Econometric analysis using data from World Bank Enterprise Surveys finds significantly higher employment growth (2–4.5%) in firms that offer training or use technology and innovation. Firms less likely to use these tools are smaller and in low-income countries. Even though small and medium-size enterprises (SMEs) perceive workforce education and skills as a bigger constraint for their operations relative to large enterprises, they are less likely to offer training or under-invest in it.

Two main literature threads address this issue. One focuses on how training affects economic development (Schultz 1964; Jamison and Lau 1982). The other centers on studying innovation and absorptive capacity including technology transfer and innovation in managerial and production skills that might contribute to higher productivity and efficiency (Smeets 2008; Dutz and others 2011). For instance, Dutz and others find that employment growth rates were higher for innovating firms. In addition, firms exposed to information technology and networks (through the Internet, business associations, and export production) generally innovate more and have larger employment growth.

All these studies call for policies that support innovation, including encouraging skill transfer, capacity development, and knowledge access. Yet little effort has been made to examine this issue using cross-country micro-level data. This note sheds light on this issue, using Enterprise Surveys conducted between 2006 and 2010.

Education, skills, and training

Enterprise Surveys do not collect specific information on the education or skill levels of firms’ workers. Instead, two related pieces of information are used: firms’ concerns about the lack of adequate education and skills among their workers; and whether firms offer training to their employees.
The surveys asked firms about the biggest obstacle in their operations. There are 15 main concerns in the surveys, and firms were asked to select their biggest obstacle. About 10 percent of SMEs chose having an inadequately educated workforce as their biggest obstacle (Figure 1). This burden is present in a variety of sectors, but is perceived as the main constraint by fewer firms in textile and chemical sectors.

From a regional perspective, a larger share of firms in Europe and Central Asia (ECA), followed by Latin America and the Caribbean (LAC), perceive an inadequately educated workforce as the most important constraint. The largest differential occurs by country income group: almost 14% of firms in high-income countries consider an inadequately educated workforce as the most binding constraint, compared with 2% in low-income economies. There are two likely reasons. First, in lower-income groups, other constraints (such as access to finance or infrastructure) are considered more pressing. Second, firms in higher country income groups are focused more on high value added production, which requires upper education and skills.

Training provided by enterprises varies by size, sector, region, and country income:

- **Size.** Almost 40% of firms surveyed said that they offer training to their workers, but the variation by firm size is substantial (Figure 2). About 30% of small enterprises offer training. In contrast, about 50% of medium-size enterprises offer it, and for large enterprises it is as high as 70%.  

- **Sector.** Only 20% of firms in the textile industry offer training, while more than 50% of firms in the chemical, metal, and services industries do.

- **Region.** More than half of firms in LAC provide training to their workers, a higher percentage than in any other region. In contrast, a lower percentage of firms offer training in EAP.

- **Income.** A smaller percentage of firms in low- and lower-middle-income countries offer training relative to other income groups. Firms in upper-middle and high-income economies have about the same percentages in offering training.
Technology and innovation

Enterprise Surveys provide users with rich information on firms’ adoption of recent technology and innovation programs. The analysis tabulates three indicators: whether a firm has received an internationally known quality certificate, uses email for production and operations, and has a website for production and operations.

The use of technology and innovation varies a lot by firm size. Smaller firms lag behind in technology and innovation adoption in all three areas (Figure 3).

The breakdown of the technology and innovation indicators suggests a positive relationship between income group and percentage of firms adopting technology and innovation (Figure 4). Firms in upper-middle and high-income countries tend to adopt more new technology and innovation for their operations than do firms in low-income countries.

Econometric analysis was conducted to examine if skills enhancement and adoption of technology and innovation affect employment. Regression results of gains on annual employment growth from the three technology and innovation indicators are broadly presented in Figure 5. Each indicator was added to a regression model that controlled for firm characteristics such as size, age, production capacity, export activity, ownership type, as well as city size, industries, and countries. The indicators’ coefficients are listed in Figure 5, and all are statistically significant.

The additional gain in employment growth ranges from around 2.0 to 4.5 percentage points, suggesting that efforts to enhance skills and adopt new technology and innovation facilitate job growth. Statistical analysis also suggests that these four indicators are positively and significantly associated with labor productivity.
References


Endnotes

1 In this note small refers to 5-20 employees, medium-size to 21-99 employees, and large 100 or more employees.

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Source: Enterprise Surveys.

Figure 5: Gains in employment growth from enhancing skills and using technology and innovation (regression results)