

The \$250 billion question: Can China close the skills gap?

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Wu Hao owns a manufacturing company in Hebei province, not far from Beijing. He says his factory should have 130 employees but is perpetually understaffed. Despite increasing pay—his labor costs have risen 60 percent in the past three years—and despite searching hard for new hires at job fairs, he cannot find the workers he needs. Many university graduates, he complains, lack basic computer and technical skills, and are simply not ready to work. “Smiling and shaking hands: I have to teach this to people in their 20s and early 30s.”

* * *

In a crowded hostel on the outskirts of Beijing, six 20-somethings share a small room. All are from smaller cities or the countryside. All graduated from vocational school or university; all came to Beijing with big dreams. And all of their dreams are still unfulfilled. Xu Bo, 25, tells us, that he cannot even guess how many job interviews he’s had since leaving Jilin province a year and a half ago. Armed with a degree in sports management, he first moved to Guangzhou but failed to find fulltime work. Since then, Xu has worked in a series of short-term jobs, including insurance sales, cell-phone assembly, and gold-coin telemarketing, but every time the three-month limit for a tryout period expired, so did the job. “I haven’t used anything I learned in college,” he sighs. Now he and his roommates are paying \$2,400 for a training program in computer programming.

INTRODUCTION

What these stories show is how China’s changing dynamics—economic, social, and demographic—are creating a distinctive set of problems. Specifically, companies are failing to find the high-skilled workers they need, while individuals find themselves ill-prepared for the jobs that are available.

In a larger sense, however, these stories speak to a different, bigger question: what kind of country will China be? There is one certainty. As China evolves from an investment-led economy to a consumption-oriented one, from being the workshop of the world to, perhaps, being a services powerhouse, it will need more high-skilled workers, in particular post-secondary vocational graduates.

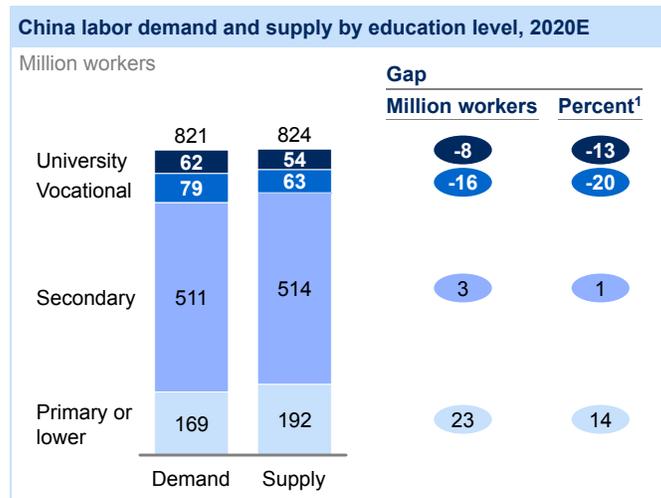
Companies know this because they are already feeling the pain, in a multitude of ways. One is higher costs. Manufacturing-labor costs in the Pearl River Delta, for example, rose 11 percent during 2011 and almost 8 percent last year. These gains were supported by productivity improvements, but low-end manufacturers are already looking elsewhere, such as India and Vietnam, as they begin to get priced out of China. In some ways, this is a good thing and a sign of China’s advancing prosperity. In fact, the national economic strategy is to emphasize higher-value, higher skilled work. That is what pays higher wages, and raises living standards, which is the point of growth. But there are consequences, both intended (richer workers) and unintended (skills shortages).

At the high end of the labor market, the striking fact is that while it looks like China is producing the professionals it needs, the numbers are deceptive. For example, in 2005, China graduated 600,000 engineers, but a report from the McKinsey Global Institute estimated that only one in ten were ready to work at a foreign multinational¹. We call this the “supply paradox”: there are shortages of good hires even though there appear to be plenty of qualified people.

1 Diana Farrell and Andrew Grant, Addressing China’s Looming Talent Shortage, McKinsey Global Institute, October 2005 (<http://www.mckinsey.com/insights/mgi>)

Exhibit 1

Demand for university and vocational labor in China is expected to exceed supply by ~24 million workers in 2020



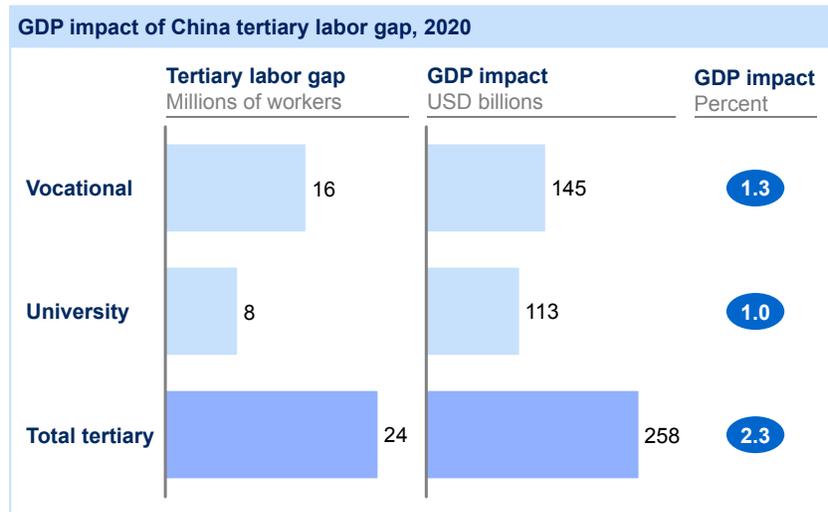
¹ Gaps are percent of demand for shortages, and percent of supply for surpluses
NOTE: Numbers may not sum due to rounding

SOURCE: China National Bureau of Statistics; McKinsey Global Institute analysis

A few figures tell the story. According to new McKinsey research, at the lower end of the labor market, in 2020 there will be 23 million more people than jobs suited for their limited education (primary school or less). At the upper end, we project that Chinese employers will demand 142 million more high-skilled workers—those with university degrees or vocational training—or about 24 million more than the country will likely supply. Companies could fill this high-skilled labor gap with less-skilled workers, but this would result in productivity losses or poorer quality products and services. Other companies may leave roles unfilled, delaying the decision to grow or expand. McKinsey estimates that if China does not bridge this gap by 2020, the opportunity cost could reach some \$250 billion (about 2.3 percent of GDP)—greater than the economic output of Hong Kong or Israel. That is an enormous amount of money—and talent—to leave on the table.

Exhibit 2

If China does not close its high-skilled labor gap, China could face an opportunity cost of ~\$250B, or 2.3% of GDP in 2020



SOURCE: National Bureau of Statistics; McKinsey analysis

WHAT'S THE PROBLEM?

The profile and attributes of China's labor force are not likely to fully meet the needs of the country's economy. The reason, in a word: mismatches.

One mismatch is geographic—and is a paradoxical result of China's success in raising tertiary enrollment. The number of students graduating each year from university or vocational school has risen remarkably, from 1 million a year in 2000 to 6.1 million in 2011². At the moment, in some places, this is too much of a good thing. The number of new graduates exceeds demand for their services in many areas of the country, resulting in an unemployment rate of 16.4 percent for college graduates (compared to a national rate of less than 5 percent)³. This is partially a matter of numbers, but it is also a matter of distribution.

The allure of thriving, fast-growing metropolises like Shanghai and Guangzhou is powerful; going east has become a rite of passage for ambitious youths from China's inland regions. But for many people—those without personal connections, or with degrees from lesser-known institutions—their provincial credentials are not good enough to crack these hypercompetitive markets. That is the story of many members of the “ant tribe,” the colloquial term for new college graduates (like Xu Bo and his roommates) who work hard at near-menial jobs for little reward and live crammed together in squalid conditions.

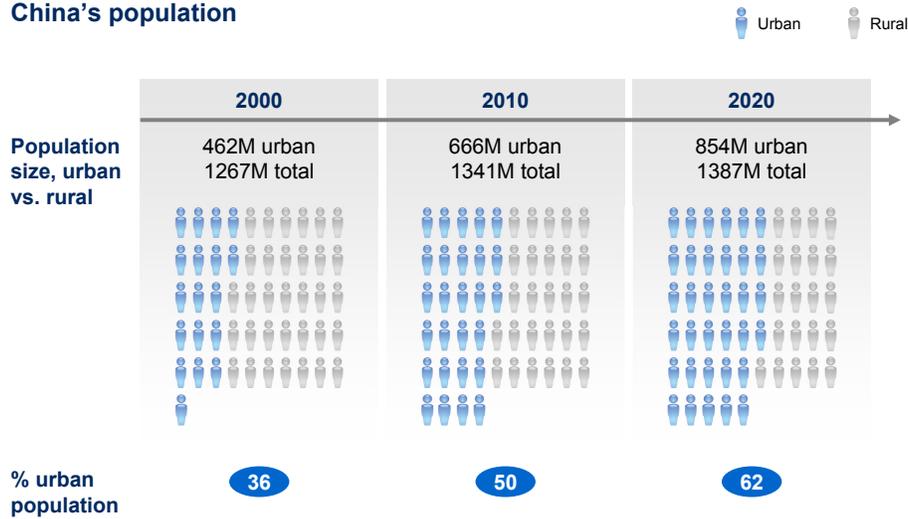
² China National Bureau of Statistics

³ China Household Finance Survey (for those aged 21 to 24)

The inevitable result: big cities have more high-skilled labor than they can use, and mid-size and smaller ones don't have nearly enough. This mismatch is particularly acute when one considers where future growth is likely to come as the character of China's urbanization changes. Specifically, we expect that in the

Exhibit 3

By 2020, over 850 million people will live in cities – approximately 60% of China's population



SOURCE: Insights China

next two decades, the top 40 cities will no longer generate the majority of urban growth, as they have done so far; instead, most growth will take place in the hundreds of smaller cities⁴.

A second mismatch has to do with the knowledge requirements of the future and the structural makeup of the work force. As China climbs the economic ladder, the rapid job growth it is already seeing in the services sector and knowledge-intensive manufacturing will increase the demand for high-skilled workers.

Right now, China graduates more university students than the economy can absorb. By 2020, due to demographics and sectoral shifts in the economy, that situation will flip, with about 8 million fewer university-educated workers than the country will need. The supply-demand gap will be even wider for vocationally-trained workers, with an expected shortage of 16 million people.

Changing that is a far more difficult challenge than simply putting migrants to work at low-tech machines, something that is not an option anyway. While migration to the cities will continue, it will slow down. "The supply of migrant workers will fall short of urban demand as early as 2015," Zhang Libin, an official with the Ministry of Human Resources and Social Security, told the People's Daily. "This is not a short-term and partial phenomenon, but a long-term and inevitable trend."⁵ Moreover, the low educational level of many rural migrants means that they will not have the skills that companies need.

4 Janamitra Devan et al, Preparing for China's Urban Billion, McKinsey Global Institute, February 2009, p. 21 (<http://www.mckinsey.com/insights/mgi>)

5 "Rising labor costs have only just begun," People's Daily, July 13, 2010

Demographic trends complicate matters. As the population ages, China's labor-force-participation rate will decline. At the same time, due to the one-child policy, the number of people in the work force will fall in absolute terms (as it did in 2012, by 3.45 million people)⁶. And it cannot bounce back any time soon—the next generation of workers has already been born. In short, just when China needs many more skilled and educated people, its population will actually be falling.

The third mismatch is between what employers want from graduates and what they are getting. Surveys of employers consistently show that they are not satisfied with the skill levels of their new tertiary hires, whether these are graduates of universities or vocational schools. The main complaints, according to McKinsey research (and a wealth of anecdotal evidence), are lack of technical training, inadequate English, and deficient soft skills, such as the ability to work in teams, critical thinking, and innovative flair. In 2013, more than a third of employers in China surveyed said they struggled to recruit skilled workers, with 61 percent of these companies attributing this to a shortage of general employability skills. “I’m in manufacturing, and we have the biggest challenge,” says Wu Hao, the Hebei manufacturer. “At school they don’t learn what they need to know to work at a company.”

Now consider the context: China is already seeing rapid job growth in the services sector and knowledge-intensive manufacturing, which both generally require higher skills. We project that the share of tertiary-educated workers in the manufacturing sector will double from 10 percent in 2010 to more than 20 percent in 2030—if China can produce them.

On the other end of the scale are the millions of rural migrants who are already in China's cities—the official estimate of the “floating population” was 236 million people in 2012—and those who are still to come. More than 60 percent of migrant workers in 2010 worked in the informal sector. Marginally connected to the urban labor system, they are not ready to step up to take on the more demanding jobs being created. This matters first of all in human terms—the lot of a perpetually insecure migrant is a difficult one. In broader economic terms, it matters because if this cohort cannot raise its game and develop the skills that suit a changing economy, China will lose out, too.

WHAT TO DO?

The Chinese government understands that it needs to improve education and training. In its National Plan for Medium- and Long-term Education Reform and Development, it outlined plans to expand vocational education, established a target of 90 percent secondary enrollment by 2020, and increased investment in secondary and university education.

A larger question, though, is about how China educates its young. There is growing concern—among parents, employers, and policymakers alike—that the system's emphasis on rote learning and high-stakes exam-taking does not foster the mental agility and innovative flair that the 21st-century economy will need.

Those doing business in China, however, cannot wait in hope that these issues somehow, get resolved. Companies need to take action themselves. And in fact, many are doing so. According to one industry

⁶ Statistical Communiqué of the People's Republic of China on the 2012 National Economic and Social Development, February 22, 2013 (<http://www.stats.gov.cn/>)

study, more than a quarter of employers in China, the most in Asia, have been adding staff training and development programs⁷.

McKinsey recently completed a research project on the transition from education to employment and studied 100 programs in 25 countries⁸. Based on our work, both globally and in China itself, here are a few principles for companies to practice:

Engage youth early. Where the required skill is rare or new, don't wait for the next generation to grow up and get interested: get to them while they are still in school. A number of industry-led programs expose youths to particular professions during secondary school, particularly junior and senior year. For example, South Africa's Go for Gold is an industry-wide effort of 20 engineering and construction companies; it seeks to attract young people into the field. The program identifies students while they are still in high school and gives them tutoring in math, science, and life skills. Once they finish secondary school, they work for a year at a member company to get some experience and test their interest. A company can then choose to sponsor them through college and hire them on graduation, all the while mentoring them. The industry gets a pipeline of talent, and the young people, many of them from disadvantaged backgrounds, get a foothold in a fast-growing sector.

Run intensive boot camps. We are seeing a new phenomenon of short skill-based programs, on the order of eight to 12 weeks, that focus on the small set of particular skills that matter the most for the profession in question. Dev Bootcamp is a new, privately-run nine-week computer-programming course that takes students of widely different ages and backgrounds. No previous computer-science background is needed, and some participants have only a high school degree. Dev Bootcamp describes itself as an "apprenticeship on steroids"; the goal is to graduate "world-class beginners." The program is run by skilled coders; management spends considerable time with employers to understand their changing needs. This input shapes Dev Bootcamp's output, to ensure that it delivers what employers want.

For their \$12,200 tuition, participants train at least 40 hours a week (sometimes as much as 70-85 hours per week), in a combination of project work, tutorials, teamwork and "soft-skills" training to make them job-ready. At the end of 2012, Dev Bootcamp said it had placed more than 90 percent of its graduates, at an average starting salary of \$83,000.

Similarly, Wipro, the Indian information-technology powerhouse, fills 15,000 engineering positions per year. Around 30 percent of its recruits do not have engineering degrees; they go through a 12-week intensive training program to get them to a productivity level that is close to that of those who do. And China is in good position to develop its own bootcamps because the for-profit education and training market is developing rapidly, with revenues expected to exceed \$115 billion in 2013. Private vocational schools, in particular, are attracting venture capital and other forms of private funding, in specialties ranging from auto repair to cooking.

The boot-camp model could be particularly helpful for university graduates like Xu Bo to make themselves more attractive to employers. It could also work for ambitious lower-skilled workers. One of the beauties of boot camps is their variety. They can be done on a for-profit or nonprofit basis; by industry, entrepreneurs, or governments; and for sectors ranging from software development to plumbing. Regardless of job or

7 2012 Talent Shortage Survey, ManpowerGroup, 2012 (www.manpowergroup.us)

8 Mona Mourshed, Diana Farrell, Dominic Barton, Education to Employment: Designing a System that Works, McKinsey Center for Government, 2013 (www.mckinseyonsociety.com)

supplier, the keys are to get employers involved early, emphasize learning through practice and simulation, and assess proficiency on the basis of skill demonstrations to ensure that graduates are ready to work.

Create your own talent pipeline. When needs are specific and proprietary, companies may be best served by doing it themselves. For example, Newport News, a ship-building company based in the state of Virginia in the United States, recruits students to its four-year Apprentice School program that teaches 19 different high-skilled trades. While they learn, students also work at the shipyard. The program breeds tremendous loyalty: 80 percent of graduates are still employed by the company ten years later, and a large percentage of senior management attended the program.

China also has relevant examples. Since 1978, the China National Petroleum Company (CNPC) has run the China Petroleum Pipeline College, a vocational school to train CNPC employees, as well to provide one-off courses for other companies. The school has an enrollment of about 5,000 students who do everything from university-level courses to general vocational education, all related to pipeline construction and service. China South Locomotive and Rolling Stock Corporation established a postsecondary vocational school last year to train its own employees and those of its clients. It aims to enroll 1,000 students a year.

Partner with other players in the industry, including competitors. It's relatively simple to train a worker on a sewing machine or other basic technology. But as manufacturing becomes more complicated, so does the training required — and it also becomes more expensive. One proven way to deal with these issues is to work with others; this spreads the costs and makes scaling up easier.

In July 2012, Chalco, a Chinese state-owned aluminum company, and the China Nonferrous Metals Industry Association announced the formation of the China Aluminum Vocational Education Group, an industry-wide organization to research and promote training improvements. This is the first time a large state-owned enterprise has taken the lead in forming an industry-focused vocational group.

As in this case, some of the most powerful solutions we have seen are those where leading employers come together to define the skills that they need and then work with local education providers to shape the curriculum. That is the story behind the Automotive Manufacturing Technical Education Collaborative. This is a joint program of 30 community colleges and major car makers that operate in the United States to prepare students for careers in high-end auto-manufacturing skills. Skilled technicians from the companies involved developed a curriculum based on 110 common competencies. They also agreed on a standard set of evaluation metrics to create respected, transferable credentials.

Collaboration can also be done on a for-profit basis. China Vocational Training Holdings is a private company, founded in 1995, that works with car makers to provide training to 100,000 students a year⁹. Through partnerships with almost 2,000 companies in the automotive sector, it provides more than half of the industry's new workers. It has set up schools all over the country and found interest among private-equity investors, raising \$15 million for expansion in 2010.

Finally, another approach to consider is sharing. Small- and medium-size enterprises (SMEs) often struggle to develop effective training, a deficiency that has consequences for their customers. One interesting trend is that of large companies giving SMEs access to their training programs. For example, SK Telecom,

9 Dominic Barton, et al, *The World at Work: Jobs, Pay, and Skills for 3.5 Billion People*, McKinsey Global Institute, June 2012 (<http://www.mckinsey.com/insights/mgi>)

a leading telecom player in South Korea, has allowed 300 of its suppliers to participate in more than 100 technical and soft-skills training programs. By helping to improve the skills of its suppliers, SK Telecom gets better goods and services down the line.

CONCLUSION

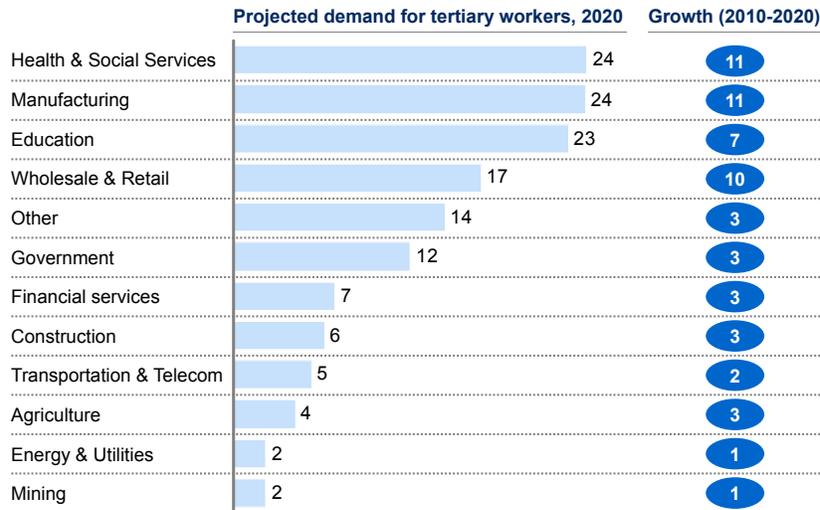
China's late-20th-century economic strategy relied on moving people from farm to city and putting them to work in factories. Because the flow of migrants seemed endless—the labor force grew from about 600 million people in 1980 to almost 940 million people in 2012—companies could find new, reliable, and inexpensive workers. Under these circumstances, productivity gains were inevitable, since nonfarm jobs are much more productive than small-scale agriculture. In addition, China improved the quality of its human capital considerably. The proportion of Chinese workers with a secondary school diploma, for example, rose from roughly half in 1990 to about 60 percent in 2010.

This phase of China's economic evolution is nearly over. Given the trends discussed—fewer migrants, a

Exhibit 4

Demand growth for tertiary-educated workers will be strongest in the service and manufacturing industries

Millions of workers



SOURCE: China National Bureau of Statistics; McKinsey Global Institute analysis

higher-value economy, and a shrinking labor force—throwing together more people and more machines will no longer be enough. China will need to be more productive. Its fewer workers will need to be better ones, and their skills must be suited to the faster-growing sectors of the economy, such as high-end manufacturing, wholesale and retail trade, health, and education.

In short, if China does not figure out how to narrow or close the skills gap, it risks getting tangled in the “middle-income trap”—that is, failing to create the wealth that could vault it into the ranks of developed countries.¹⁰

Two scenarios face China. In the first, China continues to urbanize, and the new city residents find their place in the economic pecking order; they go on to improve their lives and those of their children. Living standards rise; poverty falls—and the global economy benefits, too, in the form of increased demand. The country would go a long way toward achieving what President Xi Jinping calls the “Chinese dream.”

The other scenario is darker. In this one, China continues to urbanize, but the new residents are shut out of formal employment because they do not have the education or skills employers are looking for. Adrift and anxious, they become a restive social force, unsuited to the city but unwilling to go back to the village. Inequality widens; resentment festers. Think of Xu Bo and other members of the “ant tribe.”

To sustain its success and avoid this scenario, China needs to bridge the skills gap. It has at its disposal two formidable advantages. One is that this is an area where industry and the private sector have every incentive to step up. The other is that there are solutions to this problem. There are good examples of what works, and why, from countries rich and poor, and in just about every industry. These solutions can be readily adapted and scaled up.

And if China fails to do so? That would be a \$250 billion mistake.

¹⁰ Dominic Barton, et al, *The World at Work: Jobs, Pay, and Skills for 3.5 Billion People*, McKinsey Global Institute, June 2012 (<http://www.mckinsey.com/insights/mgi>)

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