

STEPPING UP SKILLS

For more jobs and higher productivity



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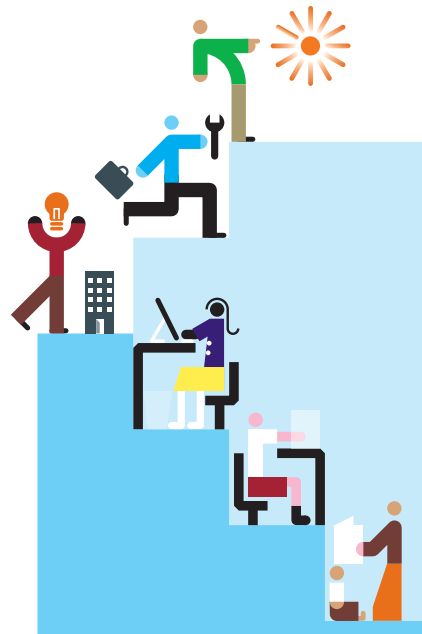
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Preface

Creating jobs and increasing productivity are at the top of agenda for policymakers across the world. For developing countries that are seeking to grow in an inclusive way and reduce poverty, the challenge of expanding employment and productivity is a *sine qua non*.

Skills, and skills development, are an essential component of all efforts in this challenging area. Too many workers are simply unprepared to meet the needs of firms, particularly in more competitive economic environments. Systems to provide training are often plagued by weak governance and poor incentives that make them unreliable or ineffective. Weak incentives and support platforms for innovation and entrepreneurship development can stifle creativity and change.

But the problem is often more complex. In many countries, education systems are not providing young people with the basic skills (cognitive and behavioral) that make them “trainable.” And serious handicaps are inflicted early in life when children are malnourished or insufficiently stimulated. Moreover, rigid labor markets in many countries reduce mobility and make it difficult for workers to find jobs—and for firms to find the right workers.

This report presents a framework –Skills Toward Employment and Productivity (STEP)— that provides a simple yet comprehensive way to look at skills development. It brings together research evidence and practical experience from a range of areas—from research on the determinants of early childhood development and learning outcomes, to policy experience with the reform of vocational and technical education systems and labor markets—and provides a set of powerful messages to policymakers, researchers, and practitioners. The report’s emphasis on performance measurement and benchmarking, policy and program evaluation, and cross-sectoral approaches focusing on individuals throughout their lifecycle provides a solid platform for developing countries to start exploring reforms. The Human Development Network of the World Bank stands ready to support those efforts.

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Stepping up skills for more jobs and higher productivity

The global imperative for more jobs, and more productive jobs, is a major challenge for development. Global unemployment, estimated by the ILO at 212 million in 2009, is at an all-time high. Growth remains sluggish, with output per worker either stagnant or declining in most regions. Young people, particularly vulnerable, have the hardest time finding new jobs, with unemployment rates three times higher than those of adults—and four times higher in South-East Asia and the Middle East and North Africa.

Skills are at the core of improving individuals' employment outcomes and increasing countries' productivity and growth. This is particularly relevant as today's developing and emerging countries seek higher sustained growth rates. Most of them face serious demographic challenges—from a “youth bulge” of new job-seekers in Africa and the Middle East, to a demographic transition of shrinking labor forces in Eastern Europe and Central and East Asia.

Making the most effective use of workers—using all of them, and using them to their greatest productivity—is vital. And while insufficient demand for workers remains a problem in many parts of the developing world, persistently high unemployment rates are partly a function of skills mismatches, the result of workers inadequately equipped for the demands of employers. This is sometimes because of insufficient education, but also because education and training did not provide the skills that employers want. Low returns to work effort—from some forms of self-employment as well as wage work—may be due to inadequate demand for high-productivity work or insufficient complementary factors such as technology and

infrastructure. But low skill levels associated with low-income work are also responsible.

As countries become richer and move up the value-added chain, the skills demanded will change. Bottlenecks will become more evident, constraining growth. Increasingly, labor productivity will depend on high-level cognitive skills (such as analysis, problem solving, and communication) and behavioral skills (such as discipline and work effort). These higher productivity skills are what employers now demand. Evidence from the United States shows that, as economies develop, the demand for interactive and analytical skills in the workplace increases steeply and continually, while that for manual and routine cognitive skills falls. There is also evidence that as middle-income countries become richer, more employers consider skills an important constraint on business development.

In this context, it is indispensable to have comprehensive and adaptive systems to build skills.

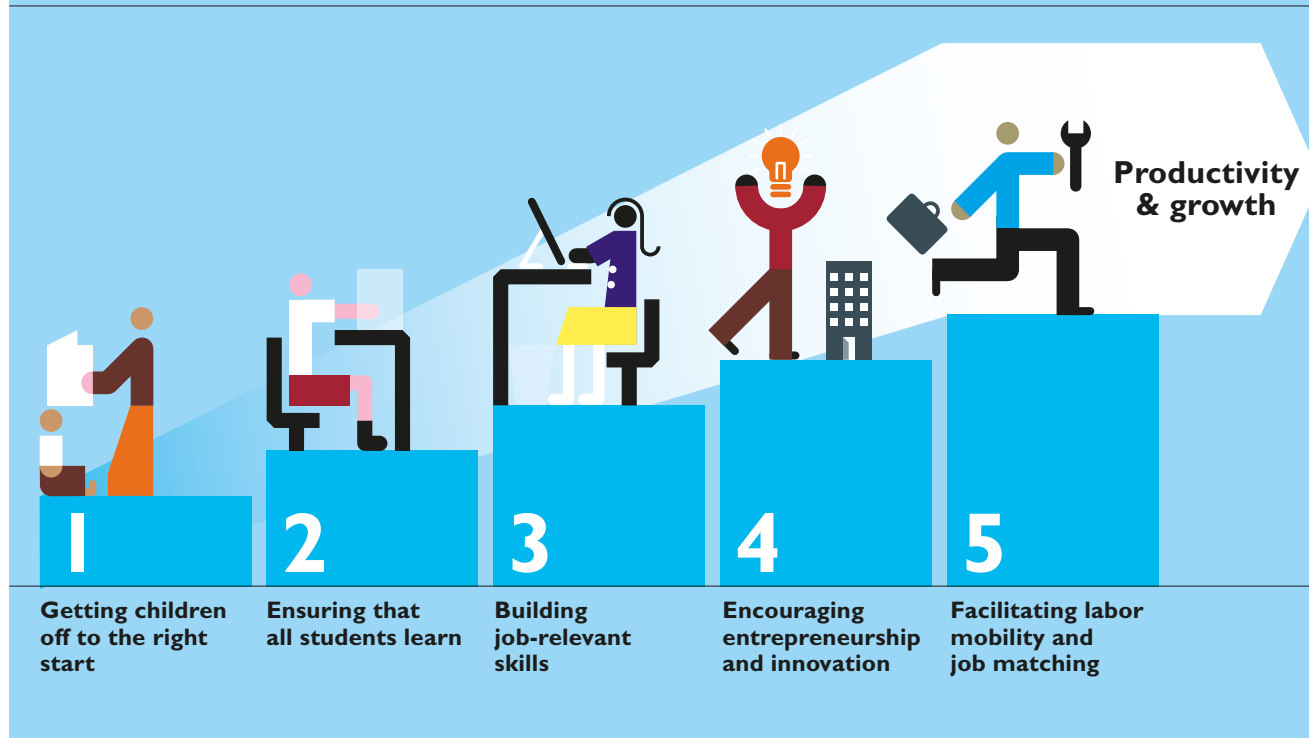
The STEP framework

A simple conceptual framework—Skills Toward Employment and Productivity (STEP)—can help policymakers, analysts, and researchers think through the design of systems to impart skills that enhance productivity and growth (figure 1). Pulling together what is known about the elements of a successful skills development strategy, it can guide the preparation of diagnostic work on skills, and subsequently the design of policies across sectors to create productive employment and promote economic growth. The framework focuses on five interlinked steps:

Step 1. Getting children off to the right start—by developing the technical, cognitive, and behavioral skills conducive to high productivity and flexibility in the work environment through early child development (ECD), emphasizing nutrition, stimulation, and basic cognitive skills. Research shows that the handicaps built early in life are difficult if not impossible to remedy later in life and that effective ECD programs can have a very high payoff.

Step 2. Ensuring that all students learn—by building stronger systems with clear learning standards, good teachers, adequate resources, and a proper regulatory

Figure 1. The STEP framework shows that skills needed for productivity and economic growth require a sequenced combination of education, training, and labor market activities



environment. Lessons from research and ground experience indicate that key decisions about education systems involve how much autonomy to allow and to whom, accountability from whom and for what, and how to assess performance and results.

Step 3. Building job-relevant skills that employers demand—by developing the right incentive framework for both pre-employment and on-the-job training programs and institutions (including higher education). There is accumulating experience showing how public and private efforts can be combined to achieve more relevant and responsive training systems.

Step 4. Encouraging entrepreneurship and innovation—by creating an environment that encourages investments in knowledge and creativity. Emerging evidence shows this demands innovation-specific skills (which can be built starting early in life) and investments to help connecting people with ideas (say, through collaboration between universities and private companies) as well as risk management tools that facilitate innovation.

Step 5. Matching the supply of skills with the demand—by moving toward more flexible, efficient, and secure labor markets. Avoiding rigid job protection regulations while strengthening income protection systems, complemented by efforts to provide information and intermediation services to workers and firms, is the final complementary step transforming skills into actual employment and productivity.

STEP is not a blueprint for reform or a fixed set of recommendations for countries to follow. It is a framework that can help countries understand the challenges they face in building the skills needed for growth and productivity and find the solutions that work in their own environments. It is also a call for a comprehensive approach that resists the temptation of seeking single-minded solutions in the expectation that they will address the skill development gaps.

The value of each individual step is well known to researchers and policymakers. The unique contribution of the STEP framework is to emphasize that building

effective skills for employment and productivity needs to harness the synergies among these steps by recognizing three closely linked elements in building effective skills systems: behavioral skills, path dependence, and labor market clearing.

Behavioral skills

In many economies, employers are searching for workers who possess behavioral skills such as teamwork, diligence, creativity, and entrepreneurship, essential to thrive in today’s rapidly evolving, technologically driven globalized economies. Thus, just improving workers’ technical and vocational skills will not always meet employers’ needs—systems that build skills will also have to ensure that these added behavioral attributes are in place

Path dependence

The efficacy of training later in life is heavily influenced by workers’ early years. Behavioral skills needed for higher productivity jobs, built through learning from families and schools, are difficult to impart later in life. The ability to acquire higher cognitive skills such as creativity and entrepreneurship critically depends on the amount and quality of stimulation and education received

in childhood. As a result, workers who have poor early childhood environments or inadequate or insufficient basic education will be less able to flexibly acquire the higher level skills employers need and are less likely to be employable or fully productive.

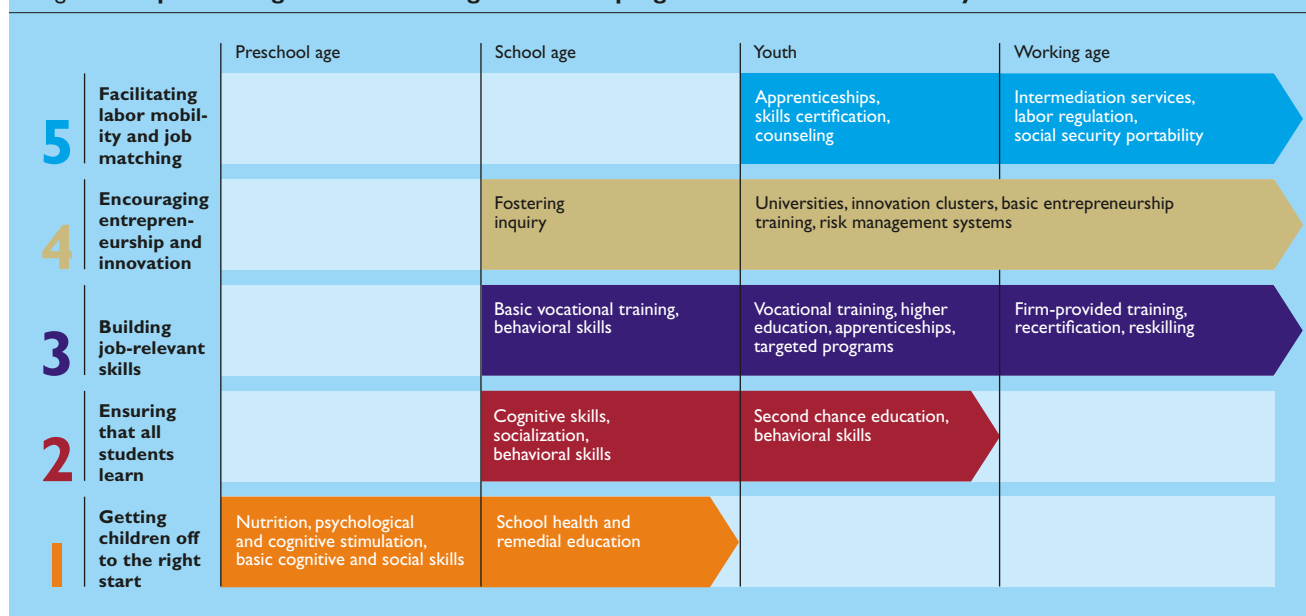
Labor market clearing

Just having the right skills may not be enough—what also matters is having a labor market that fosters finding and using these skills. This may require reforms to the existing labor market regulations and operations—to better match job-seekers and employers and to allow workers to move to higher productivity jobs.

Using the STEP framework

The specific elements of any country’s strategy will depend on its situation, its ambitions, and its constraints in choosing policies. The success of any strategy depends, however, on tying together the five steps of the skills agenda. These steps work across sectors (education, training, labor, social protection, and broader economic policy) and across generations (today’s workers as well as today’s children and youth who could be tomorrow’s

Figure 2. Implementing STEP as an integrated set of programs across workers’ life cycles



skilled workers). And central to building a longer term and sustainable system of skill production are policies targeted toward those held back by inadequate investments in skill formation earlier in their lives.

The STEP framework allows policymakers to design flexible, responsive, and comprehensive systems of skills development that operate in two timeframes:

- In the short run, concentrate on steps 3 and 5, by re-skilling vulnerable workers who are unemployed or underemployed, addressing bottlenecks through flexible training institutions and on the job-training—and creating systems that facilitate job search as well as the search for and hiring of workers with different skill profiles. Step 4 is also part of the mix, building entrepreneurial skills and fostering creativity. But elements of steps 1 and 2 are also important for “second-chance” opportunities for those who may not have received sufficient early childhood development or education.
- In the medium and long runs, improve the entire system producing skills—from the parents to the schools, universities, and training programs. For this, effective policies for early childhood development, education, training and innovation will need to be coordinated with focused labor and social protection policies that facilitate labor participation, mobility, and the matching of skills and jobs. Only then can the supply of skills adjust to continual changes in demand and contribute to productivity, growth, and innovation.

Several specific reforms and programs can be part of a comprehensive agenda (figure 2). They can be targeted at a point in time to populations in different age groups. But they should also form the basis for a longer term program that spans time and builds on the achievements of workers who have benefited from previous steps. And to remedy gaps and avoid leaving the disadvantaged behind, a range of programs—from school health and remedial education to

second-chance education for school dropouts and training programs for unemployed youth—can ensure that country’s human resources are fully used.

What might the STEP framework mean in different contexts? Consider three:

In one country even the basics are not in place. Malnutrition is high, and early childhood development programs are only being set up. The educational system is poor, and many students are completing primary school without learning to read or do math. There, the biggest returns will be from steps 1 and 2. Steps 3 and 4 will still be relevant, but commanding less in the way of budgets and other resources, working at the margins with training for elites and relying more on external resources to fill gaps. Step 5 is not the most binding constraint.

In another country steps 1 and 2 are well covered, except for the poor. But the training and innovation systems are weak because of poor governance and financing. And labor markets, though less than ideal, are functioning. There, more can be done to extend early childhood and school programs in poor areas. And more can be done on matching workers and jobs. But the big returns will come from steps 3 and 4, shaking up the training institutions and dealing with the incentives for innovation. Again, step 5 may be less binding as a constraint.

In a third country labor markets are simply not working—for youths, for a region, or even for the entire country (step 5). So, investments in steps 1–4 will have much lower returns than otherwise. There, more effort has to go toward strengthening institutions, particularly those providing information, and the incentives for workers and employers to match skills offered with skills needed (step 5).

Even where things are mostly right, they might not be right much of the time. So if there’s a backlog of kids performing poorly, the message is “fix it.” And if people have missed out in taking one of the steps, it should be a priority to give them a second chance—by identifying their needs and targeting programs that help them take the next step.



Step 1

Getting children off to the right start

Problem: Failing to invest in ECD is costly, if not impossible, to compensate for later in life

The skills developed in early childhood—from birth to primary school entry—form the basis of future learning and labor market success. Early childhood development (ECD) enhances a child’s ability to learn, to work with others, to be patient, and to develop a wide range of other foundational skills for formal learning and interactions in the school years and beyond.

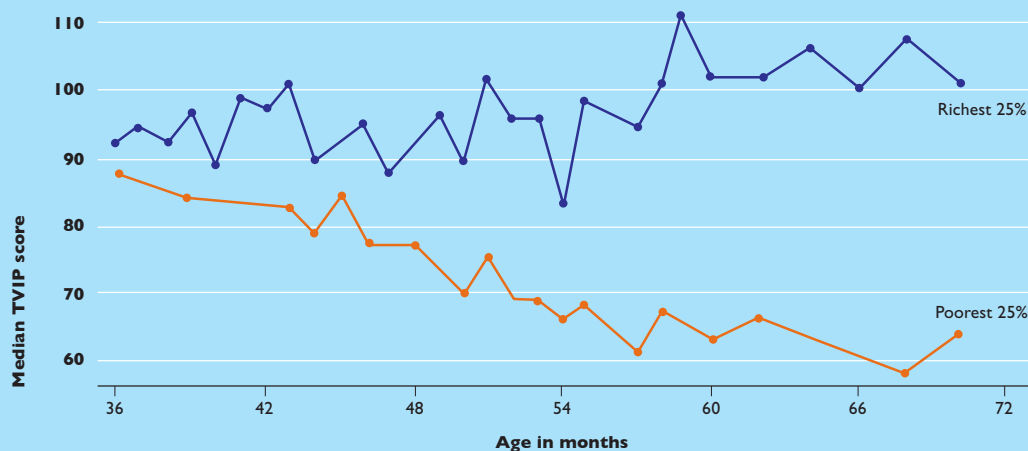
A failure to develop these skills can lead to long-term and often irreversible effects on education, health, and

productive earnings, imposing significant costs for both individuals and societies. Studies from Brazil, Indonesia, Jamaica, Peru, the Philippines, and South Africa show that inadequate nutrition between conception and age 2 leads to serious cognitive delays among school-age children.¹ And linguistic and cognitive delays can accumulate rapidly if not addressed. For example, while differences in age-adjusted vocabulary among 3-year-old Ecuadorian children are generally small, by age 6 children in less wealthy or less educated households have fallen far behind their counterparts in wealthier or more educated households (figure 3). Why? Because poor children tend to receive less child directed speech, and because the speech they hear tends to have reduced lexical richness and sentence complexity.²

Associations between poverty and cognitive, physical, and socio-emotional areas of child development were also recorded at as early as 6 months of age in Egypt, 10 months in India, 12 months in Brazil, and 18 months in Bangladesh.³

The window of opportunity is small because these foundational skills are best formed in the early years. Failing to invest in them is costly to compensate for later in life, if not impossible, as is the stunting from poor early nutrition or the excessive pruning of brain connections

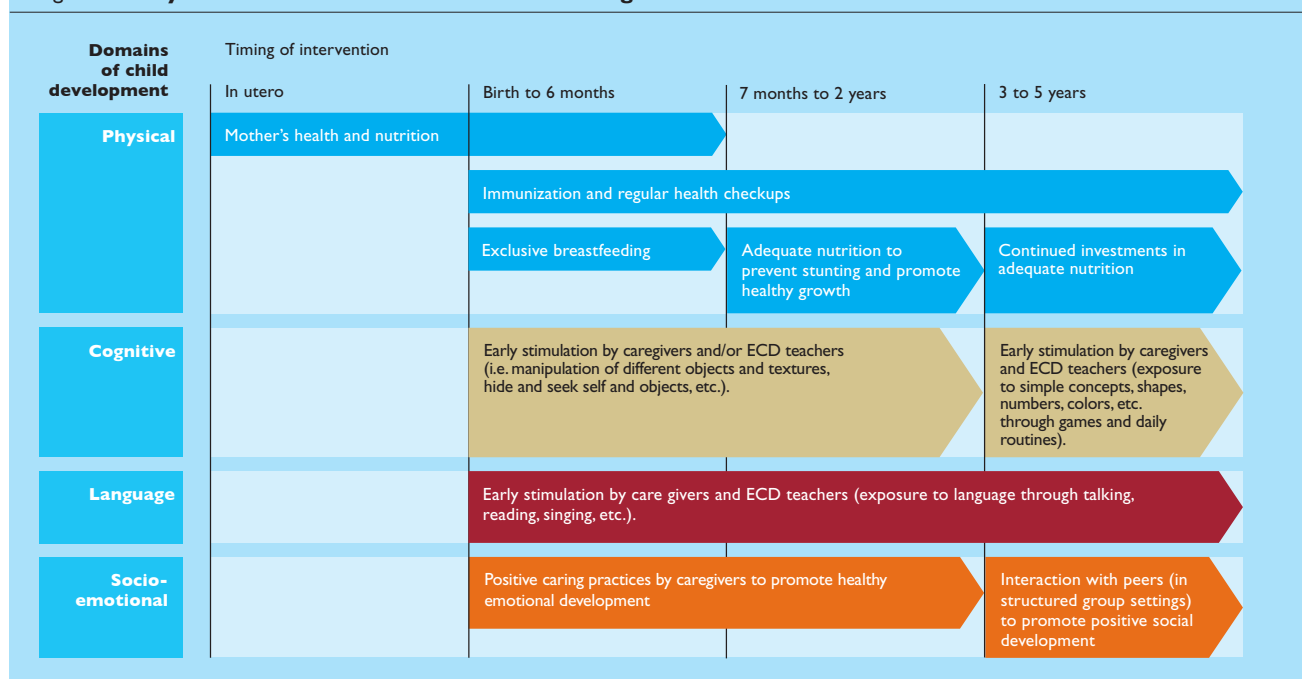
Figure 3. **By age 6 Ecuadorian children in less wealthy or less educated households have fallen far behind their counterparts in wealthier or more educated households—permanently**



Source: Schady N., and Paxson C. (2005). Cognitive development among young children in Ecuador: the roles of health, wealth and parenting. *World Bank Policy Research Working Paper 3605*, May, 2005. Washington DC: World Bank.

Note: TVIP stands for Test de Vocabulario en Imágenes Peabody.

Figure 4. Early childhood interventions at different ages



from a lack of cognitive and socio-emotional stimulation. And a weak set of skills and abilities reduces the returns to investments later in life.

How to prevent these unhappy outcomes? With a range of early childhood development interventions.

Defining ECD concepts and interventions

ECD programs enhance the physical, cognitive, socio-emotional, and linguistic development of children from conception to primary school entry. Optimal investments in each area of ECD are required at each age:

- Ensuring the health and nutrition of the pregnant and lactating mother can ensure good physical development of the fetus and good breast milk. This is most important from conception to the first 6 months of life. Interventions include prenatal care, vitamin supplements, and counseling mothers in nutrition and breastfeeding.
- Immunizations and regular health checkups should start at birth and continue through age 6.
- Breastfeeding for very young infants is desired because of its nutritional and protective benefits. Depending

on the context, the longer the breastfeeding, the better for the infant, though solid foods are expected to be introduced by the age of 6 months.⁴

- With cognitive stimulation by caregivers or teachers, a child benefits from exposure to shapes, numbers, and formal ideas starting at age 3.
- For linguistic stimulation, caregivers should talk to, read to, sing to, and verbally interact with children starting at birth.
- Healthy emotional development begins at birth through the presence of and communication to the child of a caring environment long before he or she can express such emotions. Such practices include holding and touching the child, making eye contact, and communicating a safe environment.
- By age 3, children learn to interact and negotiate with their peers. If these skills are not learned in early childhood, they are difficult to learn later in life.

Delivering the whole package is most efficient since each domain supports the successful development of other domains. By age 6, the well-developed child should be

physically, cognitively, and socio-emotionally ready to enter primary school. Any areas of deficiency are difficult, if not impossible, to remedy later in life.

ECD services can be delivered through various channels, largely dependent on the dimension of the package and the context. The most common channels are:

- **Center-based.** Preschools are perhaps the best understood delivery mechanism. Those focused on child development work with children and their parents on all domains of ECD. Since centers offer peer interactions that are less available in the home, it is strongly recommended that children aged 3–6 participate in preschools. For example, the preschool program in Mozambique enrolls vulnerable children aged 3–5—those living amid high levels of poverty or affected by HIV/AIDS—and provides them with a high-quality but low-cost and fiscally scalable center-based preschool education. Community volunteers, including two teachers per classroom, focus on cognitive stimulation through games, art, and music, as well as on basic math, reading, and Portuguese to prepare the children for elementary school. The program also encourages good health, nutrition, and hygiene through parent and caregiver training.
- **Public health centers.** While these centers often focus on physical development, they also measure development in other domains and counsel caregivers on linguistic and socio-emotional stimulation and overall care.
- **Counseling.** This service may be center-based or provided in the home. The social worker provides classes for parents, usually mothers, on the proper feeding of children, the importance and process for immunizations, the provision of socio-emotional stimulation, and cognitive development. This training can begin before the child is born. For example, Mexico's Consejo Nacional para el Fomento Educativo (CONAFE) trains parents and caregivers of children aged 0–4 to improve their skills and practices in caring for children. These classes take place in preschools and public spaces. The program mobilizes a network of volunteers to teach sessions, keeping annual costs low. Preliminary evidence indicates greater attention

and support by the parents who participated in the program, and an easier-than-expected transition to preschool by their children.

- **Peer-to-peer learning.** Also a form of counseling, this intervention provides training to community members who share information about the various forms of care with community groups. In Cambodia, a new home-based ECD program in 450 communities uses mother-to-mother communication to strengthen the role of parents as prime educators and to enhance early learning of children through parental engagement at home.
- **Media campaigns.** Through radio, television, and posters, information about proper care and stimulation of children can be shared with a broad and dispersed population.

These types of interventions may be offered by the public or private sectors, be publicly or privately funded, and be implemented by any social ministry.

The lifelong benefits of quality ECD

Strong evidence from around the world shows the impact of ECD throughout the lifetime. Children who participate in quality ECD programs have higher cognitive development and overall school readiness on primary school entry, lower repetition and dropout rates in the early grades, greater learning in school, and higher school completion rates. Some examples:

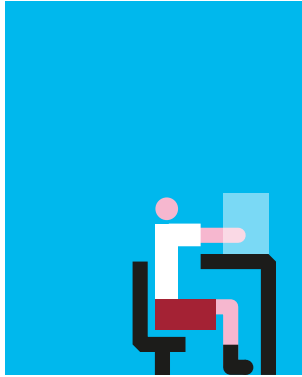
- In Bangladesh, children who received center-based preschool education outperformed their peers in the control group by 58% on a standardized test of school readiness.⁵
- In Colombia, children who received a comprehensive community-based ECD intervention were 100% more likely to be enrolled in third grade, indicating lower dropout and repetition rates for program children than for those in the control group.⁶
- In Argentina, one year of preschool was estimated to increase the average third-grade test score in mathematics and Spanish by 8%.⁷
- In Turkey, children who benefited from a mother-child education program that provided cognitive enrichment to children and training and support for mothers were

more likely to be in school during their teenage years than those in the control group (86% compared with 67%).⁸

- And in the United States children who received high-quality, comprehensive ECD services were 50% more likely to finish secondary school than those who did not.⁹

These positive outcomes reach far beyond childhood and affect labor productivity. By age 27, children in the United States who took part in a center-based ECD intervention, supplemented by parental training, were 20 percentage points more likely to be earning more than \$2,000 a month than the control group. One-third of the program beneficiaries owned homes by age 27, more than twice the 13% for children in the control group.¹⁰

ECD interventions are among the most cost-effective investments a country can make in its people. OECD countries already spend, on average, 2.3% of GDP on services for families and children aged 0 to 6 years. It has been proposed that all countries should spend at least 1% of GDP on ECD to ensure quality services.¹¹ Some evidence suggests annual rates of return of 7–16%.^{12,13} Not only do quality ECD investments have a high benefit-cost ratio, they also have a higher rate of return for each dollar invested than interventions directed at older children and adults.¹⁴ So, ECD investments should be a top priority for efforts to promote employment and productivity later in life in many countries—and for the poorest and most disadvantaged groups in all countries.



Step 2

Ensuring that all students learn

Problem: Many more in school—but not learning

Schools are expected to teach basic competencies that enable students to acquire the skills that would help them make informed life choices and that would later be valued by employers and useful for self-employment. In fact, the seeds of these competencies should have been planted from infancy, and schools should develop them. These competencies include (see box 1 in step 3 for definitions):

- *Problem-solving skills.*
- *Learning skills.*
- *Communication skills.*
- *Personal skills.*
- *Social skills.*

In addition to these basic competencies, skills that are more directly required for work can be developed through schooling:

- *Cognitive skills* as demonstrated by an intellectual grasp of the subject matter of various academic subjects such as language, mathematics, various pure and applied sciences, and the social sciences.
- *Psychomotor skills* for the tasks to be performed in an occupation, job or business (operating a lathe or a weaving loom, preparing architectural plans, installing equipment) and the ability to apply the skills in practice.
- *Affective skills* relating to a person's attitudes toward timeliness, accuracy, and general commitment to quality and performance, and perception of the meaning and value of work, concept of self and others.

The lists illustrate the multiple dimensions of job-relevant skills that go beyond simple book learning and

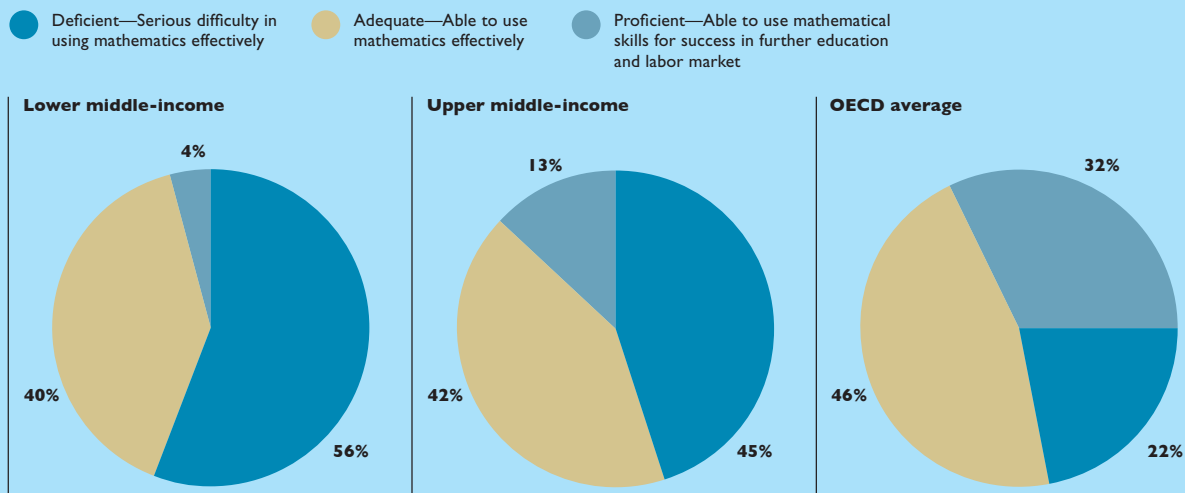
the ability to execute a specific task. But information on learning outcomes indicates that schools in many developing countries are failing to teach foundational cognitive skills, much less the “expert thinking and complex communication” and occupational skills needed to function effectively in the modern labor market.¹⁵ Consider the evidence that significant numbers of students do not achieve minimum levels of learning expected. Recent early grade reading tests reveal that shockingly low proportions of primary-graders in many low-income countries can read a simple sentence with ease and comprehension, making it very difficult for these students to catch up in later grades.¹⁶ In early grade reading tests given to a few anglophone African countries, second-graders performed well below the fifth percentile of U. S. norms.¹⁷

This is corroborated by evidence from other countries. Despite having been in school for 2-5 years, a significant percentage of school children in South Asia could not read (only 25% after three years) or do basic arithmetic (only 32% could solve subtraction problems).¹⁸ Similarly, in many other low-income countries, fourth-graders perform only at about one-half of the minimum mastery level expected for similar cognitive functions.¹⁹ And the picture is rather bleak even in middle-income countries. Only 4% of 15-year-old students in lower middle-income countries and only 13% in upper middle-income countries are proficient enough in math to succeed in further education and in work (figure 5). By contrast, 32% of OECD students are proficient.

With so many students not learning, higher enrollment rates will not necessarily translate into productivity gains for workers or economic growth. This is a huge opportunity lost. Education remains one of the most powerful instruments for improving lives, reducing poverty and ultimately laying the foundation for economic growth.²⁰ For individuals, one additional year of schooling raises earnings by 10–20% in low-income countries.²¹ And better quality schooling raises earnings even more.²² Improving the quality of education improves students' performance on tests in the short run²³ and labor market success in the medium run²⁴—and contributes to sustained economic growth in the longer run.²⁵

It would be too much to ask that most students in developing countries be at levels approaching the OECD's

Figure 5. **Roughly half the students in middle-income countries lack the math skills to succeed in further education or work — PISA 2006**



Source: Programme for International Student Assessment.

top benchmarks. But most systems should rapidly increase the number of students capable of more than the least complex reading tasks, such as locating a single piece of information, identifying the main theme of a text, or making a simple connection with everyday knowledge, and doing simple math. In fact, a young person needs far more than these basic skills. Achieving only the most basic knowledge and skills, youth may have difficulties in navigating life’s challenges and performing well in the world of work. This is the case even for youth who will remain in farm work. Consider, for example, the skills required to participate successfully in recent initiatives to use cell phones to help smallholder farmers obtain on-demand, up-to-date market, production, transport and meteorological data.²⁶ These initiatives help small farmers by reducing information costs which can represent upwards of 10% of their total costs and up to 70% of their transactional costs.²⁷ Farmers who have higher skills are better able to process codified and complex information, and thus benefit more fully from innovative programs such as these.

Developing countries have made great progress in expanding supply and ensuring access to schools, including for disadvantaged children. In addition, they have used interventions, such as the abolition of school

fees and scholarships, cash transfers to compensate for the opportunity cost of school attendance, and vouchers that give poor students the choice to use privately provided services, that can strengthen demand for education, thus raising enrollments and reducing schooling inequalities.²⁸ Together, these measures account for notable increases in enrollment rates at the primary and secondary education levels. Now countries need to ensure that “schooled” youth leave school with useful, robust skills. Whether from inadequate or misused educational investment, poor teaching, or ineffective systems, poor learning wastes both public and private resources. It leads to higher repetition, failure and dropout rates, and lower completion and transition rates. Ultimately, poor learning outcomes also limit a country’s potential for economic growth.

What policies improve learning?

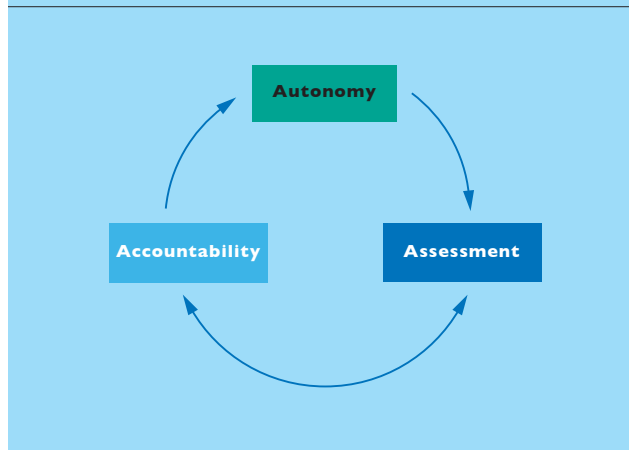
Traditional policies and programs that focus on inputs regardless of outcomes are likely to be wasteful and ineffective. In contrast, those that measure results, address systemic issues and support a long-term vision are likely to succeed. The building blocks of an education system are learning standards, good teachers, adequate resources, and

a proper regulatory environment. But to enhance system performance, these building blocks should be connected through an integrated system of incentives, rewards, and sanctions (figure 6).

- **Standards.** By defining clearly the knowledge and skills that students are expected to gain, they will better understand what is expected of them, schools will cater their programs accordingly, teachers will know what they will be held accountable for, and school managers will be challenged to seek the means to raise the level of teaching and learning.
- **Teachers.** Most teacher-related investments focus on pre- and in-service training, but to improve the teaching force, policies must not only establish and enforce proper qualifications (through training and support services) but also provide teachers the incentives for good performance.
- **Resources.** Without adequate resources for key inputs, it is hard to achieve the standards and goals set for a school system. But also as important as spending levels are the proper allocation of resources to different uses, equitable distribution across schools, and management that minimizes waste and leakage.
- **Regulatory environment.** Managing the various inputs requires monitoring and control to ensure adequate provision. This demands a regulatory environment that encourages good governance, has clear criteria for establishing schools, establishes mechanisms that allow for choice and voice, and promotes equity in financing and results.

One building block that could be added to this list is often forgotten—the physical and mental readiness of students to learn. For example, research shows that youth with disabilities are substantially less likely to start school, and in some countries have lower transition rates resulting in lower schooling attainment. This association is often larger than that with respect to characteristics such as gender, rural residence, or even economic status, and warrant policy attention.²⁹ Investments in a child’s early nutritional and health status make for a good start in life, but children continue to face many health risks into their adolescence, including infectious diseases, hunger and malnutrition, violence, drug and alcohol abuse, and early

Figure 6. **Linking the 3As with incentives and consequences**



pregnancy. Schools can provide some measure of protection by teaching students about hygiene, good eating habits, the dangers of substance abuse, and safe sex. Schools are also a ready-made center for delivering child and adolescent nutrition and health services. For instance, research on the impact of a deworming program in Kenya shows a drop in school absenteeism among the deworming treatment group by approximately one-quarter (or seven percentage points), on average.³⁰ Worm infections are particularly prevalent among school-age children in many developing countries, and addressing these infections is said to be one of the most cost-effective ways of reducing student absenteeism.

How best to govern, manage and finance these building blocks present difficult challenges for decision-makers, particularly when relevant information about systems and about program impact are unreliable, late or altogether absent. Lessons from research and ground experience indicate that the key decisions about education systems can be grouped into three: how much autonomy to allow and to whom, accountability from whom and for what, and how to assess performance and results (the 3As).³¹

- **Autonomy.** Students and teachers perform best in a climate of high expectations supported by strong teacher-student relations so that students and their teachers are ready to invest effort. Greater autonomy can give schools the flexibility to empower teachers and parents, thus improving teacher morale. In countries that perform well, local authorities and schools have

substantial responsibility for educational content and resource use. But efforts to move more decision-making to the local level need support from the center in matters of evaluation and assistance for weaker schools.

- **Accountability.** To improve learning, school autonomy must be accompanied by an accountability framework that enhances community and parental interest.³² Accountability contributes to quality by involving the stakeholders and by setting clear goals and standards for the system. If schools and students are responsible for results, they will ensure that homework is done, that students and teachers are in class, that pedagogy is appropriate, and that administrators acquire the appropriate school inputs.
- **Assessment.** If greater autonomy and accountability are to lead to policies for quality, measures of learning outcomes are essential. High-performing countries use information to constantly focus on improvements over time. Good examples are Korea and Singapore, where sustained, smart reforms and systematic use of outcome data have propelled significant achievements. To assess system performance, countries usually rely on national standardized tests, and for cross-country comparisons, on regional or international achievement tests (e.g. PIRLS, PISA, TIMSS)—although many developing countries still do not use these instruments to assess their school system. Such tests complement the easier-to-measure enrollment, repetition, dropout, and completion rates. But measurement is only half the battle. Countries should also strengthen their capacity to analyze and understand results, engage in policy debate using those results, and feed the results back as information into policymaking.

Focusing on the 3As will help improve the quality of education and increase learning, making other policy actions more effective.

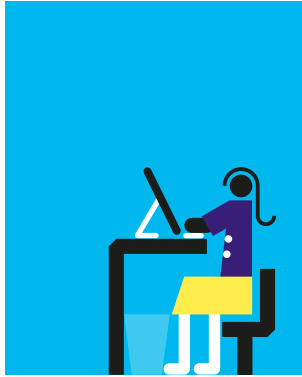
Promoting learning: A few cases of success

There is no magic bullet for achieving system-wide success, but several countries have achieved significant gains by using student assessments, implementing curricular change,

and giving schools more autonomy. Lithuania increased test scores by 34 points in mathematics and 55 points in science in the TIMSS between 1995 and 2007. During this period, it reformed its curriculum on the basis of national standards, gave teachers more autonomy in the classroom, and introduced a new system of financing education. Likewise, Poland improved its PISA scores by 25 points in math and 28 points in reading between 2000 and 2006. Its 1999 reforms focused on improvements in the quality of teaching, administration and supervision, and on curricular reform and independent assessment and examination.³³

Lower-income countries with lower enrollment rates and achievement levels have also made progress by focusing on their goals for both enrollments and learning. They have adopted national and international benchmarking as a way to monitor results. For example, in India the school report cards developed by the District Information System for Education summarize school information in an easy to read format, allowing parents and stakeholders access to information not previously available to hold schools and authorities to account. The data from the report cards are available on the Web, a potentially powerful tool for local accountability.³⁴ Ghana witnessed a 34-point increase in its TIMSS score between 2003 and 2007. This large increase was accompanied by a 35% increase in the enrollment of eighth graders.³⁵ Jordan increased science scores by 30-points in the TIMSS between 1999 and 2007, at the same time that net enrollment in primary education increased by 9% and the transition rate to secondary increased by 25%. It achieved both quantity and quality improvements through a cluster of reforms that included international benchmarking, along with national testing, curricular reform, teacher training, and regular feedback between research and policy.

If effective, schools lay the foundational skills for youth to be productive and creative workers, securing for them opportunities to live well and contribute to their communities. These skills are broader than those that are currently being measured in developing countries because they include also teamwork, communication, and the ability to innovate and solve problems. But countries' efforts today to measure reading comprehension levels, arithmetic acumen, and science understanding are a step in the right direction.



Step 3

Building job-relevant skills

Problem: Skills bottlenecks strangle productivity

Enterprise surveys by the World Bank since 2000 in some 90 countries—several covered by repeated surveys—suggest that skills constraints impede firm performance, particularly in more dynamic environments. The share of firms worried about inadequate worker education and skills averages about 25% in the Organization for Economic Cooperation and Development and in Europe and Central Asia, 40% in Sub-Saharan Africa, and 50% in East Asia and the Pacific. Even in Europe and Central Asia, where the countries have enjoyed a legacy of high skill endowments, the great majority of firms surveyed in 2008 considered deficits in education and skills to be a major or severe constraint.³⁶

Skills bottlenecks are likely to worsen in the coming years. According to the enterprise surveys, employer complaints about skills are more often voiced by firms that are newer, faster-growing, more outwardly oriented, and more eager to move up the technology ladder. In Turkey, employers in small and medium enterprises—even in the more labor-intensive sectors such as furniture, food processing, textiles, and clothing—cite the inadequacy of skills at all levels as a key constraint on their capacity to acquire and use new and more advanced technology.³⁷ In Vietnam a sustained shift in employment from agriculture to manufacturing, coupled with capital accumulation and skills-biased technological change, fueled a strong demand for workers with higher skills—those produced through a university education—and raised the return to tertiary education to 10% in 2004, far above that at all other levels of education.³⁸

In low-income countries—where agriculture and the informal economy dominate the economic landscape—skill constraints are one reason for persistent low productivity and earnings.³⁹ The situation is especially dire in Sub-Saharan Africa as rapid population growth pushes farmers into less productive lands and accelerates migration to the cities, where new arrivals outpace new jobs.

In agriculture, Ethiopia, Kenya, Uganda, and Rwanda are trying to raise productivity through higher value exports, such as cut flowers, horticultural produce, processed fish, and specialized coffees. But inadequacies in a range of skills—technical, scientific, managerial, and entrepreneurial—impede progress up the value chain and reduce the potential for pursuing newer and more lucrative opportunities (such as biofuels, medicinal plants, green technology).

In urban areas, the majority of people in low-income countries and sizable shares in lower middle-income countries, particularly in the Middle East, make a living in low-skilled and low-paid jobs, if they have one.⁴⁰ Many of them find themselves in precarious situations, with few opportunities to upgrade or expand their competencies. Their skill deficit adds to other constraints that keep productivity low and incomes low and unpredictable.

The payoffs to training in job-relevant skills

Addressing skills bottlenecks can raise firm productivity and workers' wages. In Britain, Mexico, and Malaysia longitudinal surveys of firms have established a causal link between investing in training and firm productivity. Moreover, firms in Malaysia and Mexico that trained their employees repeatedly enjoyed faster productivity growth than firms that either did not train or invested only in one-off training, particularly when the firms also invested in new technology.⁴¹ Evidence from cross-sectional data for a larger set of countries is consistent with these findings (table 1), though the estimates are less robust because the better firms are also more likely to train, which makes it difficult to isolate the impact of training.

Evidence of the impact of training on individuals' employability and productivity is also encouraging, if somewhat tentative because of data limitations. Even so, data from various labor force surveys reveal that the returns to training can be positive and statistically significant, averaging

Table 1. Impact of in-service training on firm productivity in selected countries

	(% increase in value added)
China (2001)	32
Guatemala (1999)	49
India (2000)	27
India (2004)	16
Malaysia (1994)	28
Mexico (1992)	44
Morocco (2002)	29
Nicaragua (2000)	56
Pakistan (2004)	67
Russia (2005)	22
Sri Lanka (2002)	36

Source: Data for China, Guatemala, Malaysia, Mexico, Morocco, and Nicaragua from Tan 2006; for Russia from Tan and others 2007; and for Pakistan, India, and Sri Lanka from Riboud 2007.

about 8% in India (2004) and Pakistan (2004), 17% in Sri Lanka (2002), 10–13% in Singapore (1998), about 12.5% in Rwanda (1999–2001), and 8–14% in Tanzania (1997–2000).⁴² A 2005 survey in India demonstrates that being fluent in English, a business language, increased men’s hourly wages by 34% relative to those who speak no English, as high as the return to completing secondary school and half the return to completing an undergraduate degree. Being able to speak a little English raised wages by 13%.⁴³

Elsewhere, youth training and employment programs are being launched in several African countries, among them the Uganda Youth Opportunities Program. Groups of 15–30 youths were selected through a random process with input from community leaders and given grants for each group to purchase vocational training and equipment to operate in their chosen trade. The early results suggest that the approach has, among other positive outcomes, led to a 150% increase in the probability of working in the trade, a 135% increase in hours worked, and an 18% increase in last week’s and last month’s income.

Challenges in building job-relevant skills through training

Market failures in skill formation are common, and many governments intervene to minimize the risk of

Box 1. What are job-relevant skills?

Job-relevant skills refer to a set of competencies valued by employers and useful for self-employment. They include skills relevant to the specific job of the worker as well as other skills that enhance his or her productivity. These other skills include:

- *Problem-solving skills* or the capacity to think critically and analyze.
- *Learning skills* or the ability to acquire new knowledge (“learning to learn”), distill lessons from experience, and apply them in search of innovations.
- *Communication skills*, including reading and writing, collecting and using information to communicate with others, and using a foreign language and information and communication technologies (ICTs) as communication tools.
- *Personal skills* for self-management, making sound judgments, and managing risks.
- *Social skills* to collaborate with and motivate others in a team, manage client relations, exercise leadership, resolve conflicts, and develop social networks.

underinvestments in training. The instruments typically involve the governance of training provision, the public financing of training, and the way information about training services and their outcomes is generated and packaged to inform trainees, employers, and other key stakeholders. These aspects of policy design influence the incentives of individuals and firms to invest in skills and shape those of training providers to deliver effective and responsive services.

There are basically two junctures when the training occurs: before employment and on-the-job. The training includes instruction in classrooms, laboratories, workshops, apprenticeship arrangements, and internships. Country conditions and the occupation influence the choice of these options, but the contribution of both pre-employment and on-the-job training can be improved to promote job-relevant skills and align them more closely to demand signals from the labor market.

Pre-employment skills development. Perhaps the most frequent complaint, especially about public institutions that offer TVET, is that the system produces the same graduates

Box 2. The diverse field of technical and vocational education and training

Technical and vocational education and training (TVET) programs are highly diverse in the competencies they impart. Their entry requirements also vary greatly, from the fairly modest (courses on simple welding jobs), to the moderately demanding (courses for tool and die makers, aerospace-certified welders, air traffic controllers, high voltage technicians), to the highly demanding (courses for engineers, designers, scientists, neurosurgeons). The diversity implies that training occurs in a correspondingly wide variety of settings: in schools that offer TVET courses and in post-secondary institutions such as community colleges, polytechnics, universities and other specialized institutes (and indeed in overseas institutions in esoteric fields).

The courses offered at universities are generally viewed as professional training rather than TVET; the training of teachers (and sometimes that of health workers, including doctors) is treated likewise. The term TVET is thus often used tacitly to refer to the training of other workers, with vocational training typically assumed to be geared to trainees expecting jobs as skilled workers at the lower to mid-level, and technical training mostly directed at those aiming for skilled jobs at higher levels of responsibility.

year after year with little regard to labor market signals and the skills listed in box 1. In addition, costs are high, public support is weak for what is considered a poor route to jobs, and the curriculum is often narrowly geared toward jobs in the formal sector, which in most low-income countries is tiny and not growing fast enough to offer many new jobs.

Because country conditions differ, there is no ideal reform package to balance the supply of skills imparted through pre-employment training programs and the employer demand for skills. The challenge is creating the environment for providers of training to have the incentives to respond to the needs of the labor market.

In Singapore, sustained effort over the years has shaped a well-functioning system of pre-employment training adapted to the country's needs.⁴⁴ The Institute of Technical Education (ITE), established in 1992 as a statutory board under the Ministry of Education, caters to 25% of each cohort of 10th-grade completers with weaker academic abilities (about 25,000 students in 2007). The ministry holds ITE accountable for graduates' employment, among

other agreed results, but grants it substantial autonomy under guidance from a board of governors, whose members include business leaders. This governance arrangement has prompted ITE to use business-like practices to ensure efficient services and effective pedagogical approaches, forge and sustain productive ties with industry, routinely report on graduates' and employers' satisfaction with its services through surveys, and "brand" ITE skills through a certification system that employers trust and use.

In some countries, the reforms may be more recent or less comprehensive, but the headway is no less impressive. Botswana, Lesotho, and Vietnam have allowed new tertiary level institutions under public-private partnerships to emerge in response to the demand for high-quality employment-oriented training. To expand training opportunities for those working in the informal economy, Benin, Tunisia, Egypt, and Morocco have set up modern apprenticeship schemes and achieved some progress, albeit not yet on a systemwide scale.⁴⁵

A notable innovation in Latin America is the spread of demand-driven training models. Chile's Joven program, which started in 1992 based on youth training experiences in Great Britain and the United States, has been particularly influential. It inspired similar programs in at least eight other countries in the region, many of them mainstreamed into national training systems. The Joven's three defining features are targeting disadvantaged youth, enhancing participants' social skills to prepare them for jobs, including a requirement for participating providers to arrange for work internships, and relying on a competitive process to select training providers.

On-the-job training. OJT contributes much to the stock of human capital, with estimates ranging from a quarter to half of all human capital formation in the United States.⁴⁶ It tends to favor workers with higher levels of educational attainment and occurs more frequently in larger firms and in more dynamic, export-oriented sectors. The bias often puts countries in a paradox, with firms complaining about skill shortages while also being unwilling or unable to upgrade their own workers' skills through OJT. The problem is particularly prevalent in South Asia and the Middle East and North Africa, and to a lesser extent in Sub-Saharan Africa.

Box 3. Tertiary education, a critical part of a skills building system

Tertiary education helps countries become more globally competitive by developing a skilled, productive, and flexible labor force and by creating, applying, and spreading new ideas and technologies. Yet in many low- and middle-income countries, tertiary education systems intended to bring about these benefits are often dysfunctional, inequitable, and inefficient, generating low-quality learning outcomes.

Public expenditure on tertiary education relative to other levels of education remains disproportionately high, with about 20–30% of the education budget. While tertiary education is generally more costly to produce, the expenditure is still largely inefficient and regressive. Enrollments are often low and in most countries largely confined to individuals of higher socioeconomic status. Completion rates are low too, with only a fraction of entrants completing their program of studies, making for inefficient and wasteful systems. Quality, measured by research output and by international rankings of universities, also tends to be low relative to industrial countries. In many countries, the private sector is emerging rapidly to absorb demand, but such growth often occurs with too little check on the quality and relevance of outcomes.

Problems of poor management abound. Many tertiary education institutions are autonomous on paper. But they lack the range of management capacities to behave autonomously—incapable of modifying their institutional practices to improve results and accountability to stakeholders. Inappropriate governance and financing mechanisms are pervasive in tertiary education worldwide, preventing institutions and systems from being agile enough to respond rapidly and appropriately to stakeholder needs or to reform practices for greater efficiency, equity, and quality.

Reforming the higher education system, a critical part of efforts to improve the production of job-relevant skills, typically involves actions on many fronts, including changes in financing and governance and closer coordination with other parts of the education system.

Smaller firms in most countries are reluctant to provide training on the job, for fear of losing trained workers to other firms and for lack of access to credit and information about training. An unfavorable business environment acts as a further impediment by weakening firm incentives to compete, innovate, and train workers. But even under more favorable environments, firms and workers may still underinvest in skills. In such cases, financial incentives

can foster OJT. In low-income settings or for the informal sector, traditional apprenticeships can be an option. In Benin, Kenya, Ghana, and other countries in Africa, they are a significant source of skills for employment in both the formal and informal sectors.

To ensure OJT in smaller firms, Brazil, Chile, Malaysia, Mexico, and Singapore collect payroll levies and use the funds to encourage small and medium-sized enterprises to invest in worker training. A common design challenge is to avoid subsidizing OJT that enterprises would have conducted without the financial incentives and to ensure that OJT investments are cost-effective in producing the desired training outcomes. Mexico's Integral Quality and Modernization (CIMO) Program, established in 1988, has been particularly successful. By 2000 it was helping 80,000 enterprises each year with a package of training and industrial extension services and training 200,000 employees. And more than 300 business associations were participating in CIMO, up from 72 when it started. Evaluations found that companies that received CIMO services invested more than others in training their workers, used their production capacity more fully, adopted quality control practices more frequently, and raised their productivity and profitability. CIMO had a particularly large impact among very small firms.⁴⁷

For most large and well-established firms, OJT is often so productive that they invest in it with little government intervention. Examples of such initiatives can be found in India's leading companies. Infosys, a software technology giant, completed a new 300-faculty Global Education Center in 2009 with a training capacity of 14,000 seats, dedicated to enhancing the competency of its staff.⁴⁸ In Malaysia, the Penang Skills Development Center is a partnership of several enterprises coming together to benefit from industry-specified training services financed through membership subscriptions, fees, and a government subsidy. Its 17-year success has inspired the setting up of the Chittagong Skills Development Center in Bangladesh. The Ghana Industrial Skills Development Center, yet another industry-led training example, was formed through a partnership of private firms, government, and donors to support the country's budding manufacturing sector.

Skills certification systems. One important aspect of a strategy to facilitate and promote the acquisition of job-

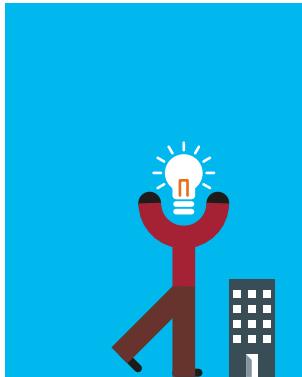
relevant skills involves a framework for workers and firms to have clear information on those skills and on acceptable standards. Skills certification has become important to employers as a quality assurance mechanism that recognizes and certifies an individual's skills and competencies.

Skills certification is often referred to as competency-based certification. As modes and pathways of learning become more diverse, skills certification fulfills many objectives. First, it recognizes skills and competencies regardless of the way in which they were acquired or of the job-seekers' educational background. Second, it allows employers to compare individuals' skills across the labor market. Third, it is a way to match the skills acquired through training or other means with the skills required to perform a job. Fourth, its less immediate objectives are to increase occupational mobility, promote lifelong learning, and enable international and intergenerational comparative analysis.

Often, skills certification can be organized in a national qualification framework, which defines a single set of criteria for specified levels of learning and thus increases

transparency and eases recognition of qualifications by labor market participants.

An example of an integrated approach to skills certification is Chile's Califica, which helped build a flexible and dynamic system of lifelong learning and training, one that meets industry needs and also serves disadvantaged groups. Today the system, regulated under the Chilean Quality Assurance Standard, boasts a catalogue of some 1,000 competencies for 315 occupational profiles in 12 sectors of the economy, as defined by the relevant industry players. Since 2003, more than 29,000 workers have been certified according to these competency standards. The National System for Certification of Labor Competences was established in 2008, creating an institutional umbrella for the different types of education (academic, vocational, technical) and training modes (formal, informal, non-formal, pre-employment, enterprise-based). Through a second-chance program under Chile Califica, 145,000 individuals have been served, with 92,000 completing their basic or secondary education.



Step 4

Encouraging entrepreneurship and innovation

Problem: Traditional mindsets stifle creativity and risk-taking

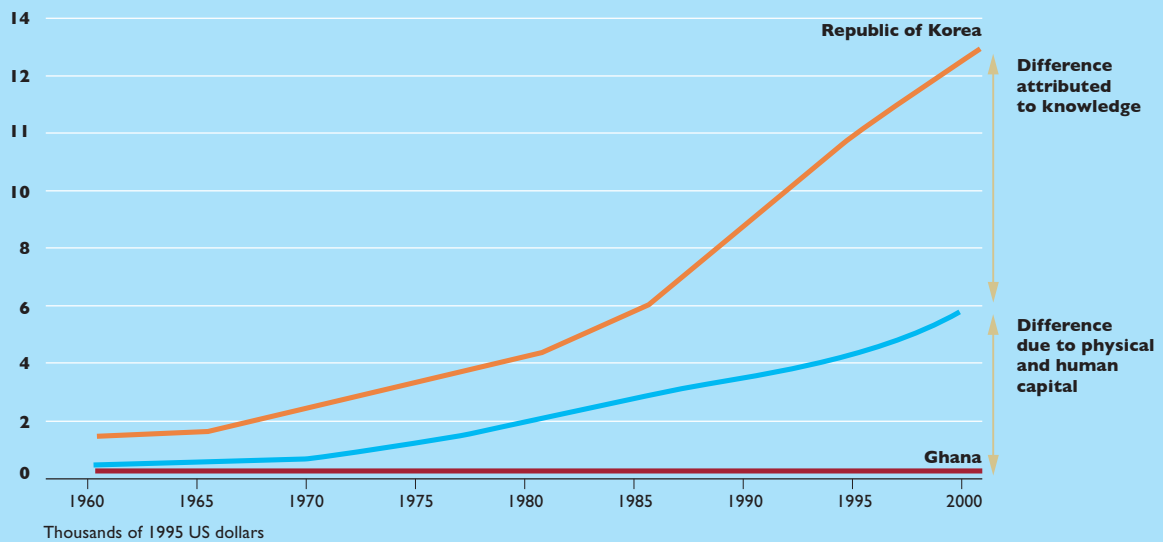
In 1955, Ghana and the Republic of Korea both had a GDP per capita near \$300. By 1990, Ghana's real GDP per capita was the same, but Korea's had increased to \$7,500. A third of Korea's growth can be attributed to the rapid increase in educational attainment and capital. The remaining two-thirds came from greater productivity in the stock of labor and capital and innovations in the uses and types of capital.⁴⁹

Chile's GNI per capita increased from \$590 to \$4,330 during 1960–2003. It had modest growth before 1990, largely due to physical capital and labor, but in 1990–2003, when knowledge and innovation started to boom, Chile's growth took off.

What did Korea do over those 40 years that Ghana did not do? And what caused Chile's boom in the 1990s? The Korean success is largely thanks to an aggressive, multi-pronged strategy comprising a rapid increase in primary and secondary education, public support to develop a research base through an emphasis on science and technology, and a knowledge-driven industrial policy.⁵⁰ In Chile, labor and capital played an equal role in 1960–73, but the jump in average educational attainment from 6 to 10 years was largely responsible for the growth in 1974–89. The rapid growth of the 1990s, by contrast, was due to knowledge and innovation spurred by even higher levels of education, a new generation with an “entrepreneurial spirit,” and competition between firms.⁵¹

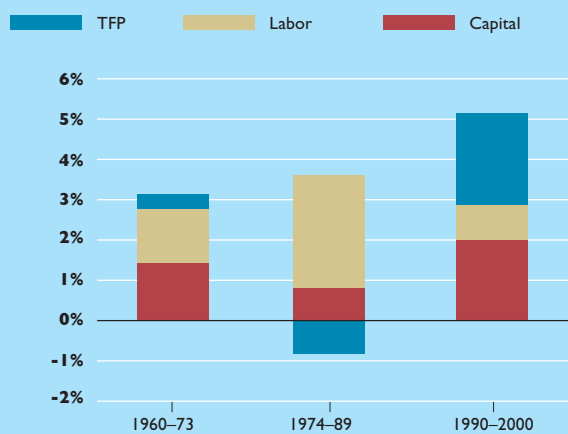
Knowledge produces growth. “Grey matter is a country's main resource,” and knowledge has become a key driver of competitiveness.⁵² And as the world

Figure 7. Knowledge makes the difference between poverty and wealth



Source: Adapted from World Bank. 1999. World Development Report. Washington, DC.

Figure 8. **Chile's recent growth rates came from higher education and innovation**



Source: Fuentes, Larrain, and Schmidt 2004.
Note: TFP is total factor productivity.

becomes more globalized, more reliant on technology, and more service oriented, a country's knowledge base will determine its growth path. Korea and Chile illustrate the need to simultaneously develop human capital, innovation systems, ICT infrastructure, and institutional regimes. This relationship between human development and private sector development is symbiotic, because one key aspect of innovation is not just developing new products and processes but also the ability of individuals to be entrepreneurial in bringing them to good use.

For countries to make the next big move—from developing the right skills demanded by the market to dynamically improving the quality and quantity of that demand—developing an innovation system is critical. The key role of “grey matter” in this points to the importance of steps 1–3 and the need to think about those processes in the context of developing knowledge for growth while implementing additional reforms to transform existing learning into growth-inducing innovations.

Innovation as an input to growth

Innovation is a process whereby people or groups of people with an entrepreneurial mindset (organizations, enterprises) develop new ideas or absorb and adapt

existing ones. Together with institutions and policies that affect their behavior and performance, they create new products, processes, and forms of organization. Innovation is not only about scientists in laboratories, theoretical science, or new discoveries. It is about building the capacity to find solutions to practical everyday development problems. So an innovative economy is marked both by Nobel Prize-winning scientists, and by small-scale entrepreneurs who develop ideas for new products or new ways of doing things and transform them into profitable products or activities.

Innovations can come in various forms. They encompass the products, processes, and services that meet market needs. They may be developed and marketed in the manufacturing sector, but they may also apply to new ways of doing things in all sectors, including commerce and service delivery. And the innovative idea needs to be widely tested and applied by those who have the skills and financing to bring it to scale. This calls for engaging those with marketing and managerial skills and venture capital.

Research is important—but not always central—to innovation, which may also be realized through less technical experimentation and discovery. The use of cell phones to provide banking services across India and Africa is an example both of developing cheap handsets and communication networks and adapting the technology to nontraditional use. At a macro level, Italy's rapid growth was almost solely due to process innovations and not to R&D, and Spain's rapid convergence to OECD average growth rates was almost solely due to adopting and adapting existing ideas.⁵³

Unlocking entrepreneurship and innovation

Innovation—and thus growth—can be encouraged by three human development–related factors, and the accompanying policies that facilitate them. First, individuals need a range of skills—those developed in steps 1, 2, and 3, but also other innovation-specific skills. Second, these skills and the ideas flowing from them have to be connected to others. Third, productivity increases when innovative small business owners can grow with the aid of risk management tools (step 4) or as innovative skilled workers enter the labor market (step 5).

Box 4. The face of an entrepreneur

A young Indian from a poor family leaves for his low-wage job daily, bids his mother farewell as she sits on the floor, crouched over the silk-yarn winding loom. The work is tedious and labor intensive. The young man has the idea to mechanize part of the weaving process, potentially increasing his mother's productivity and earnings. With earnings from his job, he begins to experiment with new loom designs, until he successfully develops a model that eases his mother's task. The partially modernized loom is adopted by other small-scale weavers.

A young man with a university degree in textile engineering travels to Rwanda to close a silk factory after the 1994 genocide. On arriving in Rwanda, he instead makes a deal with the factory owners to give him a chance to revive the factory. Drawing on his academic and business contacts, he resumes production, refines the quality of the silk, and begins designing his own products. Today the factory earns high profits in its export of fine silk products around the world.

Source: www.worldbank.org/education/sti; <http://saward.nif.org.in/awardprofile-all.php>

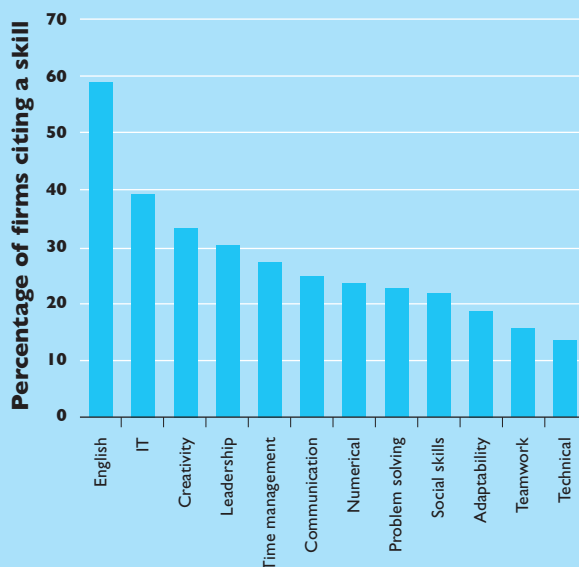
This three-part process is relevant to all individuals despite their starting points. A young Indian entrepreneur who improved on his mother's loom to increase her productivity and the older Indian Ph.D. in silk production who turned around a silk factory in Rwanda both benefit from general skills, creativity, entrepreneurial abilities, a connecting environment, and risk management tools (box 4).

Skills to be an inventor, an innovator, a creator

Three types of skills are necessary to unlock creative potential and take it to market.⁵⁴ First, the general skills in steps 1, 2, and 3 are necessary to adapt existing technologies, compete in an innovation-driven economy, and manage the increasingly networked innovation process. These skills include basic literacy and numeracy, problem-solving, and social and interpersonal skills.

Creativity produces new ideas. Innovative thinkers are curious and persevering and have “divergent thinking,”—imagining several responses to a single problem rather than converging to a single, right answer.⁵⁵ Surveys of employers or the self-employed in India, Malaysia, Thailand, and a range of other countries note that these innovation skills are sorely lacking today (figure 9).⁵⁶

Figure 9. Thailand: Top three skills that professionals lack the most in doing their job (manufacturing)



Source: World Bank Investment Climate Survey for Thailand.

Entrepreneurial skills range from managerial skills in running a business to motivation. These are the skills to sort out good ideas from bad ones, find the resources and means to create a prototype, and take the idea through its growth phases. Education and training systems can teach individuals to be cognitively developed, creative, and entrepreneurial—as illustrated by the owners of small firms in Ghana who, as a result of training in management techniques, saw their sales revenue grow and their gross profits equal the effects of 10 years of educational attainment.⁵⁷ These skills—attitudinal and behavioral, as well as pedagogical—are best learned through everyday practice to question, analyze, experiment, and interact with the world.⁵⁸

Both creativity and entrepreneurial skills can be incorporated into teaching methodologies at all points of the skill formation process. And education systems can encourage innovation-related specialties, such as math, science, and business and managerial skills. But these strategies will be successful only if education systems improve the quality of the basic math and science skills for

the majority of students. Without such a basis, efforts to instill risk-taking and entrepreneurial skills will be wasted.

In India, the government is implementing a program to increase the relevance of undergraduate education in science and technology by supporting the improvement of learning facilities and the development of relevant curricula as well as establishing reforms to promote academic excellence and school accreditation. Early results show that the project has improved the quality of education, and a second phase aims to scale-up several existing Masters and Ph.D. programs with concomitant research programs, both to develop the country's innovation base and to address faculty shortages that threaten to limit opportunities for tomorrow's students.

Connecting people and ideas

Innovation cannot realize its full potential if innovators are isolated. The innovator needs other creative and skilled individuals to share ideas with and bring those ideas to market, capital to finance the realization of the idea, and an enabling environment that accepts new ideas. People can be brought together through:

- *Migration policies that geographically concentrate innovative thinking.* In the fast-growing countries in East Asia, governments fund scholarships for math, science, and business students to earn degrees in external research programs and bring the knowledge home, while slower-growing Latin American countries invest less to connect their students to knowledge centers.⁵⁹
- *Innovation spaces.* In developing countries, innovation primarily occurs in public universities.⁶⁰ Across the world, governments fund competitive research grants to encourage universities to finance spaces for innovation (box 5). The successful Millennium Science Initiative in Chile established a Competitive Fund for Scientific Excellence, which financed Science Institutes and Nuclei. Similarly, the government of Nigeria is providing a small number of promising institutions with the resources to emerge as centers of excellence.
- *Publicly funded incentives for greater collaboration between universities and the private sector.* Chile provides

financial incentives for collaborative research between public education and private firms, facilitates internships for Ph.D. candidates in firms, and supports centers of excellence for thinkers and others who develop their ideas to work together. Such collaborative research can also occur without government interventions. In Beijing, nearly 25% of university research is co-sponsored by private partners.⁶¹ In Thailand, an agro-business conglomerate and a local university joined forces to develop DNA diagnostic probes to help reduce the shrimp crop losses through diseases. The marriage of the knowledge with the business led to the development of new shrimp DNA and to Thailand's capturing 30% of world shrimp exports.

Box 5. Enhancing public-private research cooperation

The Mexican government provided financial support and technical assistance to assist the formation of knowledge partnerships among private firms, universities, and research institutions. Public science and technology institutes sought to enhance client orientation in support of industry, while joint industry-academia projects were encouraged in applied research, product and process design, and technology adaptation and diffusion.

In Nigeria, grants of up to \$800,000 were awarded to partnerships between two or more science and technology education institutions and industry. In Uganda, private sector cooperation was strengthened by creating technology platforms for firms and researchers to define collaborative agendas for solving problems of direct interest to the industrial sector.

Public financing and policy support to a Malian university created a virtual knowledge network of universities and researchers, who joined forces to develop and test malaria vaccines.

Similarly, the government of Chile supported groups of researchers from universities, government laboratories, and private industry to undertake collaborative research in areas of importance to industry in various regions of the country. It also awarded scholarships to doctoral students who would undertake a substantial part of their thesis work in industry. The initiative is widely recognized for its contribution to a culture of innovation in private enterprises and to Chile's greater access to international knowledge networks.

Risk management tools

Innovation is risky. In developed countries only 5% of venture capital firms survive. And these are firms that cherry-pick the best ideas. New ideas need time and experimentation to develop, and if the idea fails, the individual has a negative return on his or her investment. So, in societies with few safety nets, innovation may be constrained.

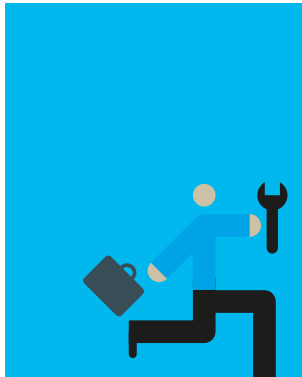
Policy can give a push to individual innovators by providing fall-back options. Risk management instruments, for example, can provide security to innovators so that they may expend resources on their new activities. An increase in the value of unemployment insurance in (credit-constrained) Brazil propelled the transition from unemployment to small-firm creation as opposed to wage-employment.⁶²

These instruments can vary, depending on the complexity of the innovation and the income of the

innovator. The poorest innovators need social safety nets to ensure that their families survive if the innovations fail. Since the greatest cost to these innovators is the time they spend on developing an innovation, general social safety nets insure against this income loss.

Those farther from the poverty line may need incentives to invest in innovation rather than more secure income-generation activities. Innovation funds that provide grants to individuals to develop creative ideas are becoming more common.

And for innovators across the poverty spectrum, policies that ensure a monopoly of returns from marketable innovations—patents, copyright laws—lower the income risk associated with developing non-rival ideas. While such legislation is outside the human development arena, its fair implementation and monitoring is crucial as individuals move through the process of implementing their ideas.



Step 5

Facilitating labor mobility and job matching

Problem: None of the first four steps matter if people can't find jobs that match their skills

Even if individuals have the “right” skills to be productive and creative, employment and productivity can be hampered if labor markets do not function well. Employers need the flexibility to manage their human resources. Workers need to move freely between jobs and regions. And employers have to find the skills they need, and workers the jobs that put their skills to best use.

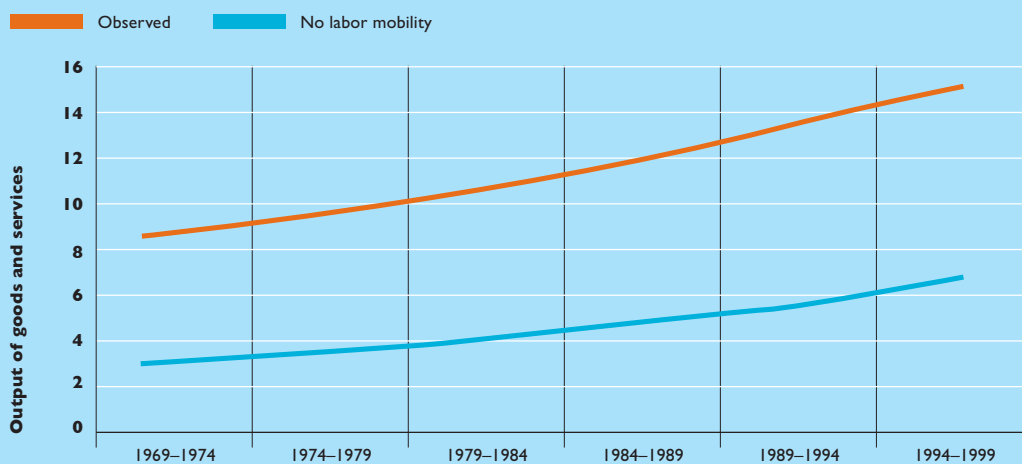
When workers cannot move freely, both output and productivity growth are reduced. Some calculations for the

United States for 1968–2000 show that without mobile labor, the output of goods and services would have been cut by more than half (figure 10). There is also growing evidence that lower turnover across firms is associated with lower productivity growth—firms facing high labor adjustment costs have fewer incentives to innovate and adopt new technologies.⁶³

Estimates of the costs associated with workers finding jobs that do not match their skills are more difficult to come by, but they are likely to be large. Again in the United States, the social value of information that allows workers to find the “right” job for their skills has been estimated to be between 6% and 9% of GDP.⁶⁴ In low and middle-income countries, the costs could be even higher because data suggest that personal networks are the most common mechanism to search for jobs or to hire workers.

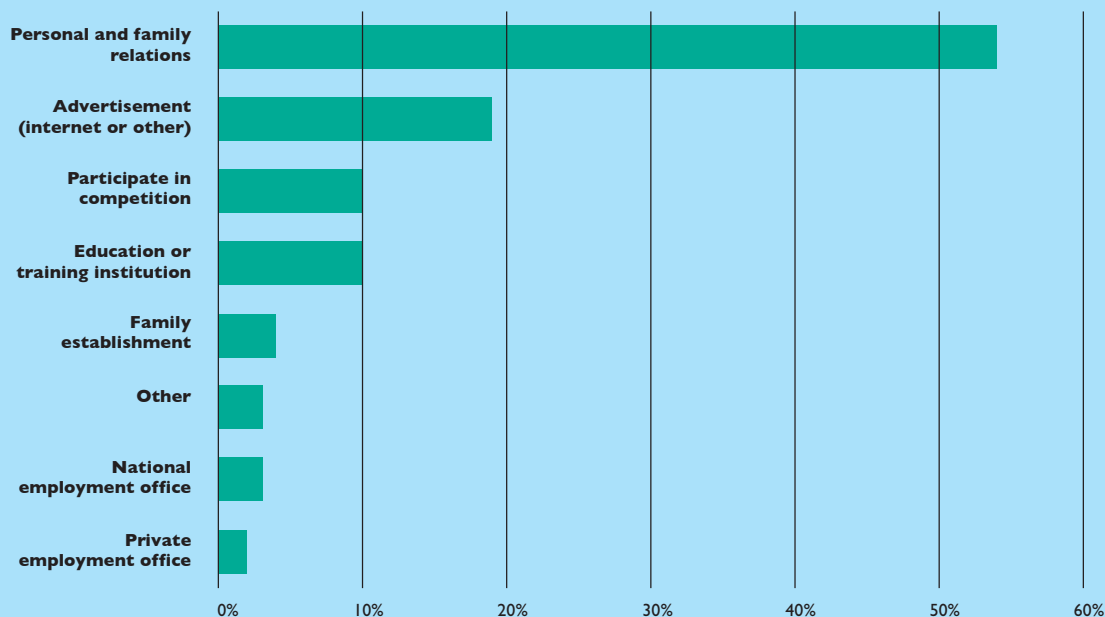
In Lebanon, 55% of young workers who found a job in 2009 used personal contacts; only 2% used employment services (figure 11). This is inefficient since individuals see only a small part of the jobs offered. While some might have the “right contacts,” those with weak social networks can be severely constrained in their choices. There is some evidence that job-skills mismatches are common.

Figure 10. **Without mobile workers, U.S. production of goods and services would have been cut by more than half**



Source: Based on Lee and Wolpin 2006.

Figure 11. **How workers (don't) find jobs in Lebanon**



Source: Kasparian 2009.

In Tunisia, more than 50% of university graduates are in jobs that do not use the skills they acquired in university (figure 12).

Youths entering the labor market for the first time, and thus lacking work experience and professional references, are likely to face more difficulties signaling their skills to potential employers. This problem can be amplified when there is no proper certification or accreditation for different training centers or universities. Indeed, there is some evidence that the transition to stable formal jobs involves a period where young workers alternate between short-term/low productivity jobs in the informal sector.⁶⁵ The problem is likely to be even more severe for informal sector workers lacking university or training diplomas.

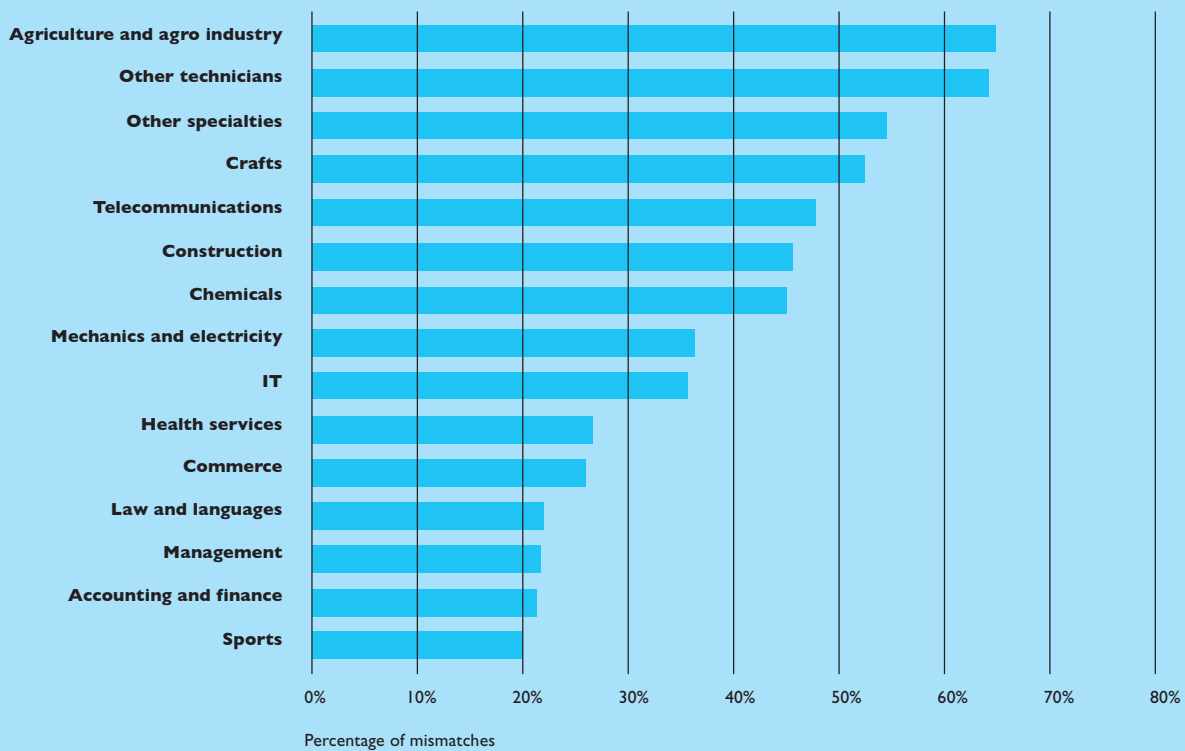
Governments can facilitate labor mobility and job searches through various interventions, including a better combination of job and income protection policies and more proactive approaches to employment services and skills certification.

Facilitating labor mobility

The combination of rigid job protection regulations and weak income protection systems can be detrimental to labor mobility. Evidence from Chile, Colombia, Brazil, and India shows that rigid regulations on hiring and dismissal procedures reduce turnover and employment.⁶⁶ At the same time, the lack of appropriate income protection systems in most developing countries, as well as the limited benefit portability of social insurance benefits, can also reduce the incentives for workers to transition between jobs.⁶⁷

Several countries are moving toward labor laws that give employers more flexibility in managing human resources, such as more flexible regulation of hiring and dismissal procedures. In many Latin American countries the termination of redundant workers is now legal, and few require the approval of a third party. Azerbaijan, Belarus, Kyrgyz Republic, FYR Macedonia, Mauritius, and Montenegro have eliminated requirements relating to redundancy over the last couple of years. Burkina Faso, Egypt, Lebanon, Mozambique, and Slovenia have also eased restrictions on fixed-term contracts.

Figure 12. **Mismatches are rampant for Tunisian university graduates employed in 2007**



Source: Robalino and others 2007.

And Argentina, Mauritius, Mozambique, and Peru have reduced dismissal costs.

The other side of the coin in efforts to enhance labor mobility involves expanding coverage of social protection systems to protect workers' incomes in the face of job loss. In many cases, innovations in income protection systems can provide an alternative to expensive severance pay systems—thus better protecting workers while facilitating mobility. For example, Colombia, Brazil, and Chile have introduced unemployment benefit systems based on savings. Relative to traditional unemployment insurance, these systems provide better incentives to search for and keep jobs and demand less control and administrative capacity.⁶⁸ They also have the potential to be extended to the informal sector. To protect low-income individuals with limited savings capacity some of these systems also provide access to a solidarity fund that finances unemployment

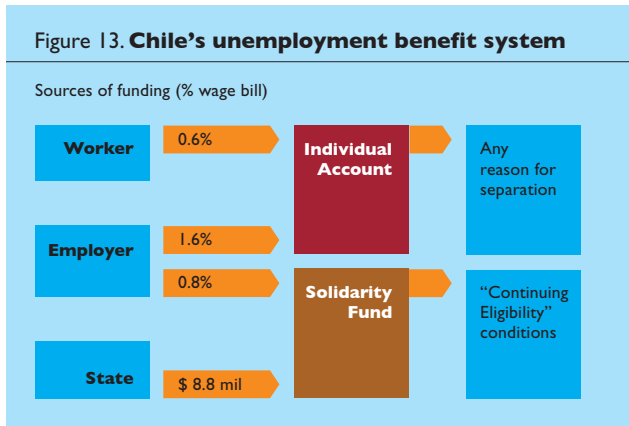
benefits after the individual's savings have been depleted. In Chile, such a solidarity fund is financed by employer and employee contributions and government transfers (figure 13).

Similarly, several countries in Latin America and Eastern Europe have rationalized defined-benefit pension systems, moving to defined-contribution arrangements (including nonfinancial defined-contribution systems) that make pension rights more portable and thus have the potential to enhance labor mobility and income security.

Improving the matching of skills and jobs

To address the problems of poor information and to make it easier for workers to find jobs that match their skills and qualifications (and for firms to identify workers with the relevant skills), both developed and developing countries often seek to establish employment services. By combining

Figure 13. **Chile's unemployment benefit system**



intermediation (such as providing lists of job vacancies and doing preliminary screening of eligible candidates or suitable jobs) and counseling (such as giving practical help to job-seekers preparing curriculum vitas, guiding workers' careers) the services can be a fairly low-cost mechanism to help individuals find better jobs.⁶⁹

In Brazil, for instance, employment services seem to increase workers' probability of finding formal jobs.⁷⁰ Similarly in Mexico, employment services are found to help unemployed men find jobs more quickly, with better pay and conditions.⁷¹ There are also some encouraging results about the effect of these programs on youth. An example is the U.K.'s Restart, which offers job search assistance for youth and reduces unemployment for male participants. This program, as well as most like it in OECD countries, includes such sanctions as denying welfare benefits for not complying with program rules. Overall, employment services seem to work better when linked to unemployment benefits, training, and competency assessment programs in "one-stop shops."

In fact, employment services are being revamped in several middle-income countries. International experience⁷² shows what's important for the successful design of these programs:

- Providing incentives for job-seekers and employers to join.
- Integrating employment services with training and competency assessment programs.
- Decentralizing management and expanding the role of the private sector with clear targets.
- Exploiting information technologies.

An important incentive for workers is to provide unemployment benefits. And to attract employers employment agencies can offer such services as managing vacancies and helping to screen candidates. In the United States, the JobsLink program in Alexandria, Virginia, has shown that it can outperform big employers in finding candidates with a given set of skills. It does this by having systems that assess job-seeker qualifications and their suitability for various jobs. Having access to training programs (outsourced to private providers) also helps unskilled workers and those changing sectors or occupations.

Decentralized management allows regional and local offices to tailor programs to the local job-seeking and employer communities, while the central administration retains responsibility for budgeting and funding, setting policy, and evaluations. In many cases, services can be outsourced to private employment agencies.⁷³ In all cases, it is important that contracts (with public or private offices) include specific placement targets and incentives to achieve them.

Recent advances in information technology can substantially reduce the costs of job intermediation, enabling employment ministries in Argentina, Brazil, Bolivia, Chile, Colombia, Mexico, Peru, Uruguay, and Venezuela to make information more readily available to job-seekers and employers. This information covers a wide range of topics including workers' rights, employment regulations, training programs, vacancies at home or overseas, as well as information targeted to vulnerable groups (young people, women, disabled workers).

Among high-income countries, Korea's employment services integrate job-search assistance with unemployment benefits, training, and job creation.⁷⁴ Implemented in 1995, they cover all companies regardless of their size, and both part-time and hourly workers can participate. The Bureau of Employment Policy in the Ministry of Labor makes policy and regulates the system, and hundreds of public and private local centers implement it. The system costs around 0.36% of GDP and in normal times has displayed a fairly high placement rate. At a one-stop shop job-seekers approaching any of the local offices have access to a variety of services. Beyond access to information about jobs and job counseling, the system provides employment

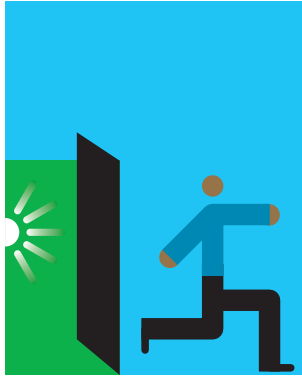
promotion benefits. On top of unemployment benefits, these provide incentives for job-search or training—when jobs are found, individuals can keep the balance. There are also grants to facilitate job-search in distant areas and a mobility premium if workers find jobs that require moving or changing residence.

In middle-income countries, an example of a well-run employment service program is Peru's Red CIL Pro Empleo. Created in 1996 and managed by the Ministry of Labor and Employment Promotion, it operates through a network of labor information centers managed by the private sector—including NGOs and churches. And it provides advisory services to job-seekers as well as employers. Job-seekers receive information about job openings but can also request advisory services (counseling) for career choices and support in preparing CVs and getting ready for interviews. If appropriate, job-seekers can also be referred to alternative training programs to improve their employability. Employers get access to a database of job-seekers and receive services including the prescreening of potential candidates

and support with official administrative procedures related to preparing and registering labor contracts.

One special feature of Pro Empleo is its focus on vulnerable low-income youth, low-skilled workers, and the disabled. The cost of the program is estimated at 0.4% of GDP. Although it has not been subject to formal evaluations, implementation reports suggest that Pro Empleo is achieving most of its targets.⁷⁵ In 2006, its placement rate was estimated at 28% of job-seekers, or 68% of the demands placed by employers.

Job-search can also be facilitated through skills certification frameworks to recognize individual skills and competencies (see step 3). While the impact of these programs has not been evaluated, they have the potential to fulfill a valuable role, particularly as modes and pathways to developing skills and competencies become more diverse.⁷⁶ Skills certification often needs to be complemented by efforts to certify or rate universities and training centers to provide better information to employers about the value of different diplomas and specializations.



Implementing the STEP framework

STEP is not a blueprint for reform or a fixed set of recommendations for countries to follow. It is a framework that can help countries work through the challenges in building skills for growth and productivity and find the solutions that work in their own environments. It is also a call for a comprehensive approach that resists the temptation of seeking single-minded solutions in the expectation that they will address the skill development gaps.

Implementing the STEP framework involves three key phases:

- *Benchmarking and analytical diagnostics*—to identify the main gaps across the various steps, including the use of analytical instruments to measure the distribution of skills in the labor force and identify structural mismatches. These results need to be benchmarked against other countries to locate both the present situation and aspirations, accompanied by institutional analysis that explains the observed patterns. Important progress has been made in recent years in developing of measurement instruments in several of the key dimensions of the STEP framework—from early childhood development to a variety of skills among working adults—to facilitate the application of diagnostic exercises in developing countries. But further efforts are necessary to develop these instruments and the capacity to implement them systematically.
- *Policy analysis and program design*—to respond to each country's existing systems and to the constraints in institutional capacity and fiscal space. Program design can be informed by other country experiences, adapted to local conditions. Growing evidence from a range of evaluations provides a platform to learn and identify

approaches appropriate to local conditions. But finding the right approach is often a learning process of refining and adapting policies and building strong monitoring and evaluation modules.

- *Coordination and priority setting*—to allow for the phased implementation across sectors. Most policies implicit in the STEP framework require actions by several public agencies. In many cases active involvement of nonstate actors (for and not for profit) is also essential. Moreover, given limited resources, choices often have to be made about allocating resources to reforms that have a short-term payoff or those that invest in the future (active labor market programs for today's unemployed and early childhood development programs for tomorrow's workers). Both factors emphasize establishing institutional mechanisms for leadership at a senior policy level, with the interconnections among policies coordinated and shepherded by multisector steering committees, including nonstate participation.

Each country's approach will depend on the context, but for all countries the starting point is benchmarking—to see where it stands on each of the steps in relation to other countries. That will reveal the steps in most need of attention. Next is conducting policy analysis and designing programs. That will take into account the available capacities and resources. Then the policies and programs are gradually implemented in phases, with careful attention to sequencing and cross-sectoral coordination. That will point to steps offering the greatest returns, working toward building all five steps in the system.

The STEP framework provides a reminder that the challenge of building effective skills for employment and productivity is multifaceted. Efforts to enhance the supply of skills at various levels must recognize these key elements of this framework.

- *Behavioral skills*—teamwork, diligence, creativity and entrepreneurship are essential
- *Path dependence*—early investments make later efforts more productive
- *Labor market clearing*—just having the right skills may not be enough, and labor markets must make it possible to find and use those skills.

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Skills are at the core of improving individuals' employment outcomes and increasing countries' productivity and growth. This is particularly relevant as today's developing and emerging countries seek higher sustained growth rates. Most of them face serious demographic challenges—from a “youth bulge” of new job-seekers in Africa and the Middle East, to a demographic transition of shrinking labor forces in Eastern Europe and Central and East Asia.

As countries become richer and move up the value-added chain, the skills demanded will change. Bottlenecks will become more evident, constraining growth. Increasingly, labor productivity will depend on high-level cognitive skills (such as analysis, problem solving, and communication) and behavioral skills (such as discipline and work effort). These higher productivity skills are what employers now demand.

A simple conceptual framework—Skills Toward Employment and Productivity (STEP)—can help policymakers, analysts, and researchers think through the design of systems to impart skills that enhance productivity and growth. Pulling together what is known about the elements of a successful skills development strategy, it can guide the preparation of diagnostic work on skills, and subsequently the design of policies across sectors to create productive employment and promote economic growth.



Step 5 Facilitating labor mobility and job matching

Step 4 Encouraging entrepreneurship and innovation

Step 3 Building job-relevant skills

Step 2 Ensuring that all students learn

Step 1 Getting children off to the right start