CHINA

More emphasis on universities in innovation drive

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Chinese Premier Li Keqiang was touring major universities in China last week to promote the country's strategy for science and innovation-fuelled economic growth under a new five-year plan announced last month that will triple funding for basic research by 2020. Li called on universities and research centres to collaborate more closely to build critical mass in the research sector. Chinese Premier Li Keqiang was touring major universities in China last week to promote the country's strategy for science and innovation-fuelled economic growth under a new five-year plan announced last month that will triple funding for basic research by 2020.

In his visits, which included the universities of Peking and Tsinghua in Beijing on 16 April, Li called on universities and research centres to collaborate more closely to build a body of research rather than wasting resources by duplicating and overlapping with one another.

The aim is to build critical mass in the research sector to enable a stream of high-end breakthroughs that can be commercialised.

China wants research to help transform the economy from low-end manufacturing to a more innovation-based economy that will put the country back on track for higher economic growth rates after a slow-down in the last two years.

An outline of the plan for 2016-20 was approved on 16 March by the National People's Congress or NPC, the appointed body which approves party policies.

"Innovation is the primary driving force for development, and must occupy a place in China's development strategy," Li told NPC delegates in March.

The plan builds on the previous five-year plan 2011-16 emphasising innovation. However, the universities' role will be greater under the latest plan, said Naubahar Sharif, associate professor of social science at Hong Kong University of Science and Technology, an expert on China's innovation policies.

"Until now there has been a huge focus on the technology side of the equation, a focus on making things, while much of the basic scientific knowledge that goes into making things hasn't been emphasised nearly as much," Sharif told *University World News*.

"The [leadership's] focus on universities is in order to reinforce their importance in this chain from ideas to development and commercialisation. It represents a shift back to knowledge creation – Chinese universities have not been sufficiently strong in this regard," he said, referring to the comparatively low positions of Chinese universities in international rankings which are weighted heavily towards research performance.

Basic research funds triple

Officials have said that the proportion of government funding for basic research will rise from 5% now to 10% of total research and development spending by 2020. If that goal is achieved, basic research spending could more than triple from US$10 billion last year to around US$34.5 billion (CNY224 billion) a year by 2020.

Details of the five-year plan have not yet been made public – rather it was presented to the NPC in the form of a shopping list of priorities, with some research areas mentioned including neuroscience, genetic research, cyber security, big data, cloud computing, clean energy, robotics, space, and a new Arctic observatory and Antarctic station. Most of these are already underway.

Some new policies have already been announced to improve conditions for universities undertaking research and innovation. China's State Council – roughly equivalent to the cabinet – headed by Li, announced in February that academics would be allowed more freedom to work on a part-time basis with firms to develop products.

The State Council also said research bodies and university departments transferring their work to outside firms to develop and bring to market should receive no less than half the net income earned from the product.

"It is important to speed up the transfer of scientific achievements, open a channel between science and the economy and quickly create a new productive force," the State Council said in an official statement on 17 February.

Too often researchers worry that their academic careers will be harmed if they work on commercial projects, experts said.

Limits of state-owned firms

The new focus on academic researcher and small research organisations is a recognition of the limits of huge state-owned enterprises which previously received the bulk of government research and development funding.

"There has been a reaction that hitherto much of the government's funding for science and technological projects has predominantly gone to the large state-owned enterprises, so these fat-cats have been given even more fat in the guise of funding for science and technological projects," said Sharif.

Yet despite huge funding, these behemoth companies have been unable to make major innovation breakthroughs in the past decade.

As part of the move against previous policies that favoured the big state-owned enterprises, China announced a pilot scheme last November to ease approval for new drugs and allow smaller research bodies to apply directly for approval in order to create more innovative domestic drug firms.

But the main bottleneck is transferring the technology from university research departments to firms, experts say.

Xiaoru Fei and Joseph Wong of the Munk School of Global Affairs, University of Toronto, Canada, said in a just-published research note on innovation in China's life sciences written for the National Bureau of Asian Research in Seattle, US, that Chinese universities are not lacking in star scientists who publish in first-rate academic journals. However, they lag significantly in technology transfer.

Although specific figures are not available in China, they estimated "technology transfer among China's universities equals less than 10% [of the] the rate of foreign universities".

They warned that in areas such as the life sciences other countries have struggled to

achieve success in large part because they equated investment capital and infrastructure with successful outcomes.

Benjamin Shobert, a co-author of the report said in a blog last week: “The painful reality is that success in the life sciences requires strong investment in more than just infrastructure coupled to a long time horizon.”

Is five years long enough?

Others believe five years will not be enough to see results in other areas than life sciences, which is known for long time frames.

In China, “five years from now the emphasis will still be on quantitative measures of progress – research publications, citations, patents and so on, but the real ground-breaking ideas and unsettling discoveries are still probably going to be elusive for China, and that’s going to take some more time", Sharif said.

“For the breaking of boundaries you need non-conformists, people who were truly willing to take up the challenge,” Sharif said.

Universities are still straitjacketed by Party control over governance.

In addition, stringent Internet restrictions within China have hampered data access for researchers.

“Growing constraints on public-data exploration and sharing are being felt throughout Chinese society. If not addressed, they will slow scientific research and innovation,” said Zheng Wan, a researcher at the Shanghai Maritime University in China in a recent article published in *Nature*.

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