



# Science, Technology, Education and Health News from China

## Number 120 – June 2014

Please note that the previous newsletters can be downloaded from the website of the Embassy of Switzerland in China: [www.eda.admin.ch/beijing](http://www.eda.admin.ch/beijing)<sup>1</sup>. To subscribe/unsubscribe or send us your comments, please send an email with the corresponding subject to [chenchen.liu@eda.admin.ch](mailto:chenchen.liu@eda.admin.ch).

### Introduction

The Story of the Month focuses on China's strategic plan for vocational education development. Also in education this month, the national college entrance examination takes place; state media published editorial to address questions and doubts over Confucius Institutes. In science and technology, China invests heavily on protein research; China eyes to become high-tech exporter; China looks to "hack-proof" quantum communications in the post-snowden era.

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<sup>1</sup> Please click on the blue texts to activate the hyperlinks to either email addresses or related websites.



## Story of the Month

### Vocational Education Development Strategy 2014 – 2020 Announced

As the State Council holds the third national vocational education conference in June with the participation of top national leaders, State Council has announced its *Decision on Accelerating the Development of Modern Vocational Education (19/2014)*, together with *Towards Modern Vocational Education Development Strategy: 2014-2020*, a policy roadmap jointly announced by the Ministry of Education, National Development and Reform Commission, Ministry of Finance, Ministry of Human Resources and Social Security, Ministry of Agriculture, State Council Poverty Relief Office.

Compared to the previous *version Towards Modern Vocational Education Development Strategy 2012 - 2020 (draft)* which was circulated internally for input, the official strategy is proven more radical, targeted and to-the-point. The development strategy drew a roadmap for China's dual track education which confirmed the government's commitment to prioritize the creation of Universities of Applied Sciences and to make transitional options open for students in both tracks by reforming admission and examination system.

In the near future, the proportion of junior high school graduates enrolled in general track and TVET track is expected to remain around **50%: 50%**. For professionals to have broader access to further education opportunities, the development strategy sets a long term goal to increase the percentage of students with professional experience at higher vocational education institutes from 5% (2012) to 20% (2020). UAS, TVET colleges and academic universities will be encouraged to admit more students from vocational track.

According to the strategy, the priority areas for vocational education lie in modern agriculture, advanced manufacturing, service industry, strategic industries, energy, transportation, ocean industry, social management and creative & culture industry.

The wide-spread rumor that "all 600 local universities will be transformed into Universities of Applied Sciences" eventually was not confirmed by the policy document despite heated discussions among public. On the development strategy, UAS is defined as "a key component of the higher education sector, equal with academic universities."

As the strategy states now, local universities that positioned themselves as "service industry-oriented, supporting local economic development" are encouraged to initiate comprehensive reform and move towards UAS. Universities could choose to either transform completely or to start with a pilot reform project targeting at particular department or academic program. As an alternative to institutional reform, academic universities are expected to work with UAS and vocational colleges to develop joint education programs and train highly skilled talents.

For the Ministry of Education, one of the priorities this year is to select pilot reform projects at the provincial level and the national level. Another priority is to conduct research on standard-setting for UAS, including university accreditation, curriculum development, faculty, infrastructure and quality assessment. Such research will become a basis for a separate set of management guideline for UAS in the future. The government dialogue with Germany and the Netherland is confirmed. On top of bilateral dialogue, establishing contact and strengthening communication with UAS Unions and Associations abroad is also emphasized.

<sup>2</sup> [http://www.moe.gov.cn/publicfiles/business/htmlfiles/moe/moe\\_630/201406/170737.html](http://www.moe.gov.cn/publicfiles/business/htmlfiles/moe/moe_630/201406/170737.html)



## News

### 1. China putting its college entrance exam to the test

(China.org.cn, 09-06-2014)

An army of almost 9.4 million examinees, slightly less than the population of Sweden, had their dreams put to the test by China's annual college entrance exam over the first weekend of June. Gaokao, as the exam is known, is under examination, too. Increasingly criticized for its role in focusing the national education system on exam results rather than genuine quality, gaokao is having its biggest overhaul since it resumed in 1977, the year after the "cultural revolution" (1966-76) ended. The keyword to reform could be decentralization. Shanghai took the lead in running its own gaokao in 1985, and now about half the country has followed suit, with the rest retaining the unified "national" exam. In 2003 Tsinghua, Peking and 20 other universities were given limited rights to set their own admission standards, meaning 5 percent of freshmen were selected not solely according to their gaokao scores. Applicants with outstanding performances in provincial or even international science Olympiads could earn themselves credit and increase their chances of being enrolled by a prestigious university, even though their Chinese literacy or English might not be up to scratch. Extra credit can also come from artistic or sporting talent. Diversifying standards and opening the college door to a wider set of applicants with special talents was a good idea, but was scandalously abused by some universities. Cai Rongsheng, former head of admissions at Beijing's Renmin University of China, was arrested on May 30 on bribery charges. Cai was put under official investigation in November 2013 and Renmin suspended its private admissions for 2014 soon after. Cai is accused of taking over 10 million yuan (US\$1.62 million) to "help" students during recruitment. Gaokao is swamped by waves of doubt on admission transparency and fairness. Supplementary scores, in particular, have increasingly been put under the microscope. Due to lack of supervision, what were once rights of universities to admit whoever they chose, turned out to be tradable privileges for those who could afford them and led to corrupt admission procedures, said Wang Feng, charged by the Ministry of Education with the task of reforming the system. Deng Xiuxin, president of Huazhong Agricultural University, criticized some practices in art exams. Random sketches are easily declared masterpieces by examiners bought off in advance.

"People who are not art experts have no idea about the fraud," Deng, a deputy to the National People's Congress, said during this year's NPC session. Xiong Qingnian, of Fudan University, wants third parties to watch over and evaluate the admission process. It will take time for his suggestion to come to fruition, but meanwhile, 31 education authorities have cut the items that earn applicants extra admission credit. In southwest China's Guangxi Zhuang Autonomous Region, first prize winners in national science Olympiads will no longer be given extra points. Guangxi started to readjust its policy in 2011. Winners of provincial science and technology contests and students who won merit for good virtue are no longer given extra marks. Guangdong Province has trimmed its items to six from 23 this year, meaning the number of applicants who can get extra scores will drop by more than 90 percent. However, there are calls for preferential treatment for gaokao examinees from rural areas where education resources and quality are often inferior. During the annual NPC national session this year, Chinese Premier Li Keqiang vowed to increase by at least 10 percent the number of rural students from poor areas enrolled in key universities.

([http://www.china.org.cn/china/2014-06/09/content\\_32607859.htm](http://www.china.org.cn/china/2014-06/09/content_32607859.htm))

### 2. China pours money into proteins

(Science, 10-06-2014)

Hoping to create an encyclopedia of proteins in the human body, China's Ministry of Science and Technology kicked off on the 10<sup>th</sup> of June a \$40 million effort to map the human proteome—the full



complement of proteins—of 10 major organs and tissues, including the heart and liver, in healthy and diseased states.

Qin Jun, director of the Beijing Proteome Research Center, which will oversee the effort, compares the quest to the gargantuan effort of mapping the human genome. Whereas genomes provide the “code of life,” proteins execute the orders of life, he says. “Proteins are the workhorses in the cell, and are more directly related to disease and human function” than genomes, he says. Chinese researchers contributed just 1% of data to the global Human Genome Project, but Qin hopes China can play a more significant role in the ongoing Human Proteome Project, a global effort that published a draft map of the human proteome online in Nature on 28 May. The goal, he says, is for China to eventually contribute “at least 30% of data” to the international effort.

China is well positioned to take advantage of “the start of the era of big data and bioinformatics,” says He Fuchu, chief scientist of the Beijing Proteome Research Center. The massive proteome effort, which He is leading, will run 3 to 5 years and involve about 200 researchers at 40 labs nationwide, he says. Construction is under way on two major supporting research facilities in Beijing. The \$200 million National Core Facility for Protein Sciences, nicknamed PHOENIX, will house 25 mass spectrometers and have the capacity to sequence 10 proteomes per day, and is scheduled to launch as early as mid-2015. Also expected to open next year is a bioinformatics hub, the National Center for Biomedical Big Data.

(<http://news.sciencemag.org/asiapacific/2014/06/china-pours-money-proteins>)

### 3. **Post-Snowden China looks to 'hack-proof' quantum communications**

(SCMP, 13-06-2014)

Ten months after Edward Snowden revealed the extent of the US' global surveillance programme, China started to build the world's longest quantum communications network, transmitting signals some 2,000km from Beijing to Shanghai. Pan Jian-Wei, a quantum physicist with the University of Science and Technology of China who heads the project, told the journal Nature in April that the network would “provide the highest level of protection for government and financial data.” China is plans to launch the world's first quantum satellite, the Chinese Quantum Science Satellite, in 2016, Pan said. It will test how to teleport quantum particles from the space to the earth.

China is not alone doing this. A Switzerland-based start-up, ID Quantique, last October installed a 650km quantum link in the US, media reported. It is now looking to secure funding to build a network linking all major US cities, which could exceed 10,000km. Quantum communication, which transfers information by using a technology called quantum key distribution, is the holy grail of data encryption. Theoretically, it is impossible to hack. In quantum mechanics, connections are made between two points when photons of light become entangled. This creates an encryption key that can be used to send the message through normal channels. If somebody tries to spy on that quantum communication, the connection is so fragile it disrupts the entanglement - letting both the sender and the receiver of the message know someone is snooping. While the technology has been tested and developed by countries around the world for decades, to the general public it is something from the science fiction. The Snowden incident suddenly brought the technology in the spotlight and strengthened national governments' determination to pour more resources into developing the technology. Revelations by Snowden that the US is targeting “network backbones”, through which huge amounts of data are transmitted, convinced Chinese leaders that developing the next generation of internet infrastructure was a policy priority. Shortly after the Snowden incident, mainland scientists involved in the quantum programme told the South China Morning Post that the central government “will definitely speed up the research into quantum communications.” There were still some hurdles to overcome. For instance, the quantum state of photons is very “fragile” and can easily get lost in long distance travelling. The bandwidth of such networks is also limited, making it difficult to transmit large amounts of data. But scientists have made remarkable breakthroughs in the last few years that will make real-life quantum communications feasible. The UK National Physical Laboratory in Teddington earlier demonstrated in a field trial that it was possible to achieve quantum communications on existing fibre-optic infrastructure. The scientists have successfully increased the



network speed while greatly reducing signal noise. Despite of these breakthroughs, Professor Gao Fei, director of the State Key Laboratory of Networking and Switching Technology at Beijing's University of Posts and Telecommunications, said most of the quantum networks were still in the experimental stage. He also said there were still flaws in the system that hackers could potentially exploit. For instance, an intruder could "blind" the photon detector at the receiver's end with a laser device and intercept the key files without triggering an alert. The Chinese scientists have been trying various hacking techniques and tactics to test for weaknesses in the system. "Existing quantum communication devices have their soft spots. There will be some way to go before the large-scale implementation," he said. Potential users of the technology, such as governments and banks, might still have to rely on conventional networks in the near future before scientists sort out the remaining issues. "Quantum communication technology alone cannot solve the problem of cyberespionage because it only guarantees the safety of key files in transmission," Gao said. A network's routers and servers may still be susceptible to breach.

(<http://www.scmp.com/news/china/article/1531161/post-snowden-china-looks-hack-proof-quantum-communications>)

#### 4. **China's sovereign wealth fund to focus on agriculture, technology and infrastructure**

(Out-Law, 20-06-2014)

China's sovereign wealth fund is shifting its focus to invest in agriculture and global food supplies according to China Investment Corp (CIC) chairman Ding Xuedong. CIC, which was established in 2007, has recently focused its attention on energy, metals, mining and the other commodities required to support China's industrial rise. But now the \$650 billion sovereign wealth fund wants to invest more in agriculture around the world and "across the entire value chain", Ding has said in an opinion piece in the Financial Times. In addition, CIC will focus on technology, infrastructure and real estate investments which offer long-term stable returns. "China Investment Corporation is a long-term financial investor with a diversified portfolio," said Ding. "We believe the agriculture sector offers stability, a way of hedging against inflation and a device for spreading risk. We are keen to invest more across the entire value chain – in partnership with governments, multilateral organisations and like-minded institutional investors – in areas that will help to unlock the industry's potential, increase the food supply and offer attractive returns." "While we are focusing on existing assets, we are also keen to work with the right partners to invest in greenfield projects," Ding said. "Food security is a global issue that no one can afford to ignore. The countries of the world must do more to make sure that their growing populations will have enough food. However, an unmet need is an investor's opportunity. And investors everywhere will prosper if they can help the people of the world meet one of the most basic needs of all." The fund's new strategy is in line with the priorities of the current Chinese administration which wants to shift the economy from one which is reliant on infrastructure investment and towards a primarily consumption driven model, with an emphasis on rising living standards, said the newspaper. According to Ding, who became chairman of CIC a year ago, China aims to create partnerships with governments, multilateral organisations and other institutional investors as it moves forwards with the strategy. He said that the government is keen to "shore up food security in places that we invest in and contribute our share to local job creation and economic growth". CIC will pay particular attention to areas of agriculture such as irrigation, land transformation and animal feed production, he said. A number of Chinese companies, most of them state-owned, have invested heavily in farmland and food production in Africa, Asia and Latin America and other parts of the world in recent years as China experiences increased demand for meat, dairy, grains and other soft commodities, said the Financial Times. According to the newspaper CIC had around \$650bn of assets under management at the end of 2013, around \$200bn of which was invested outside China. Much of the rest is made up of CIC's holdings in China's largest financial institutions, which the fund holds on behalf of the state, said the newspaper. Ding is currently accompanying Chinese premier Li Keqiang on his first official visit to the UK as premier.

(<http://www.out-law.com/en/articles/2014/june/chinas-sovereign-wealth-fund-to-focus-on-agriculture-technology-and-infrastructure/>)



## 5. China eyes to become high-tech exporter

(Xinhua, 20-06-2014)

High-speed rail were once again buzzwords in Chinese diplomacy this week as they were included in a joint statement issued in London after a meeting between visiting Chinese Premier Li Keqiang and British Prime Minister David Cameron. This was not the first time that Li has promoted China's high-speed rail technology to other countries during overseas visits, but it was the first to a Western developed country. In the document, the two sides agreed to promote cooperation on design and construction of railways, including high-speed rail, paving the way for Chinese enterprises to participate in one of Britain's largest infrastructure projects HS2 (High Speed 2), a rail project linking London and the north of England. High-speed rail has become a new "image card" for China. A video of a Chinese bullet train made its way to Times Square, New York, this year, showcasing the advanced equipment. Behind the "high-speed rail diplomacy" is China's endeavor to shift from labor-intensive and low-end manufacturing to an innovation hub for high-end technology. Apart from high-speed rail, Britain, the cradle of the Industrial Revolution, also expressed a willingness to welcome investment in energy, particularly nuclear, offshore wind power and photovoltaic projects, the joint statement said. During Li's trip, trade and investment deals worth over 30 billion U.S. dollars were signed between Chinese and British firms in areas of finance, technology, education, energy and infrastructure. "China is striving to grasp the opportunities brought by a new technological and industrial revolution," said Liang Xiaohong, Party chief of the China Academy of Launch Vehicle Technology, Liang said the Chinese leadership has a strategy to boost innovation-driven development, and promoting advanced technologies including high-speed rail to other countries is part of it. Addressing a biennial conference of the country's two leading think tanks earlier this month, President Xi Jinping said the direction of China's sci-tech development is "innovation, innovation and innovation." China must catch up with new developments in sci-tech innovation and try to become a leading force, said Xi. After growing to become the world's second largest economy, China is now seeking to shed its image as a "world factory" and inject vitality into the country by grasping opportunities the technological revolution offers.

Money has been pouring into innovation. Expenditure on research and development (R&D) topped 1 trillion yuan (about 168 billion U.S. dollars) in 2012, about 1.97 percent of gross domestic product (GDP). It surpassed 2 percent for the first time to reach 2.05 percent in 2013. China plans to become an innovative country by 2020, when scientific progress is predicted to contribute 60 percent of the nation's economic development, and R&D investment will jump to 2.5 percent of GDP, according to a government sci-tech development document. The contribution to China's economic development from scientific progress has increased from 39 percent in 2011 to nearly 52 percent at present, official statistics showed, with some key technologies ranking among the first in the world. Tian Lipu, former commissioner of the State Intellectual Property Office (SIPO), described China becoming an innovative country as "a revolution". "It will be a long and winding road to shift from imitating others to independent innovation," he said. "The good news is, however, efforts to be innovative have achieved results and there's a promising future ahead," Tian said.

China's patent applications surpassed the United States for the first time in 2011 with 525,000 recorded. The government accepted nearly 2.38 million applications and authorized over 1.31 million in 2013. The number of invention patent applications was 825,000, up 26.3 percent year on year. It is, however, far too early to celebrate such achievements. The nation's foundation of technological innovation is not solid and the capability for independent innovation is not strong. "Though China is a big patent country, it is not a strong one," said SIPO chief Shen Changyu. Compared with developed countries, China has fewer patents featuring originality, and high or core value, Shen said, adding that there are moves to improve quality and structure of patents. Innovation capability needs to be enhanced, because it still does not control key technology in core areas, he said.

(<http://www.ecns.cn/business/2014/06-20/119985.shtml>)



## 6. China Voice: Fear, ignorance behind calls to stem Confucius Institutes

(Xinhua, 23-06-2014)

The great Chinese sage Confucius might have pardoned the American Association of University Professors (AAUP) for their criticism of Confucius Institutes might come from either fear of other cultures or ignorance - or both.

In a recent statement, the AAUP called on universities to cease their cooperation with the institutes, saying the institutes are "ignoring" academic freedom. It claimed that Confucius Institutes function as an arm of the Chinese state and are pushing political agendas since they are sponsored by Hanban, a state office dealing with Chinese culture run by the Chinese government and the Communist Party of China (CPC). Such claims expose not so much communist propaganda as their own intolerance of exotic cultures and biased preconceived notions to smear and isolate the CPC. The shaping of traditional Chinese culture in the past thousands of years hardly has any direct relations with communism or its ideology, and those seeking to stem Confucius Institutes as disseminators of world culture are trying to hold back a pure form of human communication.

Since the first one was set up in Seoul, in the Republic of Korea, a decade ago, 440 Confucius Institutes and 646 Confucius Classrooms have opened across 120 countries and regions. More than 70 top 200 universities in the world have their own Confucius Institutes. How could such rapid expansion be possible if Confucius Institutes are propaganda outlets and threaten academic freedom? After all, these organizations are dedicated to the education and research of Chinese language and culture -- not unlike British Councils of the U.K., Germany's Goethe Institut and the Alliance Française from France. For the information of those accusing the Confucius Institutes of "having control of hiring staff, choosing the curriculum and restricting teaching materials," a management committee of such an institute consists of both Chinese and foreign experts and scholars, including many Western professors and university presidents, who have their say in decision-making.

As China gains fast economic development, its language and culture are also becoming more attractive and practical across the world. Both Chinese people and foreigners should have confidence in this culture - a unique contribution from this populous country to world peace. If Confucius were alive today, he might respond with his own saying: To feel no discomposure by those who don't know me, isn't that what is expected of a gentleman?

([http://news.xinhuanet.com/english/china/2014-06/24/c\\_133431220.htm](http://news.xinhuanet.com/english/china/2014-06/24/c_133431220.htm))



**(Collaborating Opportunities)**

**Swiss National Day Celebration –  
Switzerland in motion**

Date: August 1<sup>st</sup>

Place: Beijing

Contact: Embassy of Switzerland in China

**Swiss Universities Academic Expedition  
in China**

Date: fall 2014

Contact: Swissnex China

**Venture Leaders Program in China**

Date: September 3<sup>rd</sup> to 13<sup>th</sup>

Place: Beijing and Shanghai

Contact: Swissnex China

**Swiss academic delegation (for representatives of  
universities)**

Date: Oct 29<sup>th</sup> to 31<sup>st</sup>

Place: Shanghai

Contact: Swissnex China

**Swiss Universities Booth at China  
Education Expo**

Date: October 25<sup>th</sup> to 26<sup>th</sup>

Place: Beijing

Contact: Embassy of Switzerland in China

**CAS Grant for International Scientists**

<http://www.iiebeijing.org/cas/cas.html>

**Smart Energy: 4<sup>th</sup> National One-day  
Conference**

Date: September 5<sup>th</sup> 2014

Place: Domaine des Iles, Sion (Switzerland)

Contact: [www.theark.ch/smartenergy](http://www.theark.ch/smartenergy)