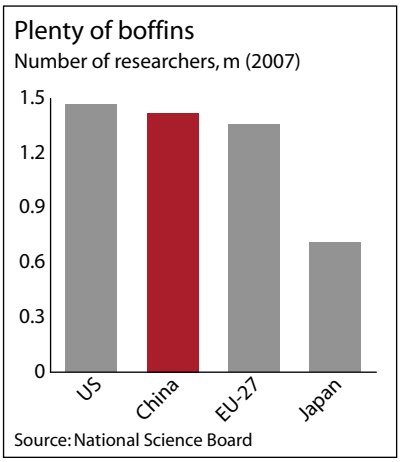
Human resources

National talent safari

by Denis Fred Simon and Cong Cao

China possesses a large and increasingly capable talent pool. Its universities have been producing better prepared graduates, especially in science and engineering, every year since they began rebuilding in the early 1980s. China has 52m people working in science and technology, more than anywhere else in the world. But this does not preclude a troublesome reality: China faces a formidable human resources challenge.



There are three reasons for this puzzling state of affairs. First are the lingering after-effects of the Cultural Revolution (1966-76), when Chinese universities shut down for a decade, resulting in a dearth of experienced technical specialists and R&D managers. Second is the "brain drain" of talent abroad, which has constrained domestic access to the best and brightest human resources within China. And third is the huge expansion in the number of students over the past decade, which has outpaced improvements in quality. Policy makers view solving these problems as part of the wider struggle to lessen China's dependence on wasteful investment and low-end manufacturing, creating instead a knowledge-driven economy with technological innovation at its core. China's future economic progress, they believe, must start with addressing the country's talent shortage.

Spot the genius

Nurturing talented scientists, engineers and professionals is a priority for China's leaders

Nurturing top talent is now a priority for China's leaders, judging from the recent flurry of slogans dreamed up to motivate officials. Policy makers plan to "Rejuvenate the nation with science, technology and education" (*kejiao xingguo*) and "Empower the nation through talent" (*rencai qiangguo*). Even the Chinese Communist Party (CCP), whose remit for managing human resources is traditionally limited to administering Party cadres, has extended its authority into the professional sphere. In an unprecedented move, the CCP Central Committee held conferences on talent in both 2003 and 2010, and established a high-level "talent task-force" under its Organization Department.

In June 2010, the CCP Central Committee joined the State Council in unveiling a comprehensive talent plan to transform China from the factory of the world into a global center of innovation – from "Made in China" to "Developed in China." The Medium and Long-Term Plan for the Development of Talent (2010–2020) (MLP) was formulated with the participation of some 30,000 people over two years. By 2020, China aims

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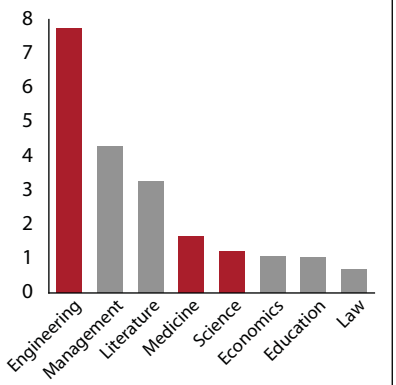


to nurture 40,000 top scientists and engineers, double the proportion of the workforce with higher education to 20%, and boost government spending on human resources development from today's 11% of GDP to 15%. The plan is to make China a global leader in innovation by 2020.

The MLP introduces a portfolio of measures designed to train and use talent to its full potential. These policies include boosting investment in human resources; nurturing innovative talent via more collaboration between industry and academia; supporting entrepreneurial activities; and protecting intellectual property rights. This systematic attempt to nurture talent follows a string of *ad hoc* programs rolled out by individual ministries since the mid-1990s, all of which come with considerable incentives, resources and honors attached. These include the Ministry of Education's Cheung Kong Scholar program, the Chinese Academy of Sciences' Hundred Talents program, and the Ministry of Human Resources and Social Security's Thousand Talents program. The aim is to reverse China's brain drain by bringing back specialists capable of making breakthroughs in key technologies, developing high-tech industries, and pioneering new disciplines. Recruitment efforts were also stepped up during the global financial crisis to lure back financial, legal and other professionals engaged in global business.

Politics: the elephant in the room

For all that China's technocrats have done in the past two decades to improve the nation's research system, one haunting question remains: can China produce world-class research under its current political system? The answer is, largely, no.

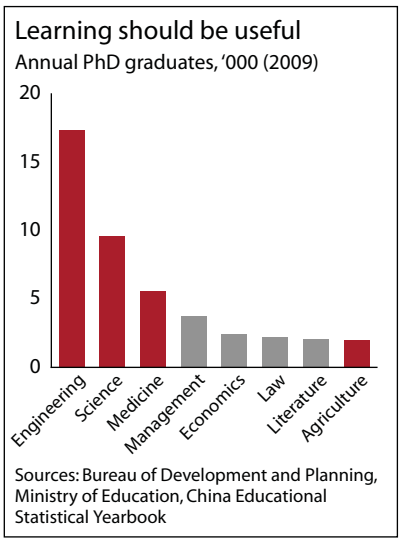
China's leadership is determined to improve the quality of China's talent pool, and it understands that minimizing overt political interference in the scientific environment is vital to achieving that goal. That means reducing bureaucratic meddling and enhancing the space for creative research will continue to be priorities. But the success of these policies will depend heavily on maintaining a benign political environment that nurtures confidence among the country's scientific and technical elite. On the whole, the current political regime has done a good job over the past 20 years of instilling confidence among scientists so that they can focus on research rather than politics. In some cases, government policies have even helped to reinvigorate a commitment among top scientists to the Chinese Communist Party regime.

Yet the recent crackdown in China associated with the so-called "Jasmine Revolution" has eroded some of this confidence. Tighter restrictions on the internet and more obvious limits to freedom of expression have created a chill inside the scientific community. Admittedly, those ensconced within the system have little choice but to go about their work with a hopeful spirit. And the good news is that researchers have not been cut off from the international scientific and technical communities: cross-border research continues unabated. But the same cannot be said for those overseas scientists and engineers contemplating a return to China. New apprehensions have clearly emerged that could reduce the momentum of China's growing "brain gain." The risk is that China's reflexive authoritarianism will short-circuit the transfer of technologies and entrepreneurial skills needed to transform its economy.

Chinese universities are increasingly investing in world-class facilities, but that is not enough to transform them into world-class research institutions. For this to happen, Chinese universities must become like other top universities around the world: they must be governed by professors (not by a party secretary) and they must foster genuine freedom of thought and research.

Sadly, China's higher education system does not champion such universal values. The prevailing educational philosophy today is not dissimilar to that in the final years of the 19th century, when late-Qing reformers advocated grafting Western technology onto Chinese roots (*zhongxue weiti, xixue weiyong*). History proved that a failure, and it will continue to do so. Fundamental political reforms are needed to create an environment in which China's researchers can fulfill their world-class potential.

These policies show the tremendous effort that China's political and scientific leadership is making to address the country's evolving talent challenges. But the results have been mixed at best. China has been unable to lure back many of the truly best and brightest expatriate Chinese – those with high-level appointments at foreign universities and in multinational corporations. In addition, many of those who have returned only do so on a part-time basis. Unsurprisingly, they are hedging their bets as to whether the current pro-science, pro-innovation environment will be maintained in the future.



They don't make rocket scientists like they used to

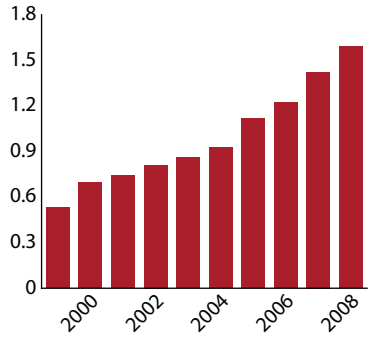
Senior Chinese leaders are unhappy about the overall pace of progress in science, technology, innovation and higher education, especially given the rapid and sizable increases of investment into these areas. They view the lack of genuinely world-class talent as the key problem. Few researchers working in China today match the stars of the past: Qian Xuesen, father of China's space technology program; Li Siguang, founder of geomechanics; and Deng Jiaxian, a driving force behind China's nuclear weapons program. The failure to attract sufficient numbers of high-quality scientists and other professionals was behind the surprising decision of the CCP's Organization Department to help initiate the Thousand Talents program, thereby turning itself into a global headhunter. The program, which began in 2008, pledges to bring back some 2,000 high-end Chinese researchers within 10 years.

The problem is that attracting high-end talent and technology requires an open and dynamic personal and professional environment. If China expects talent to play a key role in transforming its economy toward knowledge-driven growth, it needs to nurture an environment more conducive to innovative research and entrepreneurship. Simply handing out perks, no matter how lucrative they are, cannot substitute for a genuinely supportive and creative environment. Shi Yigong, a Thousand Talents recruit who resigned his chair at Princeton University to return to Tsinghua University, says the Thousand Talents program should aim to "kill two birds with one stone" – not only raising the level of scientific research, but also improving the academic environment in China. Returnees complain that China's universities are plagued by petty jealousies and put too much emphasis on quantitative performance metrics.

Transforming Chinese academia will require allowing intellectual freedom – a tricky task for a government that locks away artists

Transforming the culture of Chinese academia, which currently emphasizes relationships rather than achievement, is a daunting task. Three things need to be done. First, practitioners need to be able to exchange information and ideas, both within and across institutions. Second, research needs to focus on long-term vision rather than instant results. Third, the research process needs to encourage risk-taking and tolerate "failure." In addition, university governors need to stamp out rampant misconduct in Chinese science. Plagiarism, falsification and fabrication of data, exaggeration of research findings, and conflicts of interest have all tarnished the image of China's scientific and engineering

Ramping up
Number of scientists and engineers engaged in R&D activities, m



Source: NBS, Ministry of Science and Technology

communities, raising doubts about the validity and credibility of research results. Chinese scientists also have the nasty habit of promoting commercial products of often dubious quality.

Squadrons of scientists, battalions of engineers

Policy makers believe that returnees will help to drag up standards. But domestic researchers often grumble that, while those who sought glory and fortune abroad are showered with benefits, those who stayed behind are discriminated against. Since staff with foreign degrees and experience are favored for recruitment and promotion, the implication is that degrees earned at home are less valuable. The result is that more domestic-degree holders are going abroad simply for the sake of securing similar perks and promotions when they return (if they do at all). The success of the various talent-attraction programs will not be measured merely by how many top-notch talented individuals return home, but by whether they prove a catalyst for positive change across the Chinese research system.

Creating a healthier research environment is more important than ever as competition from China's 1,250 foreign-run research centers heats up. A new type of internal brain drain has emerged since multinational

Lie back and think of China

The Thousand Talents program aims to lure back some 2,000 expatriate Chinese under the age of 55. It targets full professors at well-known foreign institutions of learning, experienced corporate executives, and entrepreneurs who possess core technologies. With an overseas talent pool approaching 100,000, policy makers believe the 2,000 target is achievable. But they are finding it more difficult than they thought to persuade outstanding individuals to return.

Under the scheme, each recruit receives Rmb1m as a startup subsidy, plus housing and a salary close to what he or she received overseas. In addition, they will be honored with a national title. By early 2011, the program had signed up more than 1,100 Chinese expatriates with impeccable credentials, of whom over 80% were foreign nationals. Wang Xiaodong, a prestigious Howard Hughes Medical Institute investigator and member of the US National Academy of Sciences, is one famous recruit.

In late 2010, a new component was added to the program targeting aspiring scientists and engineers aged under 40. Recruits must have a doctorate from a good foreign university, at least three years overseas research experience, and a formal appointment at a respected foreign research institution or company. They will be required to work full time at a Chinese institution in return for a subsidy of Rmb500,000 and a research grant worth Rmb1-3m. In addition, policy makers plan to launch a new "Thousand Foreign Talents" program aimed at bringing high-end foreign scientists, engineers and managers to China.

Government officials and Party cadres have worked hard to ensure the success of this global talent-spotting scheme, but they have been forced to reach deeper into the barrel than they hoped. The program originally wanted to attract only full professors at prestigious foreign universities, but now targets full professors, or even associate professors, irrespective of their institution. Preferable treatment originally set for new recruits was extended retrospectively to earlier returnees, and the full-time employment requirement reduced to six months (although many recruits actually spend only a couple of months in China). All of these changes not only significantly depart from the original goal of the program, but also cast doubt that it will succeed in encouraging outstanding expatriates to return to China permanently.

The retreat reflects the reality that most researchers and entrepreneurs targeted under the Thousand Talent program do not find the Chinese research and business environment attractive enough to move back, despite the lucrative rewards being offered to them. Fear that recruits might be negatively perceived by their foreign employers, or even lose their positions because of possible conflicts of interest, has not helped. The Organization Department even declines to make the formal list of the supposed stars brought back by the Thousand Talents scheme public. China's brain gain has begun, but only slowly.

companies began outsourcing significant amounts of R&D to China, provoking a "talent war" for well-trained scientists and engineers. As Chinese universities and domestic enterprises both lose out to higher-paying foreign competitors, policy makers are beginning to question the growing presence of foreign R&D activity on Chinese soil. How this plays out will depend a great deal on the degree to which China's own indigenous innovation efforts yield the desired results.

On current evidence, China will struggle to solve its talent shortage

Demand for high-level scientists and engineers will only intensify as China's economy becomes more technologically sophisticated. But even if China solves its talent shortage – and the current evidence suggests it will struggle to do so – it still has to learn how to realize the potential of its deepening talent pool. Creating an environment conducive to scientific discovery and technological innovation will require more than bucket loads of cash: scientists need the freedom to think, explore and collaborate in a truly meritocratic environment. Returnees have a role to play in bringing about this culture change, but their impact will be limited. Wider reforms are needed to fulfill China's dream of becoming a global leader in innovation.