Science, Technology and Education News from China

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Introduction

This month's newsletter starts with an overview of Chinese leadership's plan to further develop basic research. In science, China starts testing projects for trains that run at 500 km an hour. The Ministry of Science and Technology launches development plan for bio tech industry. The National Space Administration releases its space plan for the next 5 years. In education, China's education spending in 2010 failed to reach the 4% goal again. As Chinese students registered for graduate admission examination, graduate schools face dilemma between efficiency and equality in selecting candidates. In health, WHO warns Chinese public of misleading tobacco industry research on low-tar cigarette.

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[1] Please click on the blue texts to activate the hyperlinks to either email addresses or related websites.

Policies

Chinese Leadership Calls for Further Advancement of Basic Research

2011 marks China's 3rd National Conference for Promotion of Basic Research, during which Chinese State Councillor LIU Yandong and Chinese Science Minister WAN Gang both called for further advancement of basic research through reforming funding management and creating a better environment for innovation.

The leadership has identified several areas in basic research to be further improved in the next steps, including expenditure, science funding and research culture.

China's R&D expenditure in 2010 has exceeded RMB 706 billion (USD 112 billion), reaching an all time high. But despite the large expenditure, R&D only accounts for 1.76% of the GDP, far behind the 2% goal set for the 11th Five Year Plan (2006-2010). Spending on basic research increased 20.1% to RMB 32.4 billion (USD 5 billion), but is still a small part—4.5% of the total R&D expenditure. The percentage remains unchanged since 2006 and the sources of funding come mostly from central government. In the coming years, the central government plans to expand sources of funding on basic research to local government, public institutions and private sector. Local government is perceived to be the main "growth point" in investment, as their spending on basic research will be included as part of the performance evaluation.

The Ministry of Science and Technology MoST also admits that basic research is a weak link in China's s&t development, particularly in terms of the originality of the research work and major breakthroughs in research areas. China looks to improve the situation by optimizing funding mechanism, promoting a more liberal research culture and fostering more talents.

The various funding programs, such as 973 program, 863 program and Natural Science Foundation NSFC program will remain competitive-based but focus on different areas. The mega-sized 973 and 863 grants will still follow top-down approach, indicating national priorities and goals and providing support to research teams. NSFC programs, which focus more on individual researchers, will be the main funding channel for curiosity-driven basic research. A new element will be added to the funding system, where stable funding will be offered to selective researchers, research teams and research bases to support their long term and curiosity-driven research. The priority areas for basic research remain the same as indicated in the previous s&t plans: protein research, quantum control research, nano-technology research, reproduction research, stem cell research and global change research.

In a speech made by Science Minister WAN Gang to outline the future work plan of MoST in the area of basic research, improving research culture is mentioned for the first time as one of the priorities. In a country characterized by hierarchy and respect of the seniors, questioning, challenging and debate between generations is always frowned-upon, leaving young researchers with little exposure in their early years of academic career. To create a more liberal research culture, research institutes, universities and research labs are now encouraged to pay more attention and give more opportunities to young researchers, encouraging them to proactively involve in research and supporting their work. The leadership also calls for a more transparent, credible research culture, which includes zero tolerance towards academic fraud, more transparency in the management of all funding programs and funding agencies, and an optimized evaluation system.

According to MoST, a *12th Year Plan for the Development of Basic Research* is to be released soon, providing a clearer roadmap for basic research between 2011 and 2015.

News

1. Chinese Test Train Runs at 500 km/hour

(MoST, 30-11-2011)

China made the debut of a novel speedy test train able to hit the cornerstone speed of 500 km or more an hour on 25 December 2011 at the compound of China South Locomotive in Qingdao. According to a briefing, the test train is applied with a newly developed high-power traction system with a traction capability up to 22,800 kilowatts. Built on the CRH380A model, the test train is designed with an enhanced capability for critical speed, towing capacity, and reduced resistance, along with improved system integration, head type, body, bogies, traction, and braking systems, striving for a safer and more reliable operation. Meanwhile, the proprietary key technologies developed to build the new high speed train have been industrialized.

The test train is also applied with a range of network technologies, including the Ethernet network, the Internet of things, and wireless network, allowing the test train to be well informed of the changes in environment and weather. The train driver can access to the needed weather elements as desired, including wind, rain, frost, snow, lightning, and earthquake in an automatic manner, and determine the speed of the train in line with the changing environment and weather elements for an enhanced safety.

(http://www.most.gov.cn/eng/newsletters/2011/201112/t20111231_91725.htm)

2. China Launches 12th Five Year Plan for Bio-tech Development

(MoST, 11-12-2011)

Chinese Ministry of Science and Technology recently publicized a biotech development plan for the 12th five-year period. The Plan says during the 12th five-year period （2011-2015）, China will see a noticeably enhanced biotech innovation capability that matches an internationally advanced level, and become a world leader in certain aspects. China has enjoyed in recent years a booming development of biotech industries, covering biomedicine, bio-agriculture, biomanufacturing, bioenergy, bioenvironmental protection among others. As a result, biotech industry has become a pillar sector supporting the development of national economy, making China a biotech power.

The Plan points out that China will foster world-class key laboratories, engineering research centers, research resources sharing platforms, and industrialization demonstration bases, through a range of supporting measures, strengthening visionary basic research activities in the areas of agriculture, population, health, and bioindustry. Efforts will be made to achieve technological breakthroughs in the areas of "omics", synthetic biology, bioinformatics, stem cells, regenerative medicine, genetic therapy, cellular therapy, molecular typing and individualized treatment, bio-chips, bio-imaging, bio-process engineering, bio-catalysis engineering, drug targets screening, drug design, plant and animal species design, biological safety among others. Efforts will also be made to develop major products and technical systems for biomedicine, bio-agriculture, biomanufacturing, bioenergy, and biological environmental protection.

(http://www.most.gov.cn/eng/newsletters/2011/201112/t20111213_91376.htm)

3. China Unveils Ambitious Plan to Explore Space

(New York Times, 29-12-2011)

The Chinese government on December 27 announced an ambitious five-year plan for space exploration that would move China closer to becoming a major rival at a time when the American program is in retreat.

Coupled with China's earlier vows to build a space station and put an astronaut on the moon, the plan conjured up memories of the cold-war-era space race between the United States and the Soviet Union. The United States, which has de-emphasized manned spaceflight in recent years, is now dependent on Russia for transporting its astronauts to the International Space Station. Russia, for its part, has suffered an embarrassing string of failed satellite launchings.

China has been looking for ways to exert its growing economic strength and to demonstrate that its technological mastery and scientific achievements can approach those of any global power. The plan calls for launching a space lab and collecting samples from the moon, all by 2016, along with a more powerful manned spaceship and space freighters.

In recent years, China has also sought to build a military capacity in keeping with its economic might, expanding its submarine fleet and, this year, testing its first aircraft carrier, a refurbished Soviet model. Under the new space plan, it would vastly expand its version of a Global Positioning System, which would have military as well as civilian uses. […]

For human spaceflight, the plan lays out a continuation of China's steady but unrushed efforts to develop technologies and extend its capacities. It says that China will begin the work to land its astronauts on the moon, but it does not provide a target date for when they will go. […]

Experts say Beijing is approaching its space program the way it did its military modernization. In addition to the aircraft carrier, which it bought from Ukraine, China has also made a progress on an anti-ship ballistic missile, which could be deployed to ward off foreign warships. Last January, the Chinese military tested a stealth fighter hours before Robert M. Gates, the defense secretary at the time, met in Beijing with President Hu Jintao.

(http://www.nytimes.com/2011/12/30/world/asia/china-unveils-ambitious-plan-to-explore-space.html?_r=1&ref=china)

4. Education Spending Short of Target

(Global Times, 29-12-2011)

The education minister announced on December 28 that spending on education accounts for 3.66 percent of China's GDP in 2010, below the target set nearly two decades ago, while experts said the goal would be difficult to reach.

The figure rose by 0.07 percent compared to 2009, Minister Yuan Guiren said at a conference held by the Ministry of Education (MOE) in Beijing. Planned spending on education this year is 14.6 percent more than the amount actually spent in 2010, according to Yuan.

As early as 1993, the Chinese government set a goal for spending on education to account for 4 percent of GDP by the end of the 20th century. In July last year, the central government and State Council reiterated that the target would be reached in 2012, according to China Economic Weekly.

In 2007, China's spending on education accounted for 3.22 percent of GDP. The figure was 3.48 percent in 2008 and 3.59 percent in 2009, according to statistics from the MOE."Judging from the rate of the increase, it will be difficult to realize the goal by that time," Xiong Bingqi, an education expert with the Shanghai Jiaotong University, told the Global Times.

China's education spending is lower than that of the world average and of some developed countries. According to a report released by the Organization for Economic Co-operation and Development (OECD) on June 14, OECD countries spent an average of around 4.6 percent of their GDP on education institutions in 2007.

Total spending on education ranged from above 5.5 percent of GDP in the Nordic countries to around 3 percent in Japan, Luxembourg and the Slovak Republic in that year. Denmark took first place with about 7 percent of GDP while the US spent about 4.8 percent, the report showed.

The proportion of China's fiscal revenue from GDP is lower than that of many foreign countries. China is a developing country that has many major challenges to face, a member from a national education reform

group said in August, when asked why China was unable to reach the goal, China News Service reported. However, education experts say China's government spending on education is far from enough. Without supervision from a national or local education funding committees, expenditure will depend on government officials' personal preferences, Xiong said.

"Education is a long-term investment that contributes less to GDP in the short term, therefore many officials want to invest more in infrastructure construction and highlight the economy rather than education, so that they can get more political credit quickly," Yuan Liansheng, a professor with Beijing Normal University, told the Global Times.The minister's report said that China has established a system for aiding students who face financial difficulties, and it covers students from preschool to graduate school. "Basically, we can ensure that no student loses out on education opportunities due to financial difficulties," Yuan Guiren said. But quite a few students drop out from school for various reasons, including financial problems, Xiong said. "Some parents are worried about the benefits of receiving higher education," he explained, adding that in some places a college graduate's salary is lower than a migrant worker's with less education.

(http://www.globaltimes.cn/NEWS/tabid/99/ID/690332/Education-spending-short-of-target.aspx)

5. **China's Postgraduate Recruiters Face Dilemma between Efficiency and Equality**

(*Xinhua,* 19-12-2011)

Chances for […] students from lesser-known universities to enter postgraduate programs are becoming fewer, as more elite universities and research institutes prefer to recruit postgrads through independent exams or interviews. Many of their recruits come from their own undergraduate student population or from other top universities.

These universities believe that independent recruitment is a more efficient way to find qualified students, while those in opposition have argued that it has reduced the chances for those who choose to enter the programs by taking the national postgraduate exam.

China has used a parallel system of postgraduate recruitment for decades, trying to strike a balance between offering equal opportunity for all candidates and prioritizing the most talented students. A postgraduate school can recruit students through both the uniform national exam and independent selection among recommended candidates. The latter usually takes up a smaller proportion.

Over the past few years, the percentage of postgraduate students enrolled through independent selection has notably increased at top-level universities.

About 45.8 percent of postgraduate students at Peking University in 2011 were recruited through independent selection, up from 39.9 percent in 2009.

"We've received very positive feedback from professors. They say students who are recruited through independent selection have relatively better performance and stronger academic capability," said Zeng Jiaoli, an admissions officer at Shanghai-based Fudan University.

However, the factors that come into play when it comes time to choose which students are qualified for independent selection have triggered controversy.

According to the Ministry of Education, only top-level universities can select independent selection candidates from their own undergraduates. These universities account for just 120 of the 856 universities that offer postgraduate programs nationwide.

Students from other universities, as well as those with working experience who wish to return to college, can only enter postgraduate programs through the national exam.

"If the universities go on increasing the quota for independent selection, fewer vacancies will be left to students like me," said Wang Meng, a student finishing her last year at a lower-ranking college in east China's Shandong province.

The increasing preference for independent selection has also revealed the weaknesses of the national postgraduate entrance exam.

The exam neglects discrepancies among universities, majors and students, resulting in exam-oriented education, said Lin Jie, an education expert at Beijing Normal University.

Education experts have suggested that the country should institute reforms for the national exam and tighten supervision over independent selection at major universities.

(http://news.xinhuanet.com/english/china/2011-12/14/c_131306621_2.htm)

6. WHO Warns Chinese Public of Misleading Tobacco Industry Research

(Xinhua, 19-12-2011)

Research indicating that some cigarettes are less harmful is tobacco industry hype meant to mislead the public, a World Health Organization official warned on December 19 as a heated debate rages in China over the credibility of tobacco science.

"Low-tar cigarettes, for example, don't reduce the harm at all," said Sarah England, a technical officer on tobacco control with the WHO Representative Office in China.

She said tar, nicotine and other smoke emission yields derived from smoking-machine testing do not provide valid estimates of human exposure and there is no conclusive epidemiological or scientific evidence that cigarettes with lower machine-generated smoke yields are less harmful.

The debate on tobacco science flared up in China after Xie Jianping, a researcher known for his studies on low-tar cigarettes, was honored with a seat in the elite Chinese Academy of Engineering earlier this month.

Xie's accreditation was challenged by Chinese health experts, but some scientists and smokers also came out to defend the 52-year-old researcher, who has spent decades working with a tobacco research institute under the China National Tobacco Corporation (China Tobacco) -- the world's largest cigarette company.

Neither Xie nor authorities with the Chinese Academy of Engineering have publicly commented since the controversy heated up.

"The marketing of cigarettes with stated tar and nicotine yields has resulted in the mistaken belief that those cigarettes are less harmful. It is just a tobacco industry tactic. It is very misleading," England said.

The WHO official compared low-tar cigarettes to a green bullet and cigarettes with standard tar levels to a red one, and said, "It is meaningless to say which is better, to be killed by a red or green bullet."

"I recommend not going near the bullets. Quit smoking instead," she added.

Yang Gonghuan, head of the China Tobacco Control Office under the Chinese Center for Disease Control and Prevention (China CDC), had previously blamed the tobacco companies' low-tar promotion strategy for the 41.15 percent growth in cigarette sales in China from 2000 to 2010.

China is the world's largest consumer of cigarettes. The country has 300 million smokers, and more than 740 million non-smokers are regularly exposed to second-hand smoke, according to experts' estimates. About 1.2 million people die each year in China from smoking-related illnesses ranging from lung cancer to heart disease.

China is a signatory of the World Health Organization-initiated tobacco control treaty, the Framework Convention on Tobacco Control (FCTC), but implementation has been slow mainly due to interference from the country's powerful tobacco industry, health experts have said. The FCTC requires nations to ban deceptive and misleading descriptions such as "low-tar" labels, they said.

Jonathan Samet, who chairs the Tobacco Products Scientific Advisory Committee of the U.S. Food and Drug Administration (FDA), told reporters in Beijing that he found Xie's accreditation unusual.

"No one has made a conventional cigarette product safer," Samet said. "A cigarette typically contains 7,000 dangerous chemicals and it is hard to say taking out one or two chemicals will make any difference."

(http://news.xinhuanet.com/english/health/2011-12/19/c_131315480.htm)

Events (January - February 2012)

January 2012

IEEE International Conference on Health Informatics
Date: January 5th
Place: Hong Kong, Shenzhen
Contact: http://bhi2012.embs.org

2012 International Conference on Innovation and Information Management
Date: January 7th to 8th
Place: Chengdu
Contact: http://www.iciim.org

2012 International Conference on Electrical Energy and Networks (ICEEN 2012)
Date: January 7th to 8th
Place: Chengdu
Contact: http://www.iceen.org

2012 International Conference on Information, Computing and Telecommunications
Date: January 7th to 8th
Place: Harbin
Contact: http://www.icict.net/main

2012 International Workshop on Image Processing and Optical Engineering
Date: January 8th to 9th
Place: Harbin
Contact: Harbin University of Science and Technology

The 13th International Symposium on Eco-materials Process and Design
Date: January 11th
Place: Guilin
Contact: Shanghai Institute of Ceramics, CAS

Asia Wind Power Congress 2012
Date: January 12th to 13th
Place: Shanghai
Contact:
http://www.broadersinc.com/apwc2012

Lecture Realize 2011 by Prof. Siegwart (ETHZ)
Date: January 14
Place: Shanghai/Tongji
Contact: http://www.swissnexchina.org

International Conference on Mechanic and Materials Research
Date: January 14th to 15th
Place: Dalian
Contact: http://www.icmmr.org

February 2012

The 1st Symposium on China's School Bus and International School Bus Expo
Date: February 2nd
Place: Beijing
Contact: China National Committee for the Wellbeing of the Youth

2nd Annual District Energy Asia Summit
Date: February 13th to 14th
Place: Beijing, China
Contact: http://www.districtenergyasia.com

Swissnex China Lecture
Andreas Goetz, Vice Director FOEN Swiss Federal Office of Environment, Head of Divisions Climate, Risk Prevention and Forest
Date: February 15th
Place: Shanghai
Contact:
www.swissnexchina.org

The 7th International Strawberry Symposium
Date: February 16th
Place: Beijing
Contact: Chinese Society for Horticultural Science, CAST

2012 International Conference on Traffic and Transportation Engineering
Date: February 17th to 18th
Place: Hong Kong
Contact: http://www.ictte.org/index.htm

2012 International Conference on System Modeling and Optimization
Date: February 17th to 18th
Place: Hong Kong
Contact: http://www.icsmo.org

Antibodies Asia 2012
Date: February 20th to 23rd
Place: Shanghai
Contact: http://www.antibodiesasia.com

Cell Line Development and Engineering Asia
Date: February 21st to 23rd
Place: Shanghai
Contact: http://www.celllineasia.com

Swissnex China New Year Gathering
Date: February 22nd
Place: Shanghai
Contact:
www.swissnexchina.org

2nd International Conference on Multiple Perspectives on Inclusion, Transition and Disability
Date: February 21st to 23rd
Place: Beijing
Contact: http://www.reachincorporated.com

2nd Annual Bio/Pharma Cold Chain China 2012
Date: February 27th to 29th
Place: Beijing
Contact:
http://www.pharmacoldchainchina.com

China (Guangzhou) International Professional Sound, Light and Music Exhibition
Date: February 29th
Place: Guangzhou
Contact: Department of Science and Technology of Guangdong Province