Posgrado) - 2 or more years, following bachelor's	Universities

In 1990, state technological institutes were established, following the federal technological institutes, and in 1991, technological universities were created offering two-year programs, similar to the French University Institutes and the U.S. community colleges. These two-year programs lead to associates degrees and are decentralized to the states.

In 2002, new polytechnic universities were established in 12 states, with the intention “to promote the innovative application of knowledge, to improve private sector performance and improve the links to regional organizations including the provision of technological services” (Brunner et al., 2008). During that same year, intercultural universities were introduced to support the objective of equity in higher education by serving indigenous communities.

While traditional four-year universities (which account for 88.9% of total enrollment) tend to serve large numbers of students drawn from dispersed geographical areas, the polytechnic universities and technological universities (3.8% of total enrollment) operate at the local level, and thus have proliferated as demand grows from both students and local industries. Between 2007 and 2010, 87 new polytechnic and technological universities were established (SEP website, 2013).

To ensure linkages between tertiary education and the needs of the private sector, new institutions and existing offerings are evaluated according to their alignment with regional economic development plans by the State Commissions for Higher Education Planning (Comisiones Estatales para la Planeación de la Educación Superior, COEPES), and by regional councils (Consejos Regionales para el Planeamiento de la Educación Superior, CORPES).

As is the case with technical upper-secondary education, the new technological universities and polytechnic universities set out to incorporate a competency-based approach and to adapt to local industry needs. While their success in achieving this varies, most of them have opted for benchmarking international standards. Their curriculum design methods follow the general guidelines of the European Tuning Structures of Higher Education, which is an approach developed in 2000 aimed at enhancing relevance and quality of higher education.¹⁹

Mexico's Polytechnic and Technological Universities offer two-year associate degrees with curriculum geared to the needs of their local labor markets.

One example of how these institutions ensure they are linked to employers in planning their educational programs is that of the technological universities. Alignment of the curriculum with the needs of the productive sector is supported through the use of Employment Situational Analysis (Análisis Situacional del Trabajo). The university president convenes representatives from across the sectors and industries operating in the region to identify the main characteristics of the professional career(s) to be offered and then to identify the professional competencies required. Industry experts lead the analysis and then pass on their recommendations to an academic group that transforms them into curriculum and designs the programs of study. If a competency standard is involved, a certification option is offered to students (Flores, 2012).

¹⁹ For information on Tuning, see <http://www.unideusto.org/tuningeu/>.

Study programs also foresee that students should spend one-third of their training in enterprises. Particularly, they should contribute to solving a firm-specific problem during their internship. For this, students work under the supervision of tutors who have been assigned by both their school and the firm. This shadowing opportunity seems to be an important step for graduates' labor insertion, as slightly more than 40% of graduates from technological universities declare that they found a job through their internship (Flores Crespo, 2005).

To track relevance of academic programs over time, each technological university has an Advisory Council that links the university with local industry (Consejo de Vinculación y Pertinencia). These councils monitor the academic programs, assess alumni performance in their jobs after graduation, and make recommendations as needed regarding adjustments of the curriculum to take into account specific opinions of employers and the labor market in general. Because of this close relationship with industry, the placement rate of alumni from the technological universities is about 82.5% in the first six months after degree completion (Flores, 2012).

Based on several diagnostics of the remaining challenges to strengthen linkages between these types of institutions and the productive sector, the Higher Education-Enterprise Foundation (Fundación Educación Superior-Empresa, FESE) was created in 2008. FESE plays an intermediary role among academic institutions, the government, and the productive sector. It seeks to articulate education supply with demand through a series of programs and services²⁰ aimed at increasing students' employability and their contribution to innovation, competitiveness, and economic development. The initiative has been recognized by the National Council for the Evaluation of Public Policies (CONEVAL), but its scale is still limited (each year, only 1,500 youth benefit from FESE's programs) and no impact evaluation has been done, apparently because of budget constraints (CONEVAL, 2013). It might be interesting to intensify this effort and evaluate its impact to enhance connections with the productive sector and the relevance of higher education.

The Mexican approach is similar to the career pathways and clusters approach in the United States, where educational institutions and workforce agencies work together at the regional level to identify skills and define a progression of competencies needed to be acquired through coursework to lead to a credential within a specific industry cluster (Hamilton, 2012). Each local region differs in the specific way in which it develops its career pathways, but generally speaking career pathways approaches refer to "an articulation of knowledge, skills and competencies which connect education with work in an occupation" (Hamilton, 2012, p. 9). Career clusters are groups of occupations and industries that have some common characteristics, especially in terms of the competencies required. Because clusters bring together employers and workers who benefit from the same types of skills, they make it more attractive for providers to focus on specialized skills, because there are cost efficiencies in provide training and greater incentives for trainees who can apply their skills at multiple companies within the cluster (IFC, 2013).

²⁰ The programs provided by FESE include internships, workplace shadowing, and a job bank for recent graduates. Employer associations and enterprises are the main partners, while representatives from technological institutes, technological universities, and polytechnic universities constitute FESE's Board.

Challenges

Mexico's higher education system is on a positive trajectory of increasing its coverage and enhancing its linkages to the productive sector, but more work is still needed in this regard. Results are mixed: The traditional higher education institutions are neither adaptable to adult continuous education needs, nor relevant as a service provider for employers or companies seeking technical support. While more adaptable, the newer community colleges are less restricted but need more development and know-how to reach their purpose and potential. The effectiveness of the COEPES system to ensure alignment of tertiary education with local labor market demand varies across states, and best practices need to be identified to strengthen the process in each region (Bruner et al., 2008).

The participation of adult learners is still limited within the tertiary system, as there are few offerings available outside the regular degree programs that would allow adults with experience in the labor force to continue their studies (Bruner et al., 2008).

The proportion of tertiary institutions that provide services to industry is still small relative to the more traditional public universities that do not offer this type of fee-based technical assistance and research and development services. Moreover, the associate degree of two years provided by technological and polytechnic universities and technological institutes still faces reputational challenges; industries and communities still perceive that these institutes do not provide a high-quality education option. The challenges are both to incorporate a wider range of return students into higher education while simultaneously helping align higher education, particularly in key employment demand areas, to curriculum, methods and work-based models based on productive sector growth. If strengthened further, these institutions have the potential to drive the current effort to promote worker productivity by increasing their role as a partner to businesses in promoting competitiveness. This would, however, require that they fortify their research and technical assistance capabilities.

Expansion of coverage is still needed. Mexico has one of the lowest percentages of its population with a tertiary education, as compared with other OECD countries. Only 22% of 25- to 34-year-olds, and only 17% of the economically active population overall (ages 25–64) have attained a tertiary degree, as compared to the OECD averages of 38% and 31%, respectively (OECD, 2012b). Similarly, a problem that has increased in scale is the number of students rejected by public higher education institutions. At least 10% of 19- to 23-year-olds who want to pursue their education are not able to get into the public university of their choice (Martí, 2013).

Even though Mexico has been growing its public expenditures on tertiary education, the country still spends less per student than other OECD countries, which is a challenge particularly because of the expansion of coverage. Between 1995 and 2002, public spending on tertiary education grew 72%, but enrollment grew by 42%, so the total expenditure per student grew by only 21% (Bruner et al., 2008).

Fostering greater dynamism through strategic investment in knowledge-sharing, research and innovation is another challenge for Mexico. Expenditure on research and development (R&D) represented just 0.44% of GDP in 2003, as compared to the OECD expenditure average of 2.5% and expenditure rates in Brazil of 0.98% (Bruner, 2008). Higher education in Mexico plays a larger role in R&D than it does in other OECD countries, reflecting the limited presence of the private sector. Most of the R&D that takes place at Mexican institutions is funded by special grants from the science and technology agency (CONACyT), and not from regular budgets, which are dedicated primarily to teacher salaries and school operation. In terms of coordinating research with the productive sector, a 2008 OECD study found that “the general opinion [in Mexico is that] tertiary education institutions in Mexico have, at best, very weak ties with the productive sector in general and with industry, in particular” (Bruner et al., 2008, page 24). Only 1.1% of higher education expenditures on R&D were financed by industry in 2001, which was one of the lowest levels in the OECD. Furthermore, countries like Korea have nearly 10 times more researchers relative to their population than Mexico (Jankowska et al., 2012).

Continual Skills Upgrading for Active Workers

A lifelong learning system needs to facilitate a continual upgrading of skills by individuals throughout their lives. This implies that active workers, as well as jobseekers, should have access to training opportunities throughout their careers.

In Mexico, the training of active workers occurs primarily through the Ministry of Education’s job training centers (Centros de Formación para el Trabajo) and vocational and technical upper-secondary and tertiary education institutions such as CONALEP and the new community college-type institutions, as well as through an array of programs under the purview of the Ministry of Labor and Social Protection. These public systems, combined with a concerted effort to increase work-based learning opportunities could make a difference in the overall skill levels of active workers, but they need to forge ahead with clear priorities and targeted strategies.

The main active labor market programs under STPS related to training of workers have their roots in the mid-1980s and are still relevant today, namely: (i) a program of stipends for on-the-job training to jobseekers, originally known as PROBECAT, Programa de Becas de Capacitación para Trabajadores Desempleados and operating today as Bécate; and (ii) a program aimed at enhancing in-firm training for the employed workforce, originally called the Programa de Capacitación Industrial de la Mano de Obra (CIMO), later Programa de Calidad Integral y Modernización, and ultimately Programa de Apoyo a la Capacitación (PAC) and Programa de Apoyo para la Productividad (PAP), which provided technical assistance and government cost-sharing to firms that engaged in training their workers. Despite the success of both programs, Bécate lacks coverage and CIMO/PAC lost momentum and ultimately its weight in the STPS agenda. For these programs to contribute effectively to the productivity agenda, they have to expand significantly in scope.

Job Training Centers

With an annual budget of about US\$195 million, the federal government subsidizes job training centers distributed throughout the country that offer technical training and have linkages with local businesses and offer specially tailored on-the-job training at the request of specific companies. In addition, the centers offer online education and a certification process through which workers complete a theoretical course and then receive a skills certificate that validates the acquired knowledge. There is little evidence, though, that the certifications these centers issue are required by industry or that these centers are subject to quality assurance guidelines.

Registration figures indicate that about 50% of their core client base are youth ages 15–24, many of whom have not completed secondary education, rather than active workers. The job training centers were created to provide the main source for adult center-based training in Mexico, but there are clear indications that this system is gradually losing its relevance as a viable training system that can offer relevant support to workers and firms that seek to upgrade their skills and knowledge to increase their competitiveness. A great part of the system is oriented to short-term training in less productive activities with more of a poverty alleviation approach directed to vulnerable groups than the provision of customized training to support enterprises that seek training for their active workers. Given the current policy agenda, it is vital for this system to reorient its focus to make business more of a primary customer and stimulate overall productivity.

These government subsidized job training centers have been participating in the recent education reforms and seeking to increase their connection and relevance to industry by actively seeking out key industries to establish training projects geared to meeting their specific needs. A recent review of these initiatives (DGCFT, 2013), however, demonstrated that they are still too scarce and small in scale.²¹

On-the-Job Training for Jobseekers

The Bécate program provides stipends, training, and job placement support to facilitate employment of jobseekers (who could be unemployed or employed but seeking a change or improvement in their employment situation). It is operated by the 163 National Employment Service offices. The program is key to a continuous learning model because it provides an opportunity for active or displaced workers to retrain for better jobs, and for first-time jobseekers to gain experience and skills that will increase their employability over time. However, Bécate is a small program within the context of Mexico's labor force, serving only about 200,000 beneficiaries annually, with a budget of approximately

The Bécate program provides on-the-job training for jobseekers, in close coordination with employers who provide the training and commit to hire a percentage of participants. Evaluations have found the program highly effective, but it needs expansion to exploit its potential.

²¹ The great majority of reach-out efforts have been focused on state-owned enterprises or government agencies (PEMEX, INFONAVIT, SECTUR, SEMARNAT, etc.).

US\$50 million. More resources need to be allocated to the program to capitalize on its effectiveness and maximize its impact.

Bécate's approach is based on training in the workplace, using on-the-job training in companies with identified vacancies directed primarily at youth ages 16–29. Under the program, employers provide the instructors, equipment, and materials, while the government funds the stipends, for one to three months. Bécate has two modalities. One is geared to medium and large companies, in which employers commit to hiring at least 70% of the participants at the end of the training period. The other provides on-the-job training in micro and small businesses. In this case, the public sector provides the instructor/monitor to deliver the training and does not require a vacancy nor imposes any obligation on the part of the employer to hire trainees. Both modalities have achieved very high placement rates.

Impact evaluations have demonstrated that Bécate is successful at placing beneficiaries in good-paying jobs.²² A 2006 evaluation of Bécate, which focused on data from 2000 to 2004 (when it was known as PROBECAT), confirmed that many elements of the program are achieving a positive impact (IDB, 2006). The report, conducted for the IDB's Office of Evaluation and Oversight, found evidence of a positive effect for salaried employment since the year 2002. For those who find jobs, participation in the program leads to a larger wage premium to participants than to nonparticipants.

A 2010 evaluation of Bécate found a positive impact on participant employment rates, income, and social benefits (van Gameren, 2010). The study found that participants had a 20% higher rate of job placement than nonparticipants one semester after graduation and a 15% higher chance of being employed than nonparticipants two semesters after completing the program (van Gameren, 2010).

The design of these Mexican programs that combine training with practical work experience is in line with many international best practices. The best practices for the design and administration of classroom training and on-the-job training include tight targeting, labor market relevance, high-quality content, small scale, and the valuable upfront link with an employer that is delivered when training includes an on-the-job component (Martin, 2000).²³ In addition, when workplace learning is oriented toward the development of cross-cutting skills that may apply for an entire industry, instead of for a specific job, better employment conditions tend to be present (ILO, 2013). One of the greatest strengths of the Mexican Bécate program is the upfront link with employers, who not only provide the training or arrange for it, but also pay for it.

²² Through the matching method, the evaluation showed positive effects on income, employment rates, and social benefits. Consistent results were obtained by applying the difference-in-differences method.

²³ For more research demonstrating the effectiveness of programs that combine training with practical work experience, see Puentes and Urzúa, 2010; González, Ripani, and Rosas, 2012; Hotz et al., 2000.

Co-Financing of Training for Active Workers

The core government program to support the training of active workers was the Program of Industrial Training for the Workforce (Programa de Capacitación Industrial para la Mano de Obra, CIMO), which operated (under distinct names) from 1988 until 2002, when it was redesigned and lost its effectiveness and consequently its budget. A current version of the program no longer prioritizes work-based training, and its budget is very small, so unless it is redesigned and expanded in scope, it has little chance of contributing to the country's effort to promote firm and worker productivity. CIMO was designed to improve the productivity by enhancing the overall performance of micro, small, and medium enterprises (MSMEs). This was done through technical assistance to firms in order to diagnose their overall performance and identify areas where they could improve their production process.

From the outset, CIMO was designed to create incentives for employers to invest in training by co-financing programs and equipping them to be able to define their priorities and related training needs more strategically. The program was decentralized to ensure that it could respond to specific training needs for enterprises at the local and regional levels.²⁴ Employer organizations participated in operating the program, and business chambers housed Regional Training Promotion Units (UPCs) on behalf of the program. These units were staffed by “promoters” who conducted diagnostics and acted as advisors to employers in developing the performance goals and related training plans. This collaboration between employers and promoters played a key role in the success of the program.

During the first phase, STPS absorbed about 70% of the training costs the firm would incur, while the employer covered the remaining 30% of the costs. Business associations offered their facilities and covered operating expenses to house the UPCs, while the program covered the salaries of the promoters.

In the early 1990s, CIMO was refined and became more comprehensive, based on the lessons learned in the first phase, which showed that: (i) companies needed an integrated program that included not only training but also support and technical assistance related to technology, organizational change, production, quality control, and marketing; (ii) the program could expand its scope by also supporting groups of enterprises in various topics and in areas of need common to certain industry branches; (iii) consultants who offered their services to the program had to undergo training and orientation to ensure they understood the systemic focus of the program; and (iv) the CIMO promoters should be trained in process analysis tools to better serve enterprise needs.

As the program became more solid and consolidated, the public-private share of financing for training and technical assistance changed progressively, so that by 2000, STPS and the companies were each covering 50% of the costs (with the exception of microenterprises, where STPS covered

²⁴ Research shows that most SMEs struggle to formulate their training needs unless the government equips or trains them with tools and mechanisms for doing so.

60%). More business associations joined the program, offering more facilities and more support to the UPCs. The share of firms that benefited from the program grew to 330,000, the number of UPCs increased from 30 to 72, and the number of workers trained rose from 84,000 to 734,000 (Flores, 2012).

The results of evaluations conducted in 1995 and 1997 helped to guide further program improvements. In comparison with control groups, both evaluations found positive impacts on intermediate outcomes. CIMO firms were more likely to provide training, invest more in training spending per worker, introduce organizational changes, and implement quality control systems, as compared to control groups (Tan et al., 2007). Positive program impacts on productivity growth were found in the 1991–1993 period, but no significant productivity results were found for the period of 1993–1995, possibly because of the effect of the economic crisis of 1994, or possibly because of problems with the control group selection (Tan et al., 2007).

Government support for in-firm training by SMEs through the CIMO program was found to have a positive impact in independent evaluations. The program worked best when coordinated by the private sector and included technical assistance as well as training.

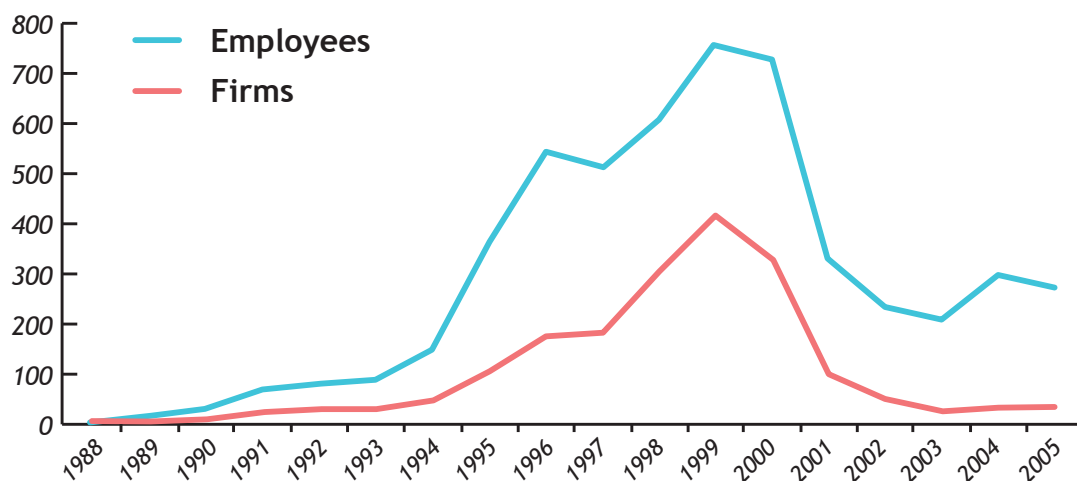
In 2001, the new government radically changed the CIMO Program. The key changes included: modifying operating procedures by adding regulatory paperwork to access the program; renaming the program Training Support Program (Programa de Apoyo a la Capacitación, PAC) and ultimately Productivity Support Program (Programa de Apoyo para la Productividad, PAP); limiting co-financing exclusively to training, thus removing the technical assistance component; shifting management of PAC to the state governments; renaming the UPCs the Training Promotion Offices (OPC) and removing them from the business associations and placing them instead under local government; and adding a new requirement that the participating companies demonstrate that workers receiving training were registered with social security (which excluded all informal firms that had previously benefited from the program).

In most cases, the PAC program was turned over to the STPS local Labor Delegations, which manage inspections and other regulatory and arbitration issues between employers and workers, thus creating a less business-friendly environment. Program authorities at the national level also introduced more regulatory requirements such as registration of training activities, which had no added value and were only an effort to comply with their regulatory function. These regulatory and bureaucratic burdens, combined with a significant reduction of promoters operating in the various states (from 250 to 87), diluted the broker role of the promoters over time.

These changes affected the perceived relevance and ease of use of the program on the part of employers; as a result, participation in the program declined considerably during the third phase: The number of workers trained fell from 734,000 to 280,000, the number of firms supported went from 330,000 to 34,000, and the number of OPCs from 72 to 69, with only 17 of these managed by private business associations. The fluctuation in the number of firms and workers served during each phase of the program, and the dramatic decline in the third phase, is illustrated in Figure 12.

With the program in decline, under its new configuration, it was discontinued in 2005. No similar program has been put in place to spur investment and training of active workers in the same way as CIMO.

 **Figure 12. Employees and Firms Supported by CIMO-PAC 1988-2005**



Source: Roberto Flores Lima, 2012.

Key lessons emerged from the experience with CIMO and PAC/PAP that could be applied to programs in the future, most notably the following:

- Training by itself is often not enough to improve enterprise performance. Design of training programs to improve productivity must be guided by a systemic vision of what firms do, the industry sector they are in, and the different kinds of support they need.
- Decisions about what services are needed must be based on a diagnostic of the firm's constraints, conducted jointly by process consultants and the owner and/or manager of the firm.
- The public sector need not deliver training itself; its role is to identify and match the best available public or private sector training providers to the needs of enterprises in the local area.
- Public-private cost sharing of training services, delivered primarily on a group basis to enterprises, can be cost-effective for serving microenterprises.
- Involving business organizations in management of programs is an effective way to integrate public policies with the needs and interests of the private sector.
- The broker role of the promoter is critical to ensure that the best interest of the firms is being contemplated in the analysis of their technical assistance and training needs and in the formulation of their plans.
- The creation of the right incentives for the participation of the private sector is vital. In this regard, maintaining the business approach is vital. Employers need to perceive the government as a facilitator instead of a regulator in order to keep their business interest in this type of initiative.

Challenges

While improvements in the formal education system are important for providing the right skills to new entrants and jobseekers, the right opportunities for active workers to update their skills continually is essential for a lifelong learning framework that will help improve the competitiveness of the current workforce and also ensure its competitiveness over time. Over the years, Mexico has implemented a number of positive active labor market policies and created programs that have proven effective. However, the current mix of programs geared toward active workers is insufficient to meet the needs of the large workforce.

The job training centers, which provide the main source of education outside the workplace, have traditionally been slow to respond to market trends. Their recent efforts to enhance linkages to the productive sector are positive, but need to be expanded. The Bécate program for jobseekers has proven effective, but its coverage is so low that its impact is practically meaningless considering the size of the Mexican workforce (Bécate only reaches 0.004% of the workforce). Equally worrying, with the discontinuation of CIMO, micro, small, and medium-size enterprises (which employ almost 80% of the total workforce) were left without a strong government program supporting increased investment by employers in the training of their workers.

Informing Lifelong Learning Choices with Labor Market Information

Overview

Lifelong learning by its very title implies that decisions are made for education, short-term training, skills certification, work-based learning, taking into account both individuals' own preferences/skills for careers and knowledge about where future jobs are (e.g. salary trends, location). As workers seek to upgrade their skills and ensure they acquire the skills demanded by the productive sector, access to reliable labor market information is critical to a long-term learning model. One of the values of Mexico's labor market information system is that it organizes information along career paths to assist jobseekers in making decisions about the progression of their careers. Mexico has the region's leading labor market information system in its Labor Observatory (Observatorio Laboral), which was initially launched in 2005, with a new generation launched in 2012.

Reliable labor market information is critical for workers as they acquire and upgrade their skills, to ensure that they seek the skills employers need.

The objective of the Observatory is to provide occupational profiles and forecasts, using a national catalog of occupations (Catálogo Nacional de Ocupaciones) and the national employment survey (Encuesta Nacional de Ocupación y Empleo, or ENOE). The Observatory provides users with information on potential career paths and links to the employment service and its online job bank (Portal de Empleo).

The information is available through a website that provides free information focused on the leading careers and professions in Mexico. The Labor Observatory website, managed under STPS, is one of the most frequently visited websites of the federal government, having received more than 3.7 million hits since 2005. Mexico has set up a system similar to that of Canada, where there are direct links between the labor intermediation services and labor market information, collected with methodological consistency.

The Observatory currently tracks indicators for 62 professional careers, 34 technological careers, 20 technical careers, and 240 occupational groups (World Bank, 2013a). Visitors to the site can view data organized by career or occupation, including numbers of people employed, average incomes, employment trends, breakdown of women and men employed in that career or occupation, and average schooling of employees. The website also provides general information on employment trends in the country and tips for job searching and links to a range of job openings.

Another increasingly useful instrument of labor market intelligence is the use of employer surveys that assess training needs and trends. The aim of these surveys is to investigate changing skill requirements of enterprises, sectors, and occupations, and assess what drives the differences. For a period, Mexico had such a survey (conducted by INEGI from 1992 to 2005), ENESTyC (Encuesta Nacional de Empleo, Salarios, Tecnología y Capacitación), which had national representativeness (more than 9,000 establishments). The survey analyzed rich information on training needs and investments, technology, wages, employment, forms of labor contracting, and internal plant organization. It also provided useful information on competitiveness and its related factors as well as employer skills requirements. Despite its benefits, the survey was discontinued in 2005 because of high costs.

Challenges

The Labor Observatory currently plays an important role in the continuous learning process by providing a snapshot of how the labor market is currently behaving. The next step for the Observatory is to make it a bona fide observatory of the future. Its support to learners could be enhanced in the future if it also provided information on future trends, skill shortages and gaps, as well as information on employment levels. In addition, the Observatory could be enhanced by calculating statistics at the state and regional levels, which would provide more richness of detail than the current national statistics. That would allow both the industry and education sector to increase their capacity to develop the evidence base for policy making and to improve systemic coordination between existing experts in the field.

Expanding the actual use of the Observatory is another challenge. More could be done to link the Observatory to secondary and tertiary schools and encourage greater use of the tools it provides. Moreover, the Observatory and other labor market intelligence instruments need to inform the overall policy-making process. Increasing labor market knowledge at this important juncture is a worthy investment to support the design of long-term strategies and orient investments in education and training.

Coordination with the Productive Sector

Overview

The Mexican government has come to understand that the transformation of the technical education and training system into one that is capable of responding to the dynamics of local industries is vital to the creation of jobs and the improvement of the productivity and overall economic competitiveness of the country.

The essential ingredient to ensure relevance and adaptability of the lifelong learning framework is the collaboration between the productive sector and education and training.

Mexico has developed several cases of successful private-public collaboration schemes that have demonstrated the potential of such approaches. Innovations in this regard within education and training institutions include, as discussed earlier, the Trayectos Técnicos of CONALEP and the efforts underway by the public job training centers and upper-secondary schools to increase coordination with local employers.

An example worth highlighting, which piloted a systemic human capital development approach, took place in the region known as the Riviera Maya, where Mexico has attracted considerable international investment in the tourism sector, and where there is strong demand for workers with adequate skills. The initiative brought business representatives, training providers, and policy makers to the table. These public-private collaboration schemes are reorienting traditional vocational education and training towards tourism sector needs, providing workplace-based learning in hotels and linking the sector better to the national employment service. The Riviera Maya model has been identified as one of the most significant efforts in Mexico to make the training and education system more responsive to the industry's needs, specifically regarding prioritized sectors with growth opportunities, such as the hospitality sector, which represents 9% of GDP and is the third largest source of income, creating 2.5 million jobs per year.

The aim of the project was to develop a responsive training system adapted to the competitiveness and growth strategies of the sector. It accomplished this through the interventions of the Hotel Association of the Mayan Riviera and through dialogue with training suppliers and individual human resources managers from several participating firms. The most important changes that have been implemented in the region are: (i) change of educational orientation and organization aligned to industry needs; (ii) change of locations and schedules aligned to the working schedules of professionals within the industry, promoting more work-based learning and adapting staffing needs of schools to a more flexible model; (iii) adaptation of pedagogy to align with actual work processes and the occupational roles in the productive sector through the workshop concept and use of professional equipment; (iv) up-scaling of industry trainers to adapt to scope of demands; and (v) rotation of teachers through enterprises to learn firsthand the competencies required by the productive sector and update their teaching methods accordingly.

In addition to reforming the training supply to align to the needs of the tourism sector, the government also initiated dialogue with other strategic sectors in the Mexican economy that are also



Box 8. The Riviera Maya at a Glance

The Riviera Maya is one of the most important tourist destinations in Mexico, with an inflow of almost 4 million tourists in 2012. It is located in the 120-km stretch of coastline along the Yucatan Peninsula from Cancun in the north to Playa del Carmen, Tulum, and Chetumal in the south. Before the growth of the tourism sector, the coast was characterized mainly by small fishing villages with a sparse population. The past few years have seen the birth of numerous all-inclusive resorts and boutique hotels in the Riviera, a testament to its flourishing tourist industry and thriving economic growth, a trend that is foreseen

to continue. Economic revenue in the region exceeded US\$2 billion in 2012. Projections made by the Association of the Hospitality Sector in the Mayan Region show that the sector is estimated to grow from 38,000 rooms in 2010 to 80,000 rooms in 2030. According to hotel sources, the number of jobs per room varies, depending upon the level of service intensity, from 1 to 1.7 jobs per room, with the majority of them at the operational level. For each job created within the hospitality sector, the Ministry of Education estimates that an additional 14 jobs are indirectly created.

marked by pressures to raise skills levels in a substantial way, such as the automotive, sustainable energy, information technology and communication, software, and construction sectors. The purpose of the dialogue is to obtain deeper insight into the industry dynamics and the competitive strategies as the point of departure for aligning the curriculum in different parts of the technical upper-secondary and professional systems to the industry needs.

Challenges

While efforts at public-private partnerships are expanding in Mexico, to date only the experience in the Riviera Maya effectively links with employers in a systemic way; the experiences in other regions are somewhat ad hoc, occurring as needs arise and are less systemic. More needs to be done to consolidate and deepen these partnerships on all fronts. Public resources need to be channeled to leverage and sustain employer involvement.

Mexico has made important strides in public-private partnerships to ensure that skills development matches the needs of employers. These efforts need to be expanded and this will require public resources to leverage and sustain private participation.



Chapter IV

RECOMMENDATIONS

Guidance for Mexico from International Best Practices

There is little debate over the new direction needed in Mexico towards lifelong learning as a central feature of a more productive and more prosperous Mexico. How to create such systems from the inadequate institutional bases that now exist requires some big picture thinking and big picture changes.

As a framework for considering recommended paths for Mexico to pursue, we look at the key characteristics of the countries that have fairly well-developed skills development systems and are doing the best in terms of preparing youth to enter the workforce and facilitating lifelong learning for their workforce. These countries,²⁵ are facilitating skills upgrading of their existing workforce, are supporting youth to achieve academically at higher levels, are keeping youth in school, and are structuring the transition from school to work so that everyone has training for an initial career and enters the workforce smoothly. Some of these experiences demonstrate in a compelling way that it is possible to become a knowledge economy in less than a generation by crafting a human capital strategy to fulfill future-based economic goals.

International literature suggests that effective models and practices in the successful countries include the following:²⁶

1. **VISION:** They started with a vision of the path they wanted to follow and developed a strategy that could deliver on that vision.
2. **A NATIONAL PROCESS:** They operationalized that strategy through a concerted national effort to bring all stakeholders to the table.

²⁵ Countries that seem to be doing the best job in terms of education outcomes and labor productivity include Germany, Switzerland, the Netherlands, Australia, United Kingdom, Ireland, Singapore, and South Korea.

²⁶ For a review of international best practices in skills development and TVET systems, see Aring, 2013; Cuddy, 2010; Hoffman, 2011; ILO, 2011; Kuruvilla et al., 2001; and Manipal City & Guilds, 2012.

3. **GOVERNANCE:** They created an independent workforce development agency, with statutory powers to calibrate supply and demand of skills.
4. **GROWTH POLICIES:** They aligned education policy to their economic agenda and designed education and training reforms within a broader context of a national growth and productivity strategy.
5. **SKILLS STANDARDS:** They created qualifications/skills standards systems covering the majority of occupations and often suboccupations, in a framework that standardizes and designates levels of competence.
6. **CAREER DEVELOPMENT WITH LENS TO THE FUTURE:** They have implemented effective career guidance systems, based on labor market intelligence, that act as a clearinghouse, informing jobseekers and employers.
7. **INCENTIVES:** They have put in place the right mix of incentives to encourage training.
8. **RESULTS-ORIENTED APPROACH:** They use international benchmarks to guide their progress and reorient their policies.

Although most of these countries are not comparable to Mexico in terms of population and resources, they do provide helpful insights for Mexico as the country works to consolidate and refine its own lifelong learning framework to foster a smooth school-to-work transition for new entrants and contribute to the increased and sustained productivity of its workforce (for a country comparison between Mexico and some of the most successful countries in terms of key economic and skills development indicators, see Annex 1).

The sections below summarize specific recommendations for Mexico in each of the areas listed above that emerge as common practices among successful countries, noting where Mexico has already made progress and where additional work is needed.

VISION: Adopt a Strategic National Growth Vision and Productivity Strategy

Mexico's economy competes with many others (mainly Brazil, India and China, but also South Africa, Indonesia, and more and more countries from Latin America). Factor advantages based on geographic location are not enough to build a lasting source of productive performance and GDP. To increase its growth and productivity, Mexico has to undergo a serious transformation that exceeds the scope of education, training, and labor institutions. The development of a coherent lifelong learning framework presents a unique opportunity for Mexico to learn from other countries and, like them, develop a compelling and strategic vision for its future and enga-

Integrate lifelong learning with policies related to the country's economic development, growth, and productivity.

ge key stakeholders in the process of owning the vision and being accountable for turning it into a strategy. Mexico's vision should look forward at least two decades.²⁷ With this vision in mind, the country can then plan how to get to that future from the present with the right economic and human capital strategy. It is pivotal that implementation of both the economic growth and the workforce development strategies be synchronized, because productivity, education, employment, and economic development concerns must be linked, with all pointing to the same result. The vision should be as specific and measurable as possible. This will require that planning instruments be enhanced. Mexico's Development Plans contemplate six-year intervals. The vision requires a nonexpiring roadmap that orients future action and is built around consensus among government, states or regions, business, and labor. The fact that various and diverse institutions are all working in the same direction as part of an overall long-term economic plan enables different heads of government to see the wider relevance of their work and provides an underlying anchor for their efforts (Kuruvilla et al., 2001).

The case of Singapore is illustrative. In the late 1960s, newly independent and surrounded by much larger countries, Singapore set out to develop its first national vision. Aware that they had nothing but people on an island, the country's leaders visited a number of countries to benchmark indicators they wished to adopt. Switzerland became a reference, as it had the highest levels of development (in terms of per capita income, standard of living, and education, among other indicators). The 30-year plan developed by Singapore aspired to reach Switzerland's numbers in these key indicators. By the late 1990s, Singapore had surpassed some of the original Swiss benchmarks (Aring and Corbitt, 1998). Studies of the Singaporean experience note that there has been a tight "coupling" between its economic development strategies and skills development policies in order to provide the skills necessary for each phase of development, focused mainly on attracting foreign direct investment (Kuruvilla et al., 2001). Singapore's current national strategy was adopted in 2008 and is embedded in a national framework with key strategies to reach a set of specific development goals by 2030.

Another worthy example of a vision-driven development process is that of Ireland, where the country used foreign direct investment as a driving force to overcome serious unemployment and high emigration rates. Ireland adopted a proactive and selective approach to economic growth, with a 20-year perspective to move the country from a low-skilled to an advanced economy. An independent council was formed, the Irish Development Agency (IDA), which identified high-growth market niches in which the country could provide a reasonably competitive base. A key aspect of the Irish strategy was to identify strong companies operating in those niches that might be considering diversifying their production internationally (Ruane and Görg, 1997). Ireland also developed a cascade of human capital strategies to ensure that it had a skilled workforce to meet the skills requirements of foreign companies. The country's leaders strategically aligned their ministries behind the goal of becoming world leaders in the sectors identified. Ireland's economic strategies are renewed periodically to make sure they take global trends in account. Realizing

²⁷ The literature of growth and skills strategies considers short-term plans for the next 5–7 years and long-term visions that should cover the next 10–20 years, especially because they involve policy changes that need time to mature and bear concrete results.

that companies will locate where it is easy to do business and find the best workforce, Ireland now brands itself as “Team Ireland.” The brand sets Ireland apart, giving it a strong advantage over other countries. Demonstrating that its ministries work collaboratively with each other and with the private sector and higher education was key (Aring, 2013).

Perhaps one of the most significant examples is that of Korea. In 1962, GDP per capita was the lowest in the world, so Korea decided to adopt a development plan centered around an export-led strategy aimed at making the country economically independent (Kim, 2014). Throughout the years, it modernized its industrial structure and social structure to ensure that the benefits of economic development would improve the well-being of the overall population. Despite the fact that economic plans were time-bounded for five years to facilitate monitoring and adjustments, the vision of what the country wanted to accomplish followed a long-term rationale. The strategy rendered great gains, with its GDP per capita level multiplied 32 times over a 48-year period (as compared to a ninefold increase within 170 years in England and a 14 times increase within 57 years in Japan. See Kim, 2014). Initially, there was almost no awareness among employers about the importance of training in this transformation; however, the government recognized that industrial expansion, which in turn would lead to an increase in labor demand, would require a revamping of education and training. It was clear that human resources development tends to take a long time, so it should be pursued in parallel with industrial development. Korea designed and put into action a vocational training system to fit the new skills requirements of its economic development plan. Many adjustments were made to the education system and the overall training system as the demand for skilled workers started growing. The government’s supervisory role in supplying a skilled workforce was divided between different government agencies according to skill level. The Office of Science and Technology was responsible for managing the research and development workforce, the Ministry of Education for three-year formal skills training for educators, and the Office of Labor for short-term vocational training aimed at cultivating skilled general workers (Korean Ministry of Employment and Labor, 2012). The system revamped significantly in response to changing economic development strategies, but its basic structure and features remained the same through the years.

In Mexico, a lot has been discussed recently on the role of industrial policy—à la Ireland—to rescue certain sectors, consolidate others and explore new branches of growth, attract investment (foreign and domestic), and strengthen comparative advantages. Ripe sectors in Mexico include automotive, tourism, electrical appliances manufacturing, construction, and mining. Additional sectors with potential include IT, renewable energy, R&D in bio and nanotechnology, and creative industries. Focusing on these sectors as part of a medium- or long-term economic strategy, with linked education and labor policies, would allow the country to follow clear development pathways, because efforts would focus on those areas that are able to gear more dynamism and innovation, and more sophisticated value chains. It is important to note that not all these sectors might benefit from a targeted skills development strategy. It is thus appropriate to capitalize from those already engaged in human resources development practices, where investment will make the greatest impact. More work is needed to strengthen the sectors themselves so they have better assessment tools, organization schemes, and articulation with other stakeholders, among other things. Employer organizations in Mexico need to build analytical capacity to be a strategic partner in this effort.

A NATIONAL PROCESS: Involve Relevant Stakeholders in a Concerted National Effort

In knowledge economies characterized by rapid change and innovation, stakeholders are mutually interdependent and must hold each other accountable for delivering their part of the strategy.

Although in Mexico the government has primary responsibility for pre-employment education and training while employers are responsible for further training, a sustainable lifelong learning framework needs leadership and the benefit of a series of collaborative schemes that secure active engagement of all social partners. As mentioned above, this aspect has been a key feature of successful workforce development systems in other countries and is essential to enable all demand- and supply-side institutions to "sing in tune with each other." This is a process that involves clear identification of the different views of various institutions, discussions and iterative alignment of views to produce a unified direction, and finally, consistent actions by all the parties toward maintaining the relevance of skills for the industry.

A sustainable lifelong learning framework needs leadership and the benefit of a series of collaborative schemes that secure active engagement of all social partners.

This concerted national effort requires choreographed action among: (i) federal and state governments and business; (ii) multiple government agencies; (iii) different enterprises and/or business associations within a single industry; and (iv) labor representatives. If all actors seem to agree on the importance of a quality workforce to the success of a national economic development strategy, a whole network of agents can focus efforts on establishing competitive sectors within the economy. Networking, or clustering, of employers within a sector, but also of different stakeholders within the system, facilitates collaborative working relationships that are based on sharing knowledge and that distribute the benefits of having access to a pool of knowledge, which is often the source of local innovation and can lead to a virtuous cycle of development.

Recent literature (CEDEFOP, 2012) has introduced the notion of a "skills ecosystem" to refer to the interaction among all actors within the skills development system in contributing to the accomplishment of a comprehensive workforce up-skilling strategy. Whereas the ecosystem should exist at the highest level to ensure that the skills strategy is part of a broader national policy, at the sector level ecosystems replicate to narrow down the roles and responsibilities of each actor involved. The German experience in the medical technologies sector cited in Box 9 and further illustrated in Figure 13 reflects the conjugation of efforts in which the skills base played a central role.

This is especially challenging in a country as diverse, vast, and complex as Mexico, but not impossible. Perhaps incentive structures should be applied to engage public and private institutions in this new dynamic. State governments are in a position to contribute to and co-finance federal initiatives. Arrangements such as co-financing and co-participation—which already exist to a certain extent—supported by a national framework and standard guidelines could bring more coherence to the current lifelong learning system.



Box 9. The German Medical Technology Skills Ecosystem

The government decided not only to invest in research and development in general, but created research institutes that specialized in medical technologies. It supported universities in creating special courses for medical technology engineering, and it founded full-time vocational schools for medical technology technicians to promote specialization at higher intermediate levels, the Meister qualifications in particular.

Companies invested in apprenticeship training as they traditionally do in Germany; modern types of apprenticeship such as “Mechatronics” helped to meet skill needs in the sector. However, they realized the rather weak position of most SMEs regarding investments in human capital. The state government came in and not only financed the

school-based part of apprenticeship training but also took on all the costs of higher-level vocational training.

These adjustments to the traditional model helped create a highly fluid labor market, where companies exchanged staff and improved labor allocation. This was supported by the creation of 17 regional clusters that serve as exchange forums among the companies.

Companies also profited from the broad supply of labor-skilled workers in manufacturing and business-related occupations. As the skills supply increasingly became a network-based infrastructure, both the risks and the costs of poaching decreased. Under these conditions of a strong skills supply, workers who leave the company can easily be replaced, which thus lowers overall adjustment costs.

Specific policy actions in this regard include: (i) promotion of a sector-based and industry-led approach to skills development; (ii) public-private partnerships, including joint delivery of training and workplace learning opportunities; (iii) development of joint industry and skills forecasting mechanisms, as a basis for priority setting and constantly aligning initiatives to meet strategic goals; and (iv) job rotation of leaders from all government, productive sector, education, and labor unions across institutions involved in the system.

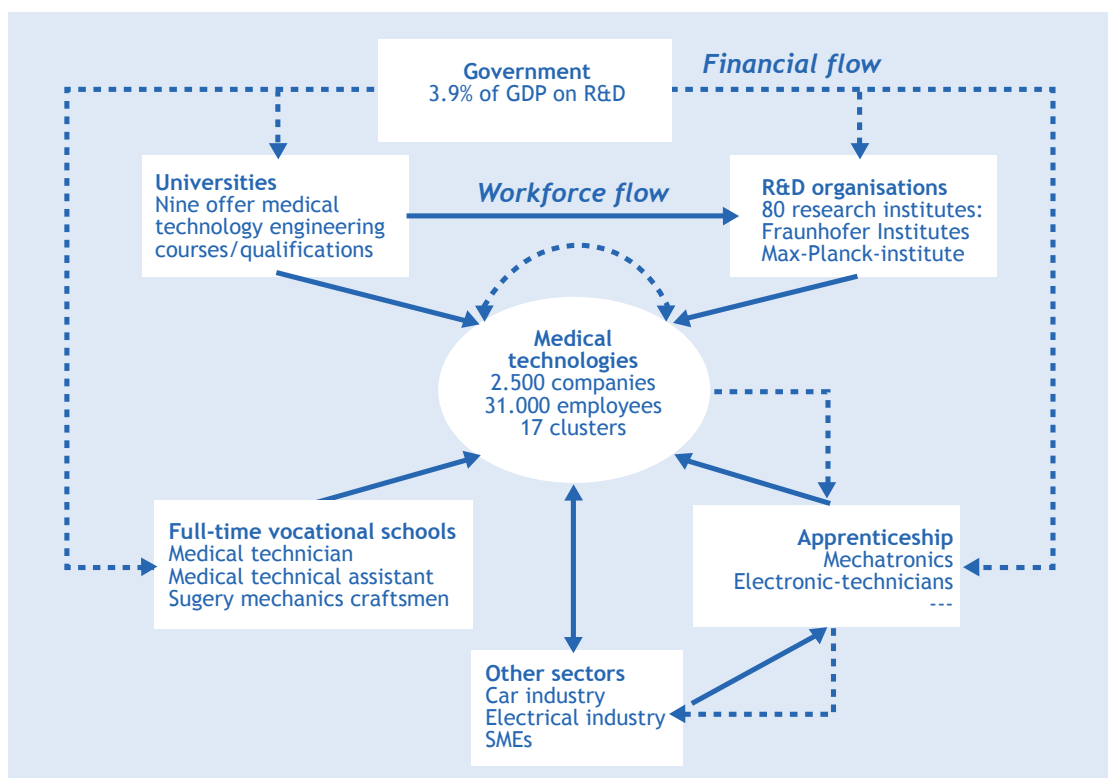
Research on public-private partnerships has identified four sectoral models for employer engagement: (i) the employer-involved model, in which policy makers invite employers to voluntarily engage in dialogues about skills, which sometimes include the legal obligation for employers to finance training in their sectors; (ii) the employer-owned model, in which employer associations and other representative groups define skills and finance training; (iii) the employer-modeled

model, in which there is peer-to-peer learning by employers about skills development; and (iv) the employer-driven model, in which the public VET system is run according to needs defined by employers or in which employers participate in private partnerships to identify skills needs and to finance training (Manipal City & Guilds, 2012).

The key under any model is to achieve the right balance between employer interests and government policy objectives, while at the same time also assuring a role for other stakeholders including unions, social partners, and training providers (Sims, 2013). Employers are the most important stakeholder when defining workforce demand, but they are not the only stakeholder, and all interests must be addressed. Hence the importance of implementing collaboration schemes across government agencies. Despite the fact that having people who have different profiles and experience working together might bring different expertise and visions, the ultimate goal is to preserve the strategic vision.

Building these sorts of alliances is not without challenges. Care needs to be taken in designing and promoting the type of partnerships that can effectively expand lifelong learning opportunities. They require trust and their benefits tend to materialize in the long-term. Furthermore, prospective partners have each different missions and priorities, and therefore it is crucial to develop a strategic vision that is acknowledged by all stakeholders, so that each can be clear from the start on the common goal and each player's expectations from the collaboration.

 **Figure 13. A Sectoral Skills Ecosystem**



Source: CEDEFOP, 2012.

Mexico has shown progress in this orchestration effort to be inclusive of social partners. In 2012, the government signed the Pacto por México, a political agreement between the elected President and the main political parties, which aims to introduce a series of structural reforms. In parallel, the productive sector and civil society organizations presented Ciudadanos Pacto por México, an alliance that gathers all groups from civil society and employer organizations and expects to become a counterweight in the design, instrumentation, and evaluation of public policies. These are important first steps, but if Mexico were to adopt a growth strategy like the ones described above, the challenge would be to operationalize the necessary initiatives and collaboration between institutions—without overburdening them with unnecessary restrictions—to achieve the long-term goals.

GOVERNANCE: Define a New Governance Mechanism for Workforce Development

The more successful countries created a politically independent human capital development policy framework and independent agency that coordinates the work of different industry councils to identify demand for current and future skills. These types of agencies also calibrate the supply of skills with the relevant education institutions. They have statutory powers in order to assure coherence of policies across government agencies, the suppliers of education and training, and productive sector needs. Most of the time, they depend on tripartite boards that bring the government, the productive sector, and labor unions to the table.

Designate and finance a national institution with a tripartite board overseeing a rigorous research and policy think tank with a mandate to inform economic, labor, and education policy.

For instance, the Singapore Workforce Development Authority (WDA) was created in 2003 under the Ministry of Manpower, “with the clear mission to lead, drive and champion workforce development, enhancing the employability and competitiveness of the workforce” (WDA website, 2014). Among its main functions are strengthening the continuing education and training infrastructure and supporting Singapore’s labor needs by ensuring that the workforce remains competitive to meet the changing needs of the economy. It works in tandem with organizations such as industry groups, unions, employers, economic agencies, professional associations, and training organizations to identify skills gaps, develop continuous education and training frameworks, define financial incentives, and set up training programs and schemes aimed at building a trained and skilled workforce.

Great care was taken to ensure that the WDA governance structure incorporates key stakeholders in the system as a mechanism to assure the convergence of all actors that can bring perspective to the process. It works with targeted industries such as tourism, health care, retail and business services, manufacturing, and construction. Each industry group is serviced by the WDA’s frontline divisions, which are further assisted by eight core services divisions that provide support that cuts across the industries.

Australia's Workforce and Productivity Agency (AWPA) is a similar endeavor (See Box 10). AWPA is an independent statutory body that provides advice to the Australian government on Australia's current, emerging, and future skills and workforce development needs. It provides advice on a broad range of areas that affect the demand, supply, and use of skills; recommends priorities for the Australian government's National Workforce Development Fund; and recommends ongoing reforms to the tertiary education sector, while providing advice on the impact of recent policies, such as demand-led funding.

In the case of Ireland, labor policy is driven by the Advisory Board for Enterprise, Trade, Science, Technology and Innovation, known as Forfás, which operates under the purview of the Department of Jobs, Enterprise and Innovation. Its key functions are to provide independent and rigorous research, advice, and support in the areas of enterprise and science policy, ensuring coherence of policy across development agencies; evaluate enterprise policy interventions; and provide research and administrative support to independent advisory groups such as the National Competitiveness Council, the Expert Group on Future Skills Needs, and the Advisory Council for Science, Technology and Innovation.

Although Mexico is a much larger country, with the inherent complexity that comes with size, there is the potential for Mexico to define more clearly a similar role for a national agency to play a leadership role in the definition of emerging skills needs of the workforce. Currently, in Mexico, different government agencies contribute to workforce development initiatives, but lack the benefit of an agency that can bring strategic coherence to the system. The existing agencies are more advanced in focusing their efforts on employer demands than agencies in other countries in the region, but they do not speak to each other nor make sure that their efforts respond to a wider national human capital development strategy. The fact that they are located under the purview of different ministries also complicates their alignment to a single cause, as each one depends on different resources, technical capacity, and priorities.

There is a clear need for an agency that can orient, leverage, and bring the coherence required to effectively develop a skills development system in the country. Such an agency does not exist in Mexico. The current Skills Standards Board is equipped to support the identification of standards but falls short of being equipped to lead such a process, and it would not be appropriate to expect it to play that role. The more successful countries have demonstrated that a separate, independent agency or authority is required to perform these functions. However, it should be noted that, in order to avoid the risk of creating an agency that would add complexity to the system without achieving the expected result, all mechanisms, processes, and rules should be in place, to make sure this authority is empowered to fulfill its mandate.

Following the examples from Singapore, Australia, and Ireland, such an agency would bring relevant stakeholders to the table, including key employers and unions, business and skill development experts, researchers, and government representatives. It should also have the resources to conduct research and have the political weight to inform education, labor, and economic policy. It could follow the rationale of a consortium, responsible for conducting in-depth analyses of specialized occupations to advise whether skill supply is adequate and where other incentives to



Box 10. Integrator for the Entire System: Australian Workforce and Productivity Agency

The Australian Workforce and Productivity Agency was established in July 2012 to prompt greater collaboration among industry, providers, and government on all workforce development issues. While very new, AWP replaced and expanded upon Skills Australia, set up in 2008 to provide independent advice to the government on workforce planning and industry skill requirements.

Skills Australia was widely respected and did important research on skills and training. But the government had been hearing from different stakeholders that they needed better collaboration mechanisms and tighter linkages between skill funding and industry needs. AWP, thus, embraced not only Skills Australia's responsibilities but also took on new roles in funding and coordination.

AWPA focuses on several key functions:

- It administers a new National Workforce Development Fund to deliver training for high-priority industries and occupations.
- It develops and monitors workforce development plans in conjunction with the 11 Industry Skills Councils. There was previously no entity formally responsible for playing this role.
- It conducts research on current and emerging skill requirements across all sectors.
- It provides independent advice to government and other entities—for example, AWP developed a national workforce development strategy in 2012.

AWPA's expanded mandate is designed to give it better and more strategic oversight of the entire education-to-employment system.

stimulate the supply and demand for, or use of, skill may be required. It could similarly be responsible for devising and promoting industry strategies to underpin workforce initiatives. The newly formed National Productivity Committee might be able to promote the creation of the proper institutional mechanisms and development of these capabilities. The goal is to ensure that workforce development is linked to the needs of the sectors already growing, as well as the sectors with potential, and to the new directions that the country should pursue.

GROWTH POLICIES: Align Education Policy to an Economic Growth Agenda

Coordination is crucial to link skills development effectively with employment and productivity growth. The education system should work together with other skills development institutions to ensure that educational contents remain relevant to market needs and that there are sufficient numbers of workers with the desired level of skills for industry requirements.

Educational content needs to remain relevant to market needs and the education and training system should ensure sufficient supply of skilled workers to meet industry requirements.

Most of the cited countries have developed medium- or long-term strategies to up-skill their workforce. Some of them, as in the case of Singapore, embed their skills development strategies within a wider growth plan. Others develop specific skills strategies as a starting point to establish a mechanism for debating and reaching agreement on the required skills and systems to drive productivity and better coordinate and communicate work across government and the social partners (See Box 11). These plans are conceived and developed independently from any administration and provide a roadmap to undertake the necessary reforms to strengthen the lifelong learning framework, mainly through TVET systems.

Box 11. National Growth and Skills Strategies from Abroad

Country	Strategy
Ireland	Tomorrow's Skills: Towards a National Skills Strategy
Singapore	A Lively and Livable Singapore: Strategies for Sustainable Growth
Australia	Future focus, 2013 National Workforce Development Strategy
New Zealand	New Zealand Skills Strategy

While laudable efforts have been made to align Mexico's training, technical education, and active labor market policies to fit new economic demands, the better practices in Mexico currently seem to be concentrated in the upper-secondary and postsecondary technical education systems. Through RIEMS, Mexico has made important progress for the upper-secondary education sector, and should continue its implementation. In particular, areas to emphasize going forward include initiatives that link vocational education and training to the demands of the productive sector and that connect students with exposure to the world of work. RIEMS covers only upper-secondary and part of the public training system; a pending issue is to strengthen the vast postsecondary system. It is time to widen the lens and to build a more finely articulated pathways system—one that is richly diversified to align with the needs and interests of today's young people and better designed to meet the needs of a modern economy.

In this regard, Mexico's reform path needs to continue to consider the following: (i) increasing inte-

rest among youth in technical pathways; (ii) linking curriculum to market needs; (iii) connecting youth to the workplace; (iv) actively engaging employers in program planning and implementation; and (v) supporting professional development of teachers and collaborative exchange between schools. Each of these areas of action is discussed below.

(i) Increase interest among youth in technical pathways

Mexico has already achieved an enrollment of about 40% of its upper-secondary students in technical programs. But much more attention and resources need to be focused on raising awareness among youth that technical jobs are better paid than other jobs. Studies show general academic upper-secondary education has limited effect on income returns until students reach higher education (Campos et al., 2012), whereas technicians coming from the technical upper-

secondary schools command higher salaries than those who graduate from the general academic track (Labor Observatory data). Best practices from countries like Switzerland show how lending prestige to technical schools and increasing awareness of the advantages of opting for technical careers reduces stigma of technical education. Swiss technical schools have partnered with leading companies not only to open learning opportunities for students, but also to provide better career information to students to help orient their career choice early on (Hoffman, 2011). Enterprises like Swisscom have helped convey the message that certain technical careers offer interesting returns, which make graduates feel more respectable, more empowered and more self-satisfied with their profession.

Encourage youth to pursue technical pathways by disseminating research on the job opportunities and income potential from technical certificates.

(ii) Link curriculum to market needs

Mexico made an impressive attempt to create a national framework that would articulate education with an overall competitiveness agenda, which began over two decades ago. It has a good base from which to build and continue to increase the role of the productive sector in decision making, including budgetary decisions. On the upper-secondary technical education side, a promising vehicle for this collaboration could be the Academic Council, COSDAC, considering it is already playing a coordinating role focused on ensuring alignment between academic content and the skill standards demanded by the productive sector.²⁸ COSDAC has been doing a good job in its coordination role to date, but its scope is limited to upper-secondary and needs to be strengthened to reinforce the links with lead enterprises in each sector and to enhance its ability to respond quickly to changing industry needs. At the tertiary level, a model exists that could be built upon—the Advisory Councils, through which industries coordinate with technological universities to monitor academic programs for market relevance.

²⁸ In planning courses, COSDAC takes into account all the standards that come into play when designing a course. This includes any standards that might be registered by CONOCER and others that are currently used in the market for the particular career course that is being analyzed.

An important lesson for Mexico to adopt from other countries is recognizing the importance of developing the evidence for policy making. Three specific strategies worth consideration for Mexico are those employed by Ireland, South Korea, and, more recently, some countries in the European Union (EU). All developed vehicles for the active engagement of the education and productive sectors together with policy makers, to orient workforce development to real employment opportunities and in particular to prepare their workforce for sectors with the greatest potential for growth.

Ireland's Expert Group on Future Skills Needs (EGFSN) has the mission to ensure that labor market needs for skilled workers are anticipated and met. The EGFSN is led by a Board of Directors composed of leading employers, employee representatives, educational institutes, and government officials, with the private sector having a majority of seats. The EGFSN develops forecasting models to estimate future job growth and specific skill demand, rather than relying on an assessment of past trends. The models identify various possible growth scenarios, but encourage the government to institute strategies to meet the skill needs of the high-growth scenarios. The recommendations of the EGFSN are taken into account by the education institutions, which orient education programs to produce students to meet the identified skills (EGFSN, 2013). Unlike volunteer-based tripartite committees that have existed in Latin America to support policy, the EGFSN is well funded by the federal government with sufficient staff and resources to conduct the research defined by its Board (Kappaz, 2011).

A similar organization was created in Korea in 1997, the Korean Research Institute for Vocational Education and Training (KRIVET), with the mandate of supporting national human resources development policy and the lifelong skills development for the Korean population (KRIVET, 2013,



Box 12. Forecasting Skills Demand: The European Skills Survey

The survey allows policy makers to engage in analysis about: (i) the extent of skill development of adult employees over their working life, including their initial and continuing vocational training efforts; (ii) the changing nature of demand for formal educational qualifications, in terms of hiring requirements and for optimal job performance; (iii) the demand for skills in different jobs and industries; (iv) the extent to which the skills of individuals are matched to their job requirements and the extent to which jobs are designed to make the best possible use of all the skills of employees; (v) the changing nature of skills requirements and of skills mismatch over the job tenure of employees; and (vi) the demographic, socioeconomic, and contextual factors that may explain the skills mismatch status of individuals (Pouliakas, 2014). Although findings of the survey will be available in 2015, the initiative has aroused interest among governments to refine skills forecasting mechanisms to better orient education planning.

and Mourshed, 2012). As in the case of Ireland, KRIVET is part of an overall strategy to integrate labor market development with economic development. The organization reports directly to the Prime Minister's office and is affiliated with the National Research Council for Economics, Humanities and Social Sciences. It is well funded to carry out labor market research that is updated regularly to ensure that the vocational education system is aware of labor market trends. It also publishes evaluations of the impact of various VET programs and disseminates best practices.

In the EU, several countries opted for strategically channeled public interventions to correct information asymmetries and assure better orientation regarding the matching of skills acquired through education and training with those that are necessary to succeed in the labor market (Pouliakas, 2014). Most EU countries have institutional and methodological setups in place to anticipate skills and occupational and jobs needs, and to monitor skills mismatches and graduates' employability. More specifically, the European employers' survey on skill needs, developed in 2009, provided a valid instrument close to the employer's perspective, through a task-based approach. Respondents were asked about importance, change in importance, and preparedness for tasks increasing in importance.²⁹ Several items on newly emerging tasks were also asked for all selected occupations to address emerging skills needs and possibly related training needs. Most important, this survey was the basis for a broader survey that aims to improve understanding of how individuals' skills are developed over their career to match (or not) the changing skills demands and complexities of their jobs (See Box 12).

For Mexico, the starting point could be to work with existing business chambers to obtain the right information on sector needs. The chambers would need to convene the CEOs of the most important employers in each sector to provide orientation of technology and the talent needs for the future competitiveness of the industry. Building upon the experiences of Ireland and Korea, the government could support that dialogue with resources to conduct forward-looking analyses of economic trends (including skills and competencies demand and supply and potential labor market imbalances) so that the country is prepared not only for the immediate needs of employers but for anticipated needs to maintain the country's competitiveness in the future.

Expand programs that link curriculum to the productive sector, such as the CONALEP Trayectos Técnicos and the collaboration between local industry and technological and polytechnic universities.

Strategies in which local industry and education providers co-found academic programs, as has happened with the Trayectos Técnicos at CONALEP and with the locally based technological and

²⁹ Generic skills (17) are derived from the following domains: (i) cognitive skills, including reading, writing, mathematics, problem solving, foreign language; (ii) social/communication skills, including making presentations, persuading, instructing, working in teams; (iii) physical skills like manual dexterity; (iv) self-direction and learning-to-learn skills, including planning, task discretion, learning, adapting; (vi) green skills like resource saving and anti-pollution tasks; and (vii) ICT skills involving level of complexity.

polytechnic universities, are excellent examples that should be replicated to increase the relevance of education and training to the needs of the productive sector.

Another strategy for Mexico to link curriculum to market needs is to capitalize on the existing organization of subsystems in upper-secondary, which have a connection to specific sectors (industry, agriculture, marine sciences, and technology), so that subsystems focus on the most strategic sectors and align their efforts with sectors that already have their attention and seem to have the potential to flourish. This would bring dynamism to these rigid subsystems that have encountered difficulties in modernizing and adapting to the productive sector requirements.

(iii) Connect youth to the workplace

In terms of increasing the connection of youth to the workplace, more in-depth opportunities are needed in Mexico, where today there are very limited forms of integrating work and learning. Bridges should be built between VET and the world of work. There are very few opportunities for internships, and they are available only for students at the third year of upper-secondary technical education.

Analyses of successful VET programs have identified several positive characteristics of the ways in which programs connect students with the workplace (Hoffman, 2013). Some VET programs follow a dual modality, in which students spend part of their time in school and part of their time working. Such programs usually take three to four years to complete. Others use a school-based model, in which VET programs link to work by using school as a launch pad but still including work-based learning and/or school-based enterprises within the school. In school-based systems, the workplace learning could be done throughout the school year, taking up to 60% of the school week, or could be done in intensive periods for six months, or for one to two years following the first two years of classroom VET instruction. Important attributes in successful programs under both models include that students choose their path at age 15, that the school and work learning result in nationally recognized qualifications (in countries like Denmark and Germany, at the end of their training, students take an exam that is co-developed by the particular industry association in which the student was trained), and that if students opt for higher education, they can access special one- or two-year programs to qualify for university.

Expand opportunities for youth to connect with the workplace while they are still in school.

One model that combines school and work is the Cristo Rey high school model now being implemented in more than 25 schools across the United States which incorporates a Corporate Work Study Program (Cristo Rey website, 2013). In this model, companies contract with a school to fill full-time, entry-level jobs. The companies take on the risk of younger employees because they are working in collaboration with the school. The students obtain real job experience and earn income for their work but are employees of the school, which handles all payroll and other employer issues. In this model, students receive a standard high school diploma, but upon graduation are already connected with the workforce.

Mexico could also consider options for youth to receive a higher level of credentials at an earlier age and to acquire work experience between the ages of 16 and 19. An example of where early credentialing has been piloted successfully is the Pathways in Technology Early College High School (P-TECH) in the United States, which was developed in partnership with IBM Corporation (Aspen Institute, 2013). P-TECH was the first U.S. school to offer grades 9-14 (rather than the typical 12 years), using what is now referred to as the STEM Pathways to College and Careers model, which is based on a partnership among a school district, a community college, and a business. The business defines the requirements for entry-level jobs and assigns a mentor to each student. A coalition of industry advisors monitors the curriculum to guarantee its relevance over time. The P-TECH program differs from other pre-college programs or dual-enrollment programs where students attend high school and college simultaneously, in that the high school and college experience are fully integrated and students can earn an associate degree rather than earn college credits only.

The Mexican government is piloting a new youth apprenticeship program modeled after Germany's dual system, which may contribute to the effort to connect youth to the workforce. The challenge is to make sure that the program is embedded in an institutional structure, including a legal framework for apprenticeships that enables social partnerships and effective policy development. Mexico should take care to innovate in its model rather than strictly imitate the German dual system, because there is only a limited number of appropriate workplaces, and the number of apprentices learning at these places is small when compared to the number who could benefit from this learning scheme. More important, a collective sense of responsibility by employers, educators, and learners about the benefits of workplace learning should be the main driver of this policy.



Box 13. The School That Will Get You a Job

The Sarah E. Goode STEM Academy is located in a new high school on Chicago's South Side that is redefining what it means to be educated in the 21st century. "Kids at the school, which launched a year and a half ago, aren't called students but 'innovators.' They receive a hardcore focus on STEM skills and take six years to graduate instead of the traditional four. The extra two years means they walk away with an associate's degree on top of their high school diploma. They also take with them a job. Every student graduates with a promise of a US\$40,000-plus opportunity at IBM, the school's corporate partner and a key developer of the curriculum. A place at this school, which rises glittering in a neighborhood littered with dingy bail-bond shops, check-cashing places and fast food joints, is very likely a ticket to the middle class" (Time Magazine, 2014).

(iv) Engage employers actively in planning and program implementation

Public-private partnerships in education planning is an area of opportunity that has been explored in Mexico over the last 20 years but that has not reached its full potential and needs to be deepened, based on international best practices and Mexico's own experience to date. How to create the proper employer engagement continues to be the biggest challenge. Mexico has sector committees at all levels and representatives of the productive sector at the national level, but at the sector level a lot more needs to be done.

International research has found that the most effective collaboration models are not solely market-driven nor solely supply-driven, but rather are state-driven models in which employers, workers, and educators work together, particularly when organized around specific sectors. A recent study on the global problem of the education-to-employment transition determined that the most effective and transformative partnerships were those involving multiple providers and employers where sector-based collaboration was “critical not only to create widespread industry recognition for the curriculum but also to enable delivery of training in a more cost-effective manner” (Mourshed, 2012, p. 88).

Intermediary functions enable employers to participate in the process of education and training. For example, in Switzerland, the Swiss Federal Institute for VET engaged more than 100,000 stakeholders in a review of training qualifications, and regularly analyzes work situations, breaking them into component activities and developing competencies and curricula. In the Netherlands, the Dutch Centers of Expertise are involved in collecting labor market data.

Along these same lines, OECD analyses have found that the participation of all stakeholders, including employee unions together with employers, can lead to skills programs that meet both short-term firm-specific skill needs and broader, transferable skills that workers will need beyond their current employment (OECD, 2012f).

Mexico has a positive experience with public-private collaboration in the Riviera Maya. Expanding this experience to other regions and even sectors is important, in order to consolidate good practices and create the know-how base that is needed for this framework to prosper at a larger scale.

(v) Support professional development of teachers and collaborative exchange between schools

Teachers are always key to the quality of education, and should be supported in their profession. In Mexico, more efforts are needed to ensure that teachers play an integral role in the entire education process, especially as the country is still undergoing changes in the preferred teaching methodology.

Recent reforms point in the right direction. The teacher reform agenda considers providing better training and certification, including the development of clear professional pathways with related standards and ladders for teacher development. As the design of the proposed scheme to professionalize teachers' progresses, some considerations from the literature are worth considering.

A professional ladder for teachers would put them in a position to sustain improvement, as they would draw motivation from seeing the impact on their own work, as well as from their ownership in shaping educational practice (Mourshed et al., 2010).

The rotation of teachers between industry work and teaching—which has been tested but not systematized—should be fully developed and instituted. Developing a framework within the overall education system for creating better linkages with the business community could involve teachers rotating for two–three months into the private sector and working with human resources managers to learn more about the occupation they are teaching. The collaborative private-public partnership in the Riviera Maya provides examples of ways to make this happen.

Support for teachers should be expanded, including training, certification, rotation opportunities between industry work and teaching, and the development of clear professional pathways.

School clusters where teachers can exchange experiences and best practices are a good way to socialize these efforts. The country could even consider expanding opportunities for collaboration between educational institutions in order to facilitate greater school-to-school coordination and interaction, while standardizing best practices. In countries where this has proved effective, as in Finland through EduCluster, the expertise platform consists of higher education institutions, vocational education and training providers, consultants, and services business representatives. The network experts work in collaboration with each other to constantly renew and exchange know-how and innovative concepts and tools to teaching and learning (Cuddy, 2013a).

SKILLS STANDARDS: Forward Thinking the Existing Skills Standards System

Under the same logic that Mexico followed for the establishment of its skills standards certification system, many countries have established National Qualifications Frameworks (NQFs) as a means of supporting lifelong learning (OECD, 2003, 2004). These frameworks take many forms and appearances, according to national and sectoral specificities. Common to all is a wish to clarify (for students, parents, learning providers, employers, and policy makers) the main routes for achieving a particular qualification and to set the criteria according to which decisions on recognition of learning are made. Qualifications frameworks are also used for quality assurance and development purposes, providing a reference for improvement at local, regional, sectoral, and national levels (Commission of the European Communities, 2005). Most important, they enable coherence across education, training, learning, and certification systems.

In most successful countries, NQFs include occupational requirements that are recognized by both states and industries. Governments play a regulatory role and generally set up the student assessment and quality assurance systems, working closely at the national level with organizations representing occupational or

Focus skills standards on the sectors of greatest strategic importance for the economy.

industry sectors or employers and unions. The content of qualifications and the assessment of student and worker outcomes always include representatives of businesses and unions working in partnership with educators (Hoffman, 2011).

Mexico initiated efforts to develop similar frameworks first in the 90s with the creation of the skills standards and certification system (limited to technical/job skills), and more recently on the education side there is an attempt to create a qualifications framework that will involve all types of competencies. Despite these initiatives, analyses of these systems indicate they are still far from reflecting the needs of the productive sector. Updating standards and curriculum to answer to the needs of the productive sector is a dynamic process that requires constant attention and, on the certification side, CONOCER has not yet achieved this role as has been hoped. CONOCER standards have not always been validated or used by the private sector. Until these standards are embedded in the productive process and really become a trusted currency within key and strategic industries, the system will be incomplete. On the education side, the validity of a NQF will depend on whether it captures the competencies required in both formal education and the skills standards valued by the employer community.

Strengthening the skills standards system is essential for the positive work Mexico is achieving through its upper-secondary reform, especially because of the development of the National Curriculum Framework. The education strategy must be complemented with a job skills system that generates skills standards that are aligned with the requirements of the respective productive sectors, to ensure relevance not only of the vocational skills acquired by upper-secondary school students, but also of skills standards certifications.

Reconceptualizing CONOCER to play a new role as a clearinghouse that, aside from identifying standards can push certain sectors to up-skilling and improve productivity, is vital. Doing this should take into account all possible articulations with other agencies, as well as institutional and operative procedures that can converge as part of a critical path to build gradually a stronger system. Emphasis on strategic sectors is important for Mexico to maintain its comparative advantage and gain ground in the competitive global landscape. Countries such as Ireland and India were very deliberate in the skill sets they sought for their workforce. CONOCER needs to provide better analytical, technical, and organizational know-how to the sector committees it supports to guarantee the relevance and quality of the standards it identifies and develops with the support of public resources.

The system should also provide the necessary information to protect the general public from seeking certifications that will not render returns. This involves providing information on what certificates facilitate linkages between the educational supply and the labor market demand. For the CONOCER system to be relevant, it should capture existing world class/international standards.

The credibility of CONOCER among the productive sector needs to be rebuilt. This will require, among other things, strengthening CONOCER'S governance structure and leadership capacity, building its ability to control quality, increasing its responsiveness to industry needs, and identifying and working with priority sectors. This change will involve a move from a supply-based to

a demand-based approach to skills development. The private sector must play a leading role in defining and updating skills requirements to ensure that it has currency among employers. Partnerships need to be encouraged with productive sector bodies that are widely recognized as highly competitive, cutting edge innovators and/or key employers.

Financial incentives and co-financing mechanisms are necessary for this to happen. One of the weaknesses of the partnership CONOCER tried to establish with the productive sector is that the former never gave much funding to industries to allow them to take on the work that would benefit the labor force as a whole. In other skills standards systems, such as in Australia, the process is driven by private sector organizations that receive funding—as well as oversight—from the public sector. This model goes even farther by managing the concept of an “executive on loan,” where a representative from the industry offers business experience and executive mentorship to government agencies. The executive payroll is absorbed by the institution that has “lent” the professional to the government. This model has allowed business logic to permeate education and training planning, design, and implementation.

CAREER DEVELOPMENT WITH A LENS TO THE FUTURE: Expand Use of Labor Market Information and Career Guidance

All actors in the system in Mexico still need more information to inform better decisions. Employers need better information on school curricula and results in order to identify opportunities to collaborate with educational planners. Schools need more information on industry trends to adjust curriculum content and teaching methods to productive needs. And students and their families³⁰—as well as the overall workforce—need to be better informed (for example, on occupational rates and wage information) so that they can make better choices of career pathways. One possibility for achieving this is to build on the cutting-edge work done by the Labor Observatory. In order to optimize the value of the information generated by the Observatory, Mexico needs to enhance the dissemination and use of that information.

The Observatory’s relevance will also be enhanced if it can become a forecasting mechanism and provide information broken down at more regional and sector levels. In addition, the Observatory could have information on the specific certifications that industries are requiring of workers (and not only those registered in CONOCER, as it does currently and where the value is unclear). The Observatory could also be enhanced with the provision of information that shows which schools, certificates, and degrees are favored by employers, based on their recruitment practices and salary scales. Ideally, the system would have information on specific criteria to help students select the best school for them once they

**Strengthen the Labor
Observatory, to increase its
use by employers, jobseekers,
and educators.**

³⁰ Many international cases focus not only on students but also on parents. Guidance and consulting are done at different levels. For instance, parents may also visit firms and production plants/factories to see occupational profiles and career paths.

have selected a desirable career path. Information could be provided, for example, on employment trends of alumni to identify which schools are graduating youth with skills in greatest demand from strategic sectors.

Schools are not currently taking advantage of the Observatory as much as they could. More can be done to promote the Observatory and make it a more widely used reference tool. This could be incorporated in strengthened career guidance, which the OECD has recommended to facilitate the transition from education to employment (OECD, 2011). These services should be impartial and based on good labor market information. Effective guidance programs also include development of career-related skills, self-awareness, and self-esteem, which contribute to good job choices. All educational subsystems—upper-secondary as well as community colleges and universities—should provide better information and talent assessments to orient individuals in their decision making on career paths. This guidance should be provided by professional trained guidance counselors.

Provide better information and advice on skills, learning opportunities and career paths.

The analysis of labor market outcomes of the various graduates from education and training is also a crucial element in informing both students making career choices and policy makers charged with ensuring the effective use of government investment in education and training.

INCENTIVES: Put in Place the Right Mix of Incentives to Encourage Training and Continuous Learning

A sound system of human capital development needs to encourage access to lifelong learning opportunities, including training for those workers that have already joined the workforce. However, Mexican workers and the vast majority of small and medium sized firms today apparently do not fully appreciate the link among skills, productivity, and competitiveness and the value of continuous learning as a means of up-skilling and remaining current. This may be due to lack of awareness, lack of information, risk aversion, or uncertainties about the future state of the labor market. At the same time, the public sector training provision remains supply-oriented despite efforts to shift to a demand-driven system. Yet, workforce development occurs most naturally within the enterprise. Although government influence might be limited within this environment, there is room for the public sector to be a partner in cofinancing work based training initiatives.

Expand Bécate so its reach can have an impact on the Mexican labor market.

The timing is right in Mexico to reinstitute programs that will stimulate investment in the development of active workers, who are a key driver of productivity. This will require the commitment of sufficient capital on the part of the government. In recent years, investment in this arena has been well below its historic high of US\$187 million, which was invested in 1996. In 2011, Mexico

invested US\$120 million for programs related to labor intermediation, training, and labor protection (STPS, 2012). This investment represented just 0.01% of GDP, well below the OECD average of 0.66% on active labor market programs.

With this level of resources, Mexico was able to support almost 4 million jobseekers with intermediation services in 2012, but provided only 456,000 training subsidies through Bécate. This implies that less than 20% of youth ages 14–29 who are actively seeking employment (slightly more than 2.3 million) received the on-the-job training provided under Bécate. Although not all students require hands on training, evidence suggests that the majority of employers prefer their hires to have work experience. In order for the Bécate program, which has proven successful in evaluations, to have an impact on the Mexican labor market, the program coverage needs to be greatly expanded.

Reactivate a training program that considers a strong role from the private sector and the inclusion of technical assistance.

For active workers, a program that considers CIMO's key success features needs to be revived, as part of the overall active labor market framework because it is a key strategy of the country's employment and workforce development agenda that has great potential. The challenge for this to happen is how to capitalize on what worked and be sure to redirect the program to the private sector dynamic that had originally generated such a demonstration effect in the rest of the region. A revitalized program should rely on entrepreneurial organizations to co-operate and co-finance active worker training. Reinstating a national program with a strong strategic focus that actively seeks to improve overall firm performance as a basis for the technical assistance and training design and delivery is key. The role of the promoter as a broker that helps small firms analyze and prioritize their development needs is the main pillar of success of such a program.

Singapore provides a good example of a deliberate process of cooperation between government and firms in the provision of training and skills development. This cooperation among firms is largely a result of government initiatives, particularly through the Economic Development Board (EDB), an agency that has the primary function of attracting foreign direct investment and meeting foreign investors' demands for the required skilled personnel. The EDB's model of technology transfer and skills development brought together firms initially through collaborative training centers organized by the Singaporean government and the governments of foreign firms that decided to invest in Singapore, to industry-wide training centers operated by the government where the private sector provided critical skills training to meet their own needs. The companies providing the training were guaranteed that the workers would not take their skills elsewhere in the near term. The incentives provided to firms to invest in training, and the government's own willingness to fund or build the administrative apparatus for the delivery of skills to the entire industry, are of critical importance in the way in which government has fostered this cooperation (Kuruvilla et al., 2001).

RESULTS-ORIENTED APPROACH: Develop and Use Outcome Indicators to Assess Progress

Establish a system for tracking progress in improving competencies of the workforce.

To facilitate work toward achieving a vision for the future, a system has to be in place to measure and monitor the evolution from where the country is today. Many countries measure desired economic and development levels, and track progress of the workforce using the qualifications frameworks or competency maps that state what students should know to perform specific tasks, by industry. These qualifications are linked to international standards.

Mexico has taken a step in this direction with RIEMS, as it requires a set of competencies (a profile) that graduates should have once they finalize their upper-secondary studies. PISA and ENLACE also offer valuable information on learning outcomes. But the country has not yet developed an instrument that provides insights into the availability of some key skills and how they might be used at work.

All the cited countries participate with the OECD's PIAAC (Program for the International Assessment of Adult Competencies), which collects and analyzes data that assist governments in assessing, monitoring, and analyzing the level and distribution of skills among their adult populations as well as the utilization of skills in different contexts. The Survey of Adult Skills and the Education and Skills Online Assessment are part of a package of tools available to support countries in developing, implementing, and evaluating policies that foster both the development of skills and the optimal use of existing skills. Each industry association uses its metrics for assessing skills and competencies, and these competencies are tested in the final exam. The final exam consists of written tests and demonstration of work/performance. Students completing the dual test get a certificate that is recognized by employers in the industry. Some certificates, such as mechatronics, are internationally recognized.

The interesting aspect of these kinds of instruments is that they offer insights not only into skills proficiency, but also into the application of knowledge and know-how at work. They also have the virtue of offering a picture of the skills of the overall population, as the sample frames are required to cover at least 95% of the target population (population ages 16–65 years) and the territorial unit covers the country as a whole. Robust, internationally comparable measures of the proficiency of adults in cognitive skills such as literacy, numeracy, and problem solving arguably have the potential to provide better proxy measures of human capital than commonly used measures such as educational attainment or years of schooling, and they provide important information themselves (OECD, 2013b, 2013c; Woessman, 2003; Hanushek and Woessmann, 2009, 2011).

Mexico could analyze the possibility of participating in this existing OECD survey or developing an assessment instrument under a similar scheme (like those developed by the EU). The experience of large-scale international assessments and the approach to the definition of competencies and skills in this sort of study might provide an influential backdrop to the development of a NQF with the skills needed for individuals to participate successfully in society and for the Mexican economy, in a way that can facilitate measurement.





Chapter V

CLOSING REMARKS

It is our hope that this paper has provided insight into the opportunities and challenges ahead for Mexico to consolidate a lifelong learning policy framework, building on the progress and avant garde approach adopted by the country with regard to forging a competency-based education model that already contemplates job skills, academic competencies, and employability skills. While Mexico's adoption of this model is laudable, a key weakness thus far has been that the curriculum design for upper-secondary schools and adult training programs has not been linked to a broader economic development strategy. A central and urgent issue for Mexico is to define a coherent skills development policy agenda that clearly shows how to improve the productivity of its workforce and the competitiveness of the economy.

This is the right moment to advance a common understanding among policy makers that their investments in education and training will be more effective if they are in sync with economic policy. The current context—where serious efforts in structural reforms, coalition building, and partnership development are present—creates the opportunity for an ongoing dialogue among stakeholders and appears ideal for consensus building to begin and for an appropriate incentive structure to be put in place. The future of lifelong learning in Mexico and its contribution to growth and productivity need to be driven by strategic planning rather than inertia. This report has, we hope, provoked interest in moving forward. Mexico is well poised to finally overcome its productivity gap and bring its large workforce and powerful economy into the competitive position the country is capable of achieving.

ANNEX 1. COUNTRY COMPARISON

- MAIN ECONOMIC AND SKILLS DEVELOPMENT INDICATORS

Key factors	Indicator	United Kingdom	Ireland	Singapore	New Zealand	Australia	Germany	Korea	Mexico
Economy	Stage of development ³¹	3 - innovation-driven	3 - innovation-driven	3 - Innovation-driven	3 - Innovation-driven	3 - Innovation-driven	3 - innovation-driven	3 - innovation-driven	2 - 3 transition
	Foreign direct investment, net inflows in % of GDP ³²	2.3	19.4	20.6	1.3	3.7	0.8	0.4	1.3
	Average real GDP growth ³³ in percent (2004-2012)	1.05	1.66	4.3	1.7	3	1.45	3.7	2.77

³¹ World Economic Forum, Global Competitiveness Report 2013-2014. According to the World Economic Forum, an economy is at stage 1, factor-driven, when the country competes thanks to unskilled labor force and natural resources. Firms dedicate themselves to selling basic products or commodities. A country in this stage of development can maintain competitiveness thanks to well-functioning public and private institutions, a well-developed infrastructure, a stable macroeconomic environment, and a healthy workforce with basic education completed.

A country is at stage 2, efficiency-driven, when companies have to develop more efficient production process and improve on products' quality because of the price competition with other firms and increased wages. To be more competitive, the country has to improve on higher education and training, efficient goods markets, well-functioning labor markets, developed financial market, ability to harness the benefits of existing technologies, and a large domestic or foreign market.

A country is at stage 3, innovation-driven, when companies produce or innovate new goods. In order to sustain higher wages and the associated standard of living, businesses should be able to compete with new and unique products.

The criteria used to categorize countries in different development stages are the GDP per capita and the share of exports of mineral goods in total exports.

³² World Bank Databank, 2012.

³³ World Bank Databank, 2012.

**No World Bank enterprise data survey.

Key factors	Indicator	United Kingdom	Ireland	Singapore	New Zealand	Australia	Germany	Korea	Mexico
Economy	Top sector investments / priorities <small>34, 35, 36, 37, 38, 39, 40, 41</small>	Healthcare and life sciences, advanced and high-value products manufacturing, construction, digital and creative industries, retail, professional and business services, space industry, tourism.	Agri-business, information and communication technologies (ICT), international financial services, creative Industries, healthcare services, tourism and hospitality, retail, construction, professional and business services.	Construction, wholesale and retail, transportation and storage, information and communications finance & insurance, energy retail, agri-business, tourism, manufacturing services.	High technology manufacturing, ICT, petroleum and energy sector, construction, tourism.	Manufacturing sectors, space technologies, ICT, construction, defense.	Renewable energies, health sector, services industry, ICT, transport.	High value services, green technologies, construction industry.	ICT, health services, pharmaceutical industry, plastic industry, renewable energies.
	Employment-to-population ratio, age 15+, total (female, male) (2013, data of 2012 for Singapore) ⁴²	57.7 (52.4, 63.4)	52.4 (47.3, 57.6)	66 *	64.1 (58.6, 69.9)	61.3 (55.4, 67.3)	57.1 (51.9, 62.6)	59.5 (48.8, 70.8)	56.2 (40.9, 73.1)
	Small and medium enterprises, % GDP (2013) <small>43, 44, 45, 46, 47, 48, 49, 50</small>	48.1 (private sector turnover)	50.1	50 (SMEs defined as 5≤200 workers)	27.8	63 (SMEs defined as 0≤200 workers)	48	45.1	52

³⁴ Department for Business, Innovation and Skills, United Kingdom, The Plan for Growth, 2011.

³⁵ Department of Finance Ireland, A strategy for growth. Medium Term Economic Strategy 2014-2020, 2013.

³⁶ Ministry of Trade and Industry Singapore, retrieved at: <http://www.mti.gov.sg/MTIInsights>.

³⁷ Ministry of Business, Innovation and Employment, New Zealand, Business Growth Agenda; Future Direction, 2014.

³⁸ Department of Innovation, Industry, Science and Research, Australia, Strategic Plan 2011

³⁹ Bundesministerium für Wirtschaft und Energie, Industriepolitik, retrieved at: <http://www.bmw.de/DE/Themen/Industrie/industriepolitik.html>

⁴⁰ Ministry of Trade, Industry and Energy, Industry Policies, retrieved at: http://www.motie.go.kr/language/eng/policy/Ipolicies_05.jsp

⁴¹ Instituto Tecnológico de Estudios Superiores de Monterrey, Identificación de Sectores Estratégicos, 2013.

*No information available about male and female participation rate for Singapore

⁴² World Economic Forum., op cit.

⁴³ Department for Business Innovation and Skills, op cit.

Key factors	Indicator	United Kingdom	Ireland	Singapore	New Zealand	Australia	Germany	Korea	Mexico
	Small and medium enterprises, % total employment (2013) 51, 52, 53, 54, 55, 56, 57, 58	59.3	52	67	30.2	33	60.2	87.7	72
Skills Gaps	Firms identifying an inadequately educated workforce as a major constraint, in percent of total of firms (2010, data of 2005 for Ireland) ⁵⁹	**	15.6	**	**	**	7	6.8	30.9

⁴⁴ Central Statistics Office Ireland, op cit.

⁴⁵ Department of Statistics Singapore, op cit.

⁴⁶ Ministry of Business, Innovation and Employment, op cit.

⁴⁷ Australasian SME alliance, op cit.

⁴⁸ Destatis, Statistisches Bundesamt, op cit.

⁴⁹ INEGI, op cit.

⁵⁰ Small and Medium Business Administration, op cit.

⁵¹ Department for Business, Innovation and Skills, Business Population Estimates for the UK and regions 2013, 2014.

⁵² Central Statistics Office Ireland, Business in Ireland 2011, 2013.

⁵³ Department of Statistics Singapore, Singapore Economy 2005-2014, 2014.

⁵⁴ Ministry of Business, Innovation and Employment, Small and Medium Sized Enterprises, retrieved at: <http://www.med.govt.nz/business/business-growth-internationalisation/small-and-medium-sized-enterprises>.

⁵⁵ Australasian Small and Medium Enterprises alliance, SME Facts, retrieved at: <http://www.asmea.org.au/SMEFacts>.

⁵⁶ Destatis, Statistisches Bundesamt, Small and Medium-sized enterprises, 2013.

⁵⁷ INEGI, Censo económico 2009, 2010.

⁵⁸ Small and Medium Business Administration, Criteria of Korean SMEs, retrieved at: <http://www.smba.go.kr/eng/smes>.

⁵⁹ World Bank, Enterprise Survey, 2010, World Bank.

Key factors	Indicator	United Kingdom	Ireland	Singapore	New Zealand	Australia	Germany	Korea	Mexico
	Talent mismatch ⁶⁰	9	10	5.9	3.7	4.0	4.1	***	5.7
	Top three occupations employers are having difficulty filling (2013) ⁶¹	Skilled trades Engineers Drivers	Skilled trades Engineers Managements / Executive	Administrative assistants and Office staff Supervisors Laborers	Engineers Sales representatives IT staff	Skilled trades Engineers Sales representatives	Skilled trades Engineers Accounting and finance staff		Technicians Sales representatives Production operators
Education and Training Investment	Current expenditure as a % of total of GNI (2010, data of 2009 for Korea) ⁶²	5.8	7.1	3.0	7.2	5.1	4.8	4.2	5.1
	Firms offering formal training in percent of total of firms ⁶³ (2005, data of 2006 for Mexico)	**	73.2	**	**	**	35.4	39.5	24.6
Educational Achievement	Average years of total schooling, age 25+ (2010) ⁶⁴	9.1	11.6	8.8	12.5	12	12.2	11.7	8.5
	Upper-secondary graduation rate ⁶⁵	91	91	98	90		83	89	45

⁶⁰ Hays, Skills mismatch index, 2013. The talent mismatch component measures the mismatch between the skills needed by businesses and skills possessed by the labor force. A high score means that the numbers of long-term unemployed and vacancies are both increasing, suggesting that available labor does not have the skills employers want. A low score implies that employers are having an easier time finding the talent they need. From 1 to 10.

⁶¹ Manpower, Talent Shortage Survey, 2013.

⁶² UNESCO, Institute for Statistics, 2011.

⁶³ Data World Bank, <http://data.worldbank.org/indicator/IC.FRM.TRNG.ZS?page=1>.

⁶⁴ Worldbank, databank, 2010.

⁶⁵ OECD, Education at a Glance 2013, OECD.

**No World Bank enterprise data survey.

***No Hays Report about Korea.

Key factors	Indicator	United Kingdom	Ireland	Singapore	New Zealand	Australia	Germany	Korea	Mexico
	Population completed tertiary education in percent of total enrolled students (2010) ⁶⁶	13.6	20.2	12.2	24.4	22.4	12.8	17.9	13.9
	PISA; Mean performance on mathematics/reading/science scale (15-year-old) ⁶⁷	494/ 499/ 514	501/ 523/ 522	573/ 542/ 551	500/ 512/ 516	504/ 512/ 521	514/ 508/ 524	554/ 536/ 538	413/ 424/ 415
	Extent of staff training, scale 1 to 7 / rank out of 148 (2013) ⁶⁸	4.7 22	4.8 20	5.2 6	5.0 15	4.5 30	5.1 10	4.2 51	4.0 72
	Human Development Index Education Ranking ⁶⁹	26	7	18	6	2	5	12	61
	Global Competitiveness Higher Education and Training ⁷⁰ (ranking of 148 countries; score from 1 to 7)	17 Score: 5.5	18 Score: 5.4	2 Score: 5.9	9 Score: 5.7	15 Score: 5.5	3 Score: 5.9	19 Score: 5.4	85 Score: 4.0

⁶⁶ OECD Stats, Education and Skills, 2010.

⁶⁷ OECD. Programme for International Student Assessment. Retrieved on May 2014 from <http://www.oecd.org/pisa/keyfindings/PISA-2012-results-snapshot-Volume-I-ENG.pdf>.

⁶⁸ World Economic Forum, op cit.

⁶⁹ United Nations Development Program (UNDP), Human Development Index, 2012, UNDP.

⁷⁰ World Economic Forum, op cit.

REFERENCES

- Almeida, R., Behrman, J. and Robalino, D., editors. 2012. *The Right Skills for the Job? Rethinking Training Policies for Workers*. Washington, DC: World Bank.
- Álvarez-Mendiola, G. 2006. "Lifelong learning policies in Mexico: context, challenges and comparisons." *Compare*, 36, (3), September 2006, 379-399.
- Aring, M. and Brand, B. 1998. *The Teaching Firm. Where Productive Work and Learning Converge*. Newton: EDC.
- Aring, M. and Corbitt, C. 1998. *Singapore Case Study. Best Practices Compass for Workforce Development*. EDC. 1998. Available online at:
www.eric.ed.gov/ERICWebPortal/recordDetail?accno=ED461767.
- Aring, M. 2013. *Increasing Costa Rica's Technical Skills and Knowledge - the raw materials of a knowledge economy*. Washington DC: Inter-American Development Bank.
- Arteaga García, A., Sierra Romero, S. and Flores Lima, R. 2009. "The Vocational Training System in Mexico: Characteristics and Actors, Strengths and Weaknesses." In Bosch, G. and Charest, J. editors. *Vocational Training: Institutional Perspectives*. New York: Routledge.
- Aspe, P. 2013. *Factors Driving Opportunities for Private Equity Funds in Mexico*. Presentation to ILPA-Cimarron Investor Delegation to Latin America on February 25, 2013. Not published.
- Aspen Institute. 2013. *Description of successful education model*. Retrieved from
<http://www.aspeninstitute.org/policy-work/economic-opportunities/skills-americas-future/models-success/ibm>.
- Australian National Skills Standards Council: <http://www.nssc.natese.gov.au/home>.
- Australian Workforce and Productivity Agency website: <http://www.awpa.gov.au>.
- Barro, R. and Jong-Wha, L. 2013. "A New Data Set of Educational Attainment in the World, 1950-2010." *Forthcoming. Journal of Development Economics*. Retrieved from
<http://www.barrolee.com>.
- Behringer, F. and Coles, M. 2003. "The Role of National Qualifications Systems in Promoting Lifelong Learning." *OECD Education Working Papers*, (3). OECD Publishing.

- Bolio, E., Remes, J., Lajous, T., Manyika, J., Rossé, M., Ramirez, E. 2014. *A tale of two Mexicos: Growth and prosperity in a two-speed economy*. Published on McKinsey online on March 2014 at: http://www.mckinsey.com/insights/americas/a_tale_of_two_mexicos.
- Brunner, J. J., Santiago, P., García Guadilla, C., Gerlach, J. and Velho, L. 2008. *OECD Reviews of Tertiary Education: Mexico*. Paris: Organisation for Economic Co-operation and Development.
- Cabrol, M. and Székely, M. editors. 2012. *Educación para la Transformación*. Washington, DC: Inter-American Development Bank.
- Campos, R., Esquivel, G. and Lustig, N. 2012. *The Rise and Fall of Income Inequality in Mexico, 1989-2010*. Working Papers 1201. Tulane University, Department of Economics.
- Carvalho, R. A. 2012. *Análisis preliminar de los cambios producidos al interior de las empresas, en al menos dos sectores estratégicos que hayan trabajado con el CONOCER, en el marco de PROFORHCOM, FASE II*. Inter-American Development Bank.
- CEDEFOP, Centro Europeo para el Desarrollo de la Formación Profesional. 2012. *Sectoral Perspectives on the Benefits of Vocational Education and Training*. Research Paper No. 22. Luxembourg: Office of the European Union.
- Centro de Investigación en Economía y Políticas Públicas, Universidad de las Américas. 2006 *Evaluation of the training for the unemployed components of the Labor Market Modernization Project (Phase I and II) in Mexico*. Report prepared for the Inter-American Development Bank Office of Evaluation and Supervision. May 2006.
- Cristo Rey Jesuit High School. Retrieved from <http://www.cristorey.net/cwsp/overview.html>.
- CONALEP, Colegio Nacional de Educación Profesional Técnica. 2012a. Presentation to the Inter-American Development Bank in September, 2012.
- . 2012b. *Certificación de competencias docente conforme a la RIEMS*. Presentation delivered November 6, 2012.
- CONEVAL, Consejo Nacional de Evaluación de Política de Desarrollo Social. (2013). *Informe de la Evaluación Específica de Desempeño 2012-2013. Valoración de la información de desempeño presentada por el programa*.
- Cuddy, N. 2013a. An Eternal Quest for Equity and Quality in VET. Presentation at the Experts Meeting on Effectively Linking Secondary Education to Employment sponsored by the Inter-American Development Bank and the Ministry of Education (SEP), held in Mexico City April 29, 2013.

- Cuddy, N, Leney, T and Ward, C. 2010. *Case Studies on Lifelong Learning and Labor Competencies in OECD Countries*. Mimeo.
- Cuddy, N. 2013b. *Skills Development Systems: Some successful experiences from the EU countries*. Presentation at the Experts Meeting on Effectively Linking Secondary Education to Employment sponsored by the Inter-American Development Bank and the Ministry of Education (SEP), held in Mexico City April 30, 2013.
- de Anda, M. L. 2010. "Background case study on Mexico". Background paper for Allais, S. *The Implementation and impact of National Qualifications Frameworks: Report of a study in 16 countries*. Switzerland: International Labour Organization.
- de los Heros Rondenil, M. 2010. *Análisis de la Encuesta de Inserción de Egresados 2009 del Colegio Nacional de Educación Profesional Técnica*. Mexico: Facultad Latinoamericana de Ciencias Sociales.
- Dirección General de Centros de Formación para el Trabajo. (2013). *Alianzas estratégicas de la Dirección General de Centros de Formación para el Trabajo y el sector productivo*. Inputs presented for the preparation of Inter-American Development Bank new PROFORHCOM operation.
- Duryea, S. and Pagés, C. 2002. *Human Capital Policies: What they Can and Cannot Do for Productivity and Poverty Reduction in Latin America*. Washington, DC: Inter-American Development Bank.
- Eberts, R. 2013. *Building Effective Partnerships between Industry and Education: Perspectives from the United States*. Presentation in representation of the W.E. Upjohn Institute for Employment Research, presented at the Experts Meeting on Effectively Linking Secondary Education to Employment sponsored by the Inter-American Development Bank and the Ministry of Education (SEP), held in Mexico City April 29-30, 2013.
- Flores Crespo, P. 2005. *Educación superior y desarrollo humano. El caso de tres universidades tecnológicas, primera impresión*, México: Asociación Nacional de Universidades e Instituciones de Educación Superior.
- Flores Lima, R. 2012. *Best practices to identify, describe, deliver and certify competencies. Presentation the Inter-American Development Bank Workshop: Training in business enterprises and work force competencies*. Washington, DC: September 13-14, 2012.
- Foroohar, R. 2014. *The School That Will Get You a Job. A New Kind of Education That Shows Why Four Years of High School Isn't Enough*. Time Magazine, 183 (7).

- Hamilton, V. 2012. *Career Pathway and Cluster Skill Development: Promising Models from the United States*. OECD Local and Economic Development (LEED) Working Papers 2012/14. Retrieved from <http://dx.doi.org/10.1787/5k94g1s6f7td-en>.
- Hanushek, E. A. and Woessmann, L. 2007. *Education Quality and Economic Growth*. Washington, DC: World Bank.
- . 2008. "The Role of Cognitive Skills in Economic Development." *Journal of Economic Literature*, American Economic Association, 46 (3), September 2008.
- . 2009. *Schooling, Cognitive Skills, and the Latin American Growth Puzzle*. NBER Working Papers 15066, National Bureau of Economic Research, Inc.
- . 2011. "The Economics of International Differences in Educational Achievement." *Handbook of the Economics of Education*, Elsevier.
- Hoffman, N. 2011. *Schooling in the Workplace: How Six of the World's Best Vocational Education Systems Prepare People for Jobs and Life*. Cambridge, Massachusetts: Harvard Education Press.
- . 2013. *How Strong Vocational Education Systems Transition Young People into the World of Work*. Presentation at the Inter-American Development Bank Conference Buenas Prácticas Internacionales de Gestión y Capacitación de Recursos Humanos: El Modelo Riviera Maya, Mexico, September 2013.
- Kappaz, C. and Siegel, W. 2002. *The Role of the Multilateral Investment Fund in Skill Standards and Certification*. Washington, DC: Inter-American Development Bank.
- Kappaz, C. 2011. *Employment Services in Ireland: A Case Study*. Washington, DC: Inter-American Development Bank.
- Korean Research Institute for Vocational Education and Training (KRIVET)
website <http://eng.krivet.re.kr>.
- INEE, Instituto Nacional para la Evaluación de la Educación. 2011. Retrieved from <http://www.inee.edu.mx>.
- . 2012. *Panorama Educativo de México 2012. Indicadores del Sistema Educativo Nacional. Educación Básica y media Superior*. Mexico: INEE.
- INEGI, Instituto Nacional de Estadística y Geografía. 2009. *Módulo de Educación, Capacitación y Empleo. Encuesta Nacional de Ocupación y Empleo (MECE-ENOE)*.

- Inter-American Development Bank. 2006. *Evaluation of the training for the unemployed components of the Labor Market Modernization Project (Phase I and II) in Mexico*. Report prepared for the Inter-American Development Bank Office of Evaluation and Supervision by the Centro de Investigación en Economía y Políticas Publicas, Universidad de las Américas.
- . 2007. *Nota de Diálogo de la Unidad de Mercados Laborales y Seguridad Social (LMK) en México*. Mexico: Inter-American Development Bank.
- . 2010. *Ciencia, Tecnología e Innovación en América Latina y el Caribe. Un compendio estadístico de indicadores*, Washington, DC: Inter-American Development Bank..
- . 2012a. *Nota de Diálogo de la Unidad de Mercados Laborales y Seguridad Social (LMK) en México*. Mexico: Inter-American Development Bank.
- . 2012b. *Hacia un Diálogo en Nuevas Políticas de Mercado Laboral y Seguridad Social para Impulsar la Productividad*. PowerPoint Presentation, October 2012.
- . 2012c. *Crecimiento y Productividad en México*. PowerPoint Presentation, October 2012.
- International Finance Corporation. 2013. *IFC Jobs Study: Assessing Private Sector Contributions to Job Creation and Poverty Reduction*. Washington, DC: International Finance Corporation.
- International Labour Organization. 2011. "Formulating a National Policy on Skills Development". *Skills for Employment Policy Brief*. Retrieved from http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_167172.pdf
- . 2013a. *ILO Global Employment Trends 2013*. Data available online at: http://www.ilo.org/global/about-the-ilo/media-centre/issue-briefs/WCMS_206128/lang--en/index.htm
- . 2013b. *Towards a Model Apprenticeship Framework: A Comparative Analysis of National Apprenticeship Systems*. Geneva: International Labor Organization.
- International Monetary Fund. 2013. *IMF World Economic Outlook*. Retrieved from <http://www.imf.org/external/pubs/ft/weo/2013/update/01/index.htm>.
- Ireland's Department of Education and Skills website: <http://www.education.ie/en/>.
- Ireland's Department of Jobs, Enterprise and Innovation: <http://www.enterprise.gov.ie/en/>.
- Ireland's Expert Group on Future Skills Needs website: <http://www.skillsireland.ie/>.
- Ireland's National Standards Authority website: <http://www.nsai.ie/>.

- Irish Congress of Trade Unions. (2011). *A New Skills Policy for a New Economy*. Retrieved from http://www.ictu.ie/download/pdf/new_skills_for_a_new_economy.pdf.
- Jankowska, A., Nagengast, A. and Perea, J. R. 2012. *The Product Space and the Middle-Income Trap: Comparing Asian and Latin American Experiences*. OECD Development Centre Working Paper No. 311. Paris: Organisation for Economic Co-operation and Development.
- Kuruvilla, S., Erickson, C. L. and Hwang, A. 2001. *An assessment of the Singapore skills development system: Does it constitute a viable model for other developing nations?* Retrieved from Cornell University, ILR School site: <http://digitalcommons.ilr.cornell.edu/articles/214/>.
- Lane, J. and Tan, H. 1996. Evaluación del Programa DGETI. Processed. Lee, K. W. 1998. "An Alternative Technical Education System: A Case of Study of Mexico." *International Journal of Educational Development*. Oxford.
- López-Acevedo, G. 2002. *An Alternative Technical Education System in Mexico: A Reassessment of CONALEP*. World Bank.
- . 2004. *A Duration Analysis of CONALEP (Mexico's National Technical Professional School)*. World Bank Policy Research Working Paper No. 3327. Washington, DC: World Bank.
- Lynch, L. M. and Black, S. E. 1995. *Beyond the incidence of training: evidence from a national employers survey*. NBER Working Paper No. 5231. Washington, DC: National Bureau of Economic Research.
- Manpower Group. 2012. *2012 Talent Shortage Survey Results*. Retrieved from <http://www.manpowergroup.us/campaigns/talent-shortage-2012>.
- . 2013. *2013 Talent Shortage Survey Results*. Retrieved from http://www.manpowergroup.com/wps/wcm/connect/587d2b45-c47a-4647-a7c1-e7a74f68fb85/2013_Talent_Shortage_Survey_Results_US_high+res.pdf?MOD=AJPERES.
- Martí, R. 2013, August 6. *El drama de los rechazados*. (Web blog post). Retrieved from: <http://eleconomista.com.mx/antipolitica/2013/08/06/drama-rechazados>.
- Martin, J. P. 2000. *What Works among Active Labour Market Policies: Evidence from OECD Countries' Experiences*. Paris: OECD Economic Studies No. 30.
- Mason, G. 2008. *The impact of skills on relative productivity performance at national level: Exploring channels of influence*. London: National Institute of Economic and Social Research.
- Minowa, M. 2000. "Mexico." In Gill, Indermit, Fluitman, Fred and Dar, Amit. *Vocational Education*

and Training Reform. Matching Skills to Markets and Budgets. Washington, DC: World Bank.

Mourshed, M., Chinezi, C. and Barber, M. 2010. *How the world's most improved school systems keep getting better.* Published by McKinsey online in November 2010 at: <http://mckinseysociety.com/how-the-worlds-most-improved-school-systems-keep-getting-better>.

Mourshed, M., Farrell, D. and Barton, D. 2012. *Education to Employment: Designing a System that Works.* Published by McKinsey online in December 2012 at: <http://mckinseysociety.com/education-to-employment>.

Organisation for Economic Co-operation and Development. 1994. *The OECD Jobs Study, Evidence and explanations, Part II: The adjustment potential of labour market.* Paris: Organisation for Economic Co-operation and Development.

--- 2001. *The Well-being of Nations. The Role of Human and Social Capital.* Paris: Organisation for Economic Co-operation and Development.

---. 2010a. *PISA 2009 Results: What Students Know and Can Do. Volume I.* Paris: Organisation for Economic Co-operation and Development.

---. 2010b. *Strong Performers and Successful Reformers in Education: Lessons from PISA for Mexico.* Paris: Organisation for Economic Co-operation and Development.

---. 2011. *Learning for Jobs 2011.* Paris: Organisation for Economic Co-operation and Development.

---. 2012a. *Better Skills, Better Jobs, Better Lives.* Paris: Organisation for Economic Co-operation and Development.

---. 2012b. *Country Note on Mexico* for the OECD Education at a Glance 2012.

---. 2012c. *Economic Surveys: Spain 2012.* OECD Publishing.

---. 2012d. *Education at a Glance 2012.* Paris: Organisation for Economic Co-operation and Development.

---. 2012e. *Employment and Labor Market Statistics. Youth Unemployment data published July 2012.* Retrieved from http://www.oecd-ilibrary.org/employment/youth-unemployment-rate_20752342-table2.

---. 2012f. OECD analysis of PIAAC field trials in *Better Skills, Better Jobs, Better Lives.* Paris: Organisation for Economic Co-operation and Development.

---. 2012g. *Skills Development Pathways in Asia.* Paris: Organisation for Economic Co-operation

and Development.

- . 2013a. *PISA Results in Focus: What 15 year olds know and what they can do with what they know*. Paris: Organisation for Economic Co-operation and Development.
- . 2013b. *Skilled for Life? Key Findings from the Survey on Adult Skills*. Paris: Organisation for Economic Co-operation and Development.
- . 2013c. *The Survey of Adult Skills: Reader's Companion*. OECD Publishing.
- . 2014. *Economic Outlook 2014*. Paris: Organisation for Economic Co-operation and Development.
- Pagés, C. editor. 2010. *The Age of Productivity: Transforming Economies from the Bottom Up*. Washington, DC: Inter-American Development Bank.
- Parker, A. H. and Johnston, W. B. 1987. *Workforce 2000: Work and Workers for the Twenty First Century*. Washington, DC: Hudson Institute.
- Roundtable. (2005). *El Sistema de Formación Vocacional en México (August 26, 2005)*. Casa del Tiempo, Universidad Autónoma Metropolitana. Cited in Arteaga, A., Sierra, S. and Flores Lima, R. 2006, "The Vocational Training System in Mexico: Characteristics and Actors, Strengths and Weaknesses." In Charest, J. and Bosch, G. editors. *Vocational Training: International Perspectives*. New York: Routledge
- Ruane, F. and Görg, H. 1997. *Reflections on Irish Industrial policy towards Foreign Direct Investment*. Trinity Economic Papers Series. Policy Paper No. 97/3, Dublin: Ireland.
- SEMS, Subsecretaría de Educación Media Superior. 2008. *Reforma Integral de la Educación Media Superior en Mexico: Creación de un Sistema Nacional de Bachillerato en un marco de diversidad*. Mexico City: Subsecretaría de Educación Media Superior.
- SEP, Secretaría de Educación Pública. 2005. *OECD Thematic Review of Tertiary Education: Country Background Report for Mexico*. Prepared by the Mexican Undersecretariat for Higher Education.
- . 2012a. *Reporte de la Encuesta Nacional de Deserción en la Educación Media Superior*. Mexico City: Secretaría de Educación Pública.
- . 2012b. *Sistema Educativo de los Estados Mexicanos: Principales Cifras Ciclo Escolar 2011-2012*. Mexico City: Secretaría de Educación Pública.
- . 2013. *Resultados Prueba ENLACE Nacional, Último grado de bachillerato*. Mexico City:

SHCP, Secretaría de Hacienda y Crédito Público de México. 2013. Presentation February 2013, citing IMF Fiscal Monitor October 2012, INEGI, and Mexican Bureau of Economic Analysis. Not published.

Sims, C. 2013. *Employer engagement and leadership in skills: international perspectives, the Indian experience, and insights for Mexico*. Presentation in representation of City & Guilds, presented at the Experts Meeting on Effectively Linking Secondary Education to Employment sponsored by the Inter-American Development Bank and the Ministry of Education (SEP), held in Mexico City April 30, 2013.

Singapore's Ministry of Trade and Industry website: <http://www.mti.gov.sg>.

Singapore's SPRING website: <http://www.spring.gov.sg>.

STPS, Secretaría de Trabajo y Protección Social. Data retrieved from http://www.stps.gob.mx/bp/secciones/conoce/areas_atencion/areas_atencion/servicio_empleo/becate.html.

Symonds, W. C., Schwartz, R. and Ferguson, R. 2011. *Pathways to prosperity: Meeting the challenge of preparing young Americans for the 21st century*. Cambridge, MA: Pathways to Prosperity Project, Harvard University Graduate School of Education.

Székely, M. 2013. *Recursos Humanos para la Productividad, la Equidad y el Desarrollo: Algunos Retos para Colombia*. Presentation made in Bogota on March 12, 2013.

---. 2014a. *Evaluación Final del Componente 1 del Programa Multifase de Formación de Recursos Humanos Basada en Competencias (PROFORHCOM)*, Fase II. Mexico: Inter-American Development Bank.

---. 2014b. *Evaluación Final del Componente 2 del Programa Multifase de Formación de Recursos Humanos Basada en Competencias (PROFORHCOM)*, Fase II. Mexico: Inter-American Development Bank.

Tamkin, P., Giles, L., Campbell, M. and Hillage, J. 2004. *Skills Pay: The Contribution of Skills to Business Success*. Wath-upon-Deane: SSDA.

Tan, H., Lopez-Acevedo, G., Flores Lima, R., Rubio Sánchez, M., Slota, E., Tinajero, M. and Beker Busjeet, G. 2007. *Evaluating Mexico's Small and Medium Enterprise Programs*. Washington, DC: World Bank.

Topel, R. 1999. "Labor Markets and Economic Growth". In Ashenfelter, O. and Card, D. editors. *Handbook of Labor Economics*, 3. Amsterdam: Elsevier.

- USAID. 2013. *FIELD Report No. 17: Skills for Jobs for Growth, Effective Human Capital Development in a Changing World of Work*.
- van Gameren, E. 2010. *Evaluación de Impacto del Programa de Apoyo al Empleo*. Mexico City: Centro de Estudios Económicos, El Colegio de Mexico.
- Vera, A. and Castioni, R. 2010. *Los Jóvenes en Latinoamérica: La transición escuela-trabajo como objeto de las políticas públicas*. Boletim Técnico de SENAC, Rio de Janeiro. 30 (2).
- Woessman, L. 2003. *How Does East Asia Achieve Its High Educational Performance?* Royal Economic Society Annual Conference 2003221, Royal Economic Society.
- World Bank. 2003. *Lifelong Learning in the Global Knowledge Economy: Challenges for Developing Countries*. Washington, DC: World Bank.
- . 2012. *The Right Skills for the Job: Rethinking Training Policies, Human Development Perspectives*. Washington, DC: World Bank.
- . 2013a. *Analysis of the Skills Development Sector in Mexico*. Draft February 2013.
- . 2013b. *Mexico Indicators*. Retrieved from <http://data.worldbank.org/country/mexico>.
- . 2013c. *World Development Indicators*. Ranking of GDP by World Bank available online at: <http://databank.worldbank.org/databank/download/GDP.pdf>.
- World Economic Forum. 2014. *Global Competitiveness Index 2013-2014*. Geneva: World Economic Forum.

Inter-American Development Bank