

Skills or jobs: Which comes first?

Jobs require skills, but they also build skills and create a demand for them

Keywords: skill formation, skill mismatch, knowledge spillovers

ELEVATOR PITCH

Skills are widely regarded as being necessary for boosting productivity, stimulating innovation, and creating new jobs, while skill mismatches are often cited as being responsible for a lack of dynamism in the labor market. However, heavy investments in technical and vocational training programs are seldom a “silver bullet.” Recent evidence on skill building not only points to the core importance of foundational skills (both cognitive and social) for success in the labor market, but also emphasizes how jobs themselves can lead to learning and shape social competencies that, in turn, ignite innovation and create more jobs.

KEY FINDINGS

Pros

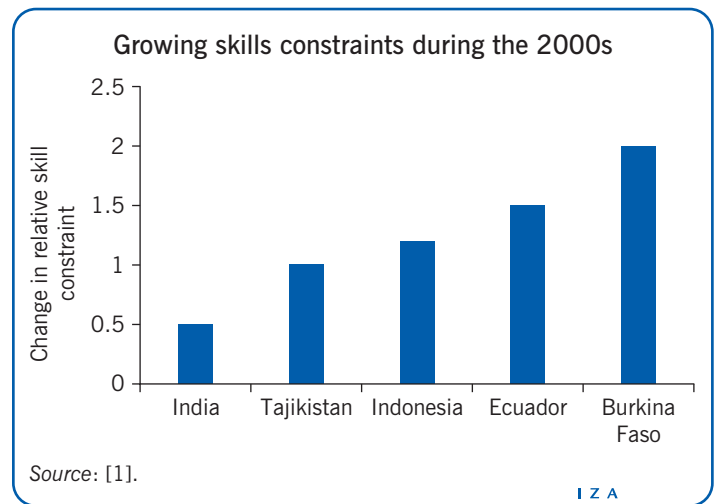
- ⊕ Basic cognitive and social skills are necessary for productive employment, and often acquired early in life.
- ⊕ Many technical and social skills can be built and developed through experience in the workplace and lead to sizable returns, especially during formative years in the labor market.
- ⊕ Pre-employment and on-the-job training can carry positive returns if they address market failures in the education and training system, are closely combined with work experience, and governed by a flexible and modern institutional structure.
- ⊕ More advanced skills can boost job creation by igniting innovation when countries are caught in traps of low skills and low productivity.

Cons

- ⊖ Pre-employment and on-the-job training alone are unlikely to solve a lack of dynamism in the jobs market.
- ⊖ Skill mismatches are most often assumed to originate on the supply side, with education and training systems being tasked to reduce the misfit; but this assumption need not be correct, as the incentives the system reacts to can be the source of the mismatch.
- ⊖ Even when skill mismatches are supply-side driven, the technical and vocational training systems in many countries lead to low returns, distance from private sector demand, and inequitable access.
- ⊖ Schools and training centers rarely include the formation of social skills as an explicit goal.

AUTHOR’S MAIN MESSAGE

Foundational skills, both cognitive and social, are essential for productive employment, and these require investment in early learning and education systems. They are also necessary for the development of more specialized skills, particularly for countries seeking to move up the “value-added” ladder of production. Such highly specialized skills can stimulate innovation, enhance learning and, in turn, create more jobs. However, providing technical and vocational training is not always the answer. Work experience in itself can encourage learning and help shape skills, especially for young people.



MOTIVATION

A commonly held view is that skills lead to job creation, higher productivity, and increased national income. As a result, shortcomings in the vocational and training systems are often considered to be the underlying cause of an economy that lacks dynamism, which in turn can trigger countries to massively invest in skill building. However, a number of rigorous impact and evaluation studies have shown mixed results for vocational and technical training and, rather, point to the core importance of foundational cognitive and social skills for ensuring productive employment. Similarly, the relationship between skills and jobs can also work the other way: i.e. when the availability of jobs and demand for specific competencies encourages the take-up of skill building and education. The literature also highlights circumstances under which jobs themselves directly build skills, technical as well as, importantly, social ones. Thus, depending on the causal relationship between skills and jobs, public policies to foster productive employment would differ. Can the relationship between skills and jobs be disentangled?

DISCUSSION OF PROS AND CONS

Skills formation and measurement

Skills are acquired throughout life. People learn, adapt, and form their skills through a multitude of interactions and mechanisms, within the household and neighborhood, during the formative years of schooling, at work, and during training. Cognitive skills include verbal ability, working memory, numeracy, and problem-solving abilities. Social skills are based on personality traits that underlie behaviors such as teamwork, reliability, discipline, or work effort. Technical skills enable the performance of specific tasks. Because all jobs require a combination of skills that are formed in multiple ways and in diverse circumstances, policymakers face complex challenges in forging the best path for skills development.

The first months and years in life are the most crucial for skill formation. This is when intelligence and learning abilities, the foundations for the development of core cognitive and social skills, are cemented [2]. Brain maturation occurs in steps, with new skills building on earlier ones. If the foundation is strong, higher-order cognitive and social skills can be added later on. This leads to higher adaptability in a rapidly changing job environment and the acquisition of job-specific techniques. While foundations are laid early on, skills are also further shaped after childhood and in working life.

Attention to the measurement of skills has gained prominence worldwide. Achievement tests provide information for parents, instructors, and administrators, and enable a better understanding of system-wide performance and achievements. One such example is the Program for International Student Assessment (PISA), coordinated by the OECD, which is geared to evaluate education systems by testing the skills and knowledge of 15-year-olds. Recent research has shown that what is measured in such tests goes beyond the assessment of technical or cognitive skills: a good part of the variation in achievement tests can be attributed to personality traits or non-cognitive skills, as well as incentive systems, i.e. rewards being linked to the outcome of the testing. A growing body of literature now focuses more specifically on measuring these non-cognitive skills, often decomposing the assessment into the different personality traits. Results show that non-cognitive skills are critical in predicting individuals' life outcomes, including educational attainment and earnings.

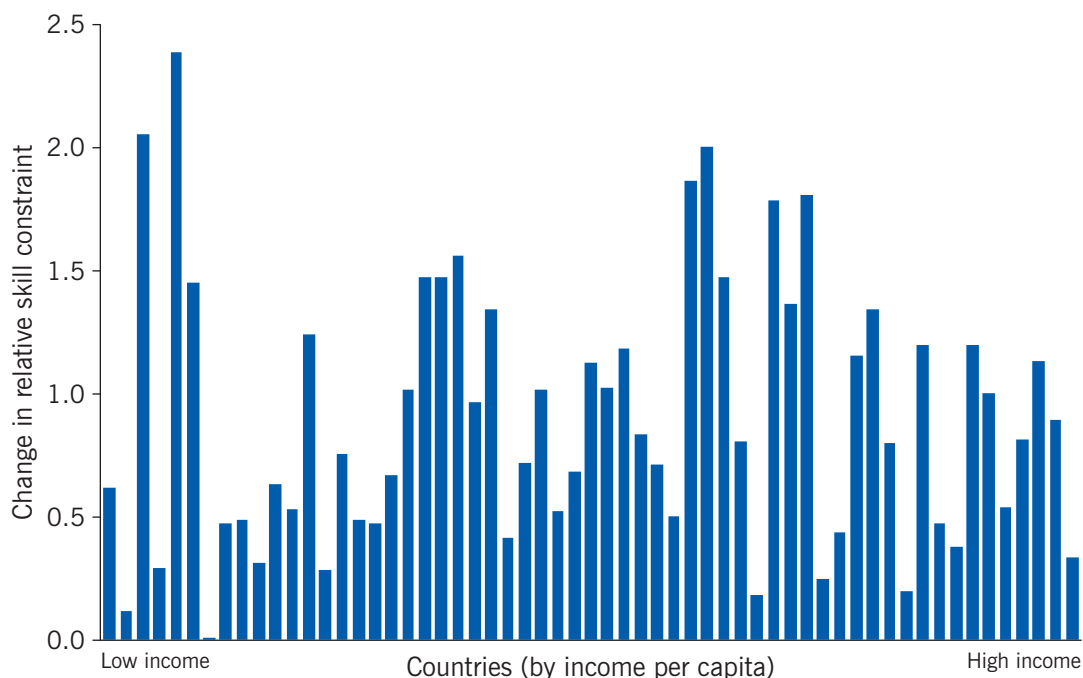
The link between skills and economic growth

Since human capital theory established a clear link between skills and economic performance, it is generally held that education and training are wise investments for individuals to be able to increase their employment chances and earnings, as well as being necessary ingredients for economic growth and job creation. The risk of living in poverty declines with the acquisition of basic cognitive skills in numeracy and literacy. In fact, the link between such skills and productivity growth has been shown to be stronger than that with school attendance rates. In addition, the possession of these skills is particularly important for countries undergoing structural transformation, as they are often the precondition for creating employment opportunities outside of agriculture, in services or industry.

Globally, however, it appears that the workforce does not possess the skills required by the economy, and skills mismatches are arguably growing rather than shrinking. In many countries (e.g. Brazil, Costa Rica, Pakistan, Sri Lanka, and Tanzania), up to one-third of those employed are either under- or over-qualified for the work they do [1]. Moreover, skill constraints in the formal sector around the world are considered by managers to be more acute now than in the first half of the 2000s (Figure 1)—although some evidence shows that this result holds less so for farmers and entrepreneurs of unregistered firms in the informal sector [1].

To address these mismatches, private firms or individuals could choose to upgrade their skills through further education or training. But this seldom happens, for several reasons.

Figure 1. Relative to other obstacles, skills were a growing constraint during the 2000s



Note: The relative skill constraint is defined as the ratio between formal firm managers' rating of skills as a major or severe obstacle to their operations, and the average of all other constraints firm managers are rating as a major or severe obstacle. This allows for a comparability of skill constraints across countries and over time. A positive value implies that skills have, relatively speaking, become more of a constraint than other variables.

Source: World Bank. *World Development Report 2013: Jobs*. Washington, DC: World Bank, 2012 [1].

First, smaller firms, farms, and individuals can rarely afford to pay for this, and borrowing is often not an option. Second, firms that can afford to train their workers are not keen to do so because they are afraid that, following the training, other firms will “poach” the workers. Finally, neither the firms nor the workers might possess the information needed to identify the skills gaps. Pertinent information in this respect would include job market and earning prospects for specific careers and competencies, as well as the quality and success rate of different skill-building providers (including technical schools, universities, and on-the-job training) [3].

In view of such market failures, education and training systems are often tasked with dealing with high unemployment and low productivity growth. Consequently, many countries are stressing vocational education and on-the-job training as a means of equipping the workforce with the required skills. For example, in 2014, Turkey’s Public Employment Agency delivered more than 370,000 vocational, entrepreneurship, and on-the-job training courses for the unemployed and employed alike, representing more than a tenfold increase over 2007. Similarly, the goal of India’s National Skills Mission is to train 500 million people by 2022.

The pitfalls of skill building

Although the importance of skills cannot be over-estimated, care needs to be taken before any decisions are made regarding the development and implementation of extensive programs to build skills. A first important step is for policy to address market failures that can lead to the under-provision of education and skills: addressing possible credit constraints for firms, education and training institutes, and students, through different instruments, such as (i) guarantees and student/training loans; (ii) reducing poaching externalities through different contract structures (in which skill building is linked to a longer work commitment); or (iii) closing information gaps through investing in outreach campaigns that provide job and earnings information of different career and skill-building choices [3].

Often, the root cause of skill shortages, or mismatches, has little to do with the education and training system. It may instead lie in market distortions and institutional failures, which lead to wrong signals being sent to hiring firms and skill-building institutions, as well as to individual job-seekers. When the salary for a career in the civil service is particularly high, young people may study to obtain such jobs, even if they need to queue for them. This can lead to the acquisition of specific skills that are irrelevant for the private sector, and to unrealistic expectations. Here, ensuring the efficiency of the civil service in terms of both size and rewards—in line with comparable private sector salaries—would adjust the signals for young people when making educational decisions. Similarly, regulations or other institutions may compress skill differentials, thereby reducing incentives to invest more in education and training [4]. Alternatively, firms may be unable to find the “right” skilled workers for offered jobs because of transportation problems or housing market issues. Geographical integration policies, or ensuring a functioning housing and rental market, could then have a positive effect on reducing apparent skill mismatches. In all of these cases it would seem, at first glance, that the constraints can be attributed to skills, but a closer examination shows that they are not actually related to the education and training system.

How can skills be successfully built across the board? The answer is not straightforward, as evidenced by pre-employment and on-the-job training in the developing world. On-the-job training is closely linked to higher earnings and productivity [3]. Yet only a fraction of workers benefit, as training is rarely given to the less-educated workers and those in smaller and informal enterprises. Moreover, technical and vocational education (TVE) does not guarantee the successful acquisition of needed skills and, in rural areas, its reach is frequently very limited. In fact, TVE has led to increasing socio-economic inequalities in some countries, rather than promoting social mobility. Often, inequitable access to TVE and the low quality of programs are major constraints [3].

Efforts to build skills are often hampered more by institutional weaknesses than by market failures, with issues pertaining to accountability and governance being particularly problematic. Nonetheless, there are both positive and negative aspects. On the positive side, traditional manpower planning has been replaced by modern and flexible skills-development strategies. This allows skill-building curricula and competencies to adjust quickly to private sector demands, which is especially important in times and sectors of rapid technological advance. Another development is the creation of oversight entities in a number of countries, such as the Pakistan Sindh Technical and Vocational Training Authority. These entities are responsible for quality control and management of providers, which can be carried out separately from financing. Similarly, in India, the National Skills Development Strategy is based on the principle that training, certification, and accreditation institutions should be clearly separated. On the negative side, throughout the world, training programs and pre-employment education remain adversely affected by the dispersion of responsibilities across multiple ministries, the lack of private sector involvement, the slow response to rapidly changing skill needs, and capture by providers.

The curriculum in educational institutions is also important. Although it is recognized that employees frequently lack non-cognitive skills, these skills are not normally included in the curriculum, and thus are not acquired in schools or training centers [3]. In Peru, for example, 40% of employers believe that their employees do not have dependable work ethics and personal qualities, such as teamwork, persistency, ability to reach consensus, and initiative [5]. While these findings may be subjective, they are supported by more conclusive evidence indicating that returns to the socio-emotional trait of perseverance are as high as returns to average cognitive ability [5].

Learning through jobs

While it is recognized that skills are required for jobs, it is also true that jobs enable the development of skills. Work experience can build both technical and social skills, and shaping skills “on the job” carries sizable returns. Across countries, the return to work experience in non-agricultural activities is, on average, about half of the educational return at the beginning of an individual’s working life [1].

Although there are different types of apprenticeship programs, they all use job experience to integrate education and learning. The most developed is the “dual model,” which is of Central European origin. This combines class-based learning that focuses on developing general skills that can be used in any job, with learning that is acquired on the job and through actual work experience within the training company. In France, Germany, and the Netherlands, the dual system is credited with fast and structured employment integration

following completion of the apprenticeship program. The dual system requires more than the right economic incentives, as it is based on a social contract between employers (to offer places and invest in the future career of apprentices as a common good), trade unions (to accept below minimum-wage payment for trainees), and government (to fund vocational schools and ensure quality control) [4]. For apprenticeship programs to work it is essential that private sector firms remain committed to the programs by continuing to finance them even when the economy is in decline.

A number of developing countries embarked on replicating the dual model for individual sectors, or on broader scales, including Benin, Cameroon, Egypt, Mali, and the Philippines. Efforts have not always been successful because the institutional requirements are high, including: (i) support from employers to provide on-the-job training to support longer-term job prospects in productive jobs; (ii) young people and trade unions to view apprenticeships with lower earnings as a form of skill acquisition; and (iii) the vocational training system itself to supply job-relevant training in close cooperation with government, employers, and trade unions within a clear regulatory framework that includes permanent adaptation to improve the relevance of the learning material and methods [4]. Apprenticeship programs can also be more informal and facilitate the passing of technical skills from one generation to the next, as is the case in many African countries today. Such informal models can become the basis for a stepwise integration into national training systems.

The end of formal schooling does not necessarily signify the end of skill development. In fact, individuals continue to develop skills right through to the end of their working lives. Research has shown that jobs themselves shape social attitude and skills, especially at a young age [6]. Thus, a positive job experience can have an impact on developing attitudes and behavior, which can support the development of socially cohesive societies. In one evaluation conducted in the Dominican Republic, a combination of life-skill training, vocational training, and internships for youths from vulnerable backgrounds (16 to 29-year-olds who had not completed secondary school) had a number of significant effects: a decrease in violence, gang membership, drug use, and unprotected sex. The young beneficiaries also reported feeling higher self-esteem due to the program interventions [7].

Jobs can also facilitate the transmission and sharing of knowledge, as workers are constantly interacting on a daily basis. Similarly, knowledge spillovers underlie the agglomeration effect of business clusters in cities and areas of high population density. Across 1,500 sub-national regions in 110 countries, education is considered to be the main determinant of knowledge spillovers and entrepreneurship [8]. However, knowledge spillover from jobs is not limited to cities; farmers with experienced neighbors can become more productive, and social learning in villages can be particularly beneficial [9].

Furthermore, jobs can stimulate skill building by putting employees in contact with a wider external environment and set of influences. Through working in foreign-owned or international companies, employees can gain new technical and managerial skills. For example, in 1972, India's Tata group became the first international company to partner with Singapore's Economic Development Board to establish a company-owned training center for precision engineers. Other non-Singaporean companies then followed the same approach, and, in 1993, the various institutions were consolidated to form the Nanyang Polytechnic. Today, the Nanyang Polytechnic has become a source of international expertise on industry-led training [3].

Jobs can both “pull” and “build” skills

In order to be productive in the workplace, it is necessary for an individual to already possess certain basic skills that have not been acquired on the job. For example, without basic numeracy and literacy skills, the prospects of improving employment opportunities and earnings, whether in agricultural or in urban settings, are limited. In addition, social skills are becoming increasingly important as complements to basic cognitive skills and, since skill building is cumulative, it is essential that a solid foundation is established in order to facilitate the subsequent acquisition of further skills. Once this foundation is in place, jobs can “pull,” or attract, skills. The demand for education increases in line with growth in employment opportunities, and this has to be met by education and training systems. However, it is important that policy transmits the appropriate signals, in order to adequately incentivize both students and workers to continue to acquire skills. One such transmission is communication and information: when students in the Dominican Republic were provided with information about the actual returns to secondary school education, school attendance increased [10]. Similarly, in India, reaching out to rural women with information about job opportunities induced both the uptake of schooling for girls and later marriage and childbearing for women [11]. The second transmission relates to these signals, including pay and benefits, being transmitted correctly and not being distorted. Such distortion occurs, for example, when access to jobs is unequal or discriminatory. Then, pay, benefits, and working conditions might be artificially high or low, which hinders appropriate skill building.

Jobs can also “build skills,” especially when job-seekers first enter the labor market. When the transition from school to work is problematic, the negative effects on young people can be long-lasting. For this reason, policymakers in many countries are placing particular emphasis on enabling a positive school to work transition so that young people can benefit from learning in their first job.

However, even when the basic cognitive skills have already been acquired, jobs may not necessarily pull or build skills. This occurs when the benefits from agglomeration and global integration are present but cannot be materialized because the necessary specialized skills that ignite innovative processes are missing. Countries undergoing rapid urbanization often have sizable knowledge spillovers to exploit which are, in part, realized when companies adopt new technologies, move into the production of new products and up the value-added ladder. However, for this process to occur, a stock of skills is necessary to promote technological progress—and if this stock is not present, countries can get trapped in an environment of low productivity and low skills [12]. This tends to arise when skills are inadequate to promote innovation and the demand for skills is too low to encourage their acquisition. It points to the need for improvements across the education spectrum—from schools to higher education—with a particular focus on the relevance of the skills that are being built.

LIMITATIONS AND GAPS

Multi-dimensional skill measurement, i.e. capturing both cognitive as well as social skills, in both OECD countries and the developing world, has started only recently, and the evidence base about social skill formation in particular is still thin. Similarly, more empirical case studies are required to better understand how social, cognitive, and technical skills are formed and interact, and how, both individually and jointly, they influence job success—productive, gainful employment as well as income progression. Further, with the documented success of the “dual learning” system, i.e. combining work experience

with job-relevant skill acquisition in vocational schools, a deeper understanding of how the significant institutional requirements can be adopted to lower capacity environments in developing countries would be important. Finally, knowledge spillovers between jobs have been measured at a macro and industry level, but little is known about the firm and business environment that is conducive to this virtuous productivity effect.

SUMMARY AND POLICY ADVICE

A number of key messages arise for policymakers with respect to skills and jobs. First, basic skills—both cognitive and social—are a prerequisite of productive employment and cannot be acquired solely by workers on the job. Without such skills, the prospects of improving employment opportunities and earnings are thin. Moreover, if countries are to move up the value-added ladder, the workforce must have foundational cognitive and social skills in order to set innovation in motion, promote mutual learning, and thus create jobs.

Second, with the increasingly rapid changes in the nature of jobs, social skills become more and more important and need to be built into the educational, training, and apprenticeship frameworks of countries in a rigorous way. Returns, in terms of employment trajectories, to developing social skills, such as flexibility, ability to work in teams, reliability, the ability to assume responsibilities, and also perseverance, are high and likely to rise.

Third, policies and programs that combine on-the-job learning and training during the crucial years of the school-to-work transition hold the potential to have high economic and social returns. Institutional demands for such dual learning are high and require a broad coalition of employers, unions, young people, and the government alike.

Fourth, the first job experience of young people transitioning from school into work is formative—both because skills are acquired on the job and because this first experience influences self-esteem and is a signal for future employers.

Finally, technical and vocational training programs need to be designed with care so as to avoid high costs, mediocre quality, and limited reach. They also cannot be looked at as a silver bullet to solve productivity and unemployment challenges since the underlying causes of unsatisfactory employment outcomes can arise outside of the skill-building system.

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Competing interests

The IZA World of Labor project is committed to the *IZA Guiding Principles of Research Integrity*. The author declares to have observed these principles.

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Further reading

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