Scientific Literacy : Sowing the Seeds of Self-reliance

Policy

By CHEN Chunyou

For many individuals, scientific literacy reflects their understanding of scientific concepts, phenomena and processes, which is also the foundation for a country to advance further and grow stronger.

Sci- tech innovation and science popularization are the two wings of innovative development. The coordinated development between science popularization and sci- tech innovation is good for the improvement of the scientific literacy of citizens.

To make science more popular in the new era, the *National Plan for the Popularization and Development of Science and Technology During the 14th Five-Year Plan Period* was released by the Ministry of Science and Technology and two other departments on August 16.

By 2020, the proportion of citizens with scientific literacy in China had reached 10.56 percent, thanks to a series of science outreach programs achieving the goal of over 10 percent set during the 13th Five-Year Plan period.

According to the plan, more than 15 percent of citizens will be science literate by 2025. Meanwhile, besides the funding support from government, a more diversified investment mechanism is expected to be established, which encourages enterprises, social organizations and individuals to contribute their share.

Children learn the knowledge of aerospace science and technology at an artificial intelligence experience center in Weifang, Shandong province. (PHOTO: VCG)

There were 1,525 sci-tech museums nationwide in 2020, an increase of 21.2 percent over 2015. In this plan, the establishment of science popularization bases with regional, industrial, and disciplinary characteristics is supported, and a number of national educational bases will be created to enlarge the infrastructure coverage.

The plan said that research institutes should motivate the enthusiasm of researchers and scientists to participate in science popularization through policy guidance, financial support and assessment. It also calls for promoting the spirit of scientists, and cultivating a fashion of advocating science and encouraging innovation across society.

Moreover, the research institutes are expected to promote the popularization of sci-tech innovation resources, focus on frontier research fields to carry out targeted science popularization, and give full play to the role of science popularization in advancing the commercialization of sci-tech achievements.

Notably, rural areas feature prominently in this plan. Specialists and experts in culture and science will be dispatched regularly to the rural areas to share their experience with farmers and help them to live and do business in a scientific way.

With regards to such common challenges faced by humankind as food security, energy security, human health, disaster risks, climate change and environmental protection, China will plan and organize international activities to enhance global consensus on country-level cooperation.

In addition, non- governmental exchanges are to be expanded. The universities, social organizations and enterprises are encouraged to participate in this move. Science popularization products catering to global tastes will be developed and promoted worldwide, and the introduction of renowned international science popularization works is also welcomed, said the plan.

More Policy Bonuses Rolled Out for Young Researchers

By LI Linxu

More opportunities and less burden are in the cards for young researchers, according to a notification jointly released by five government bodies including the Ministry of Science and Technology this month.

The notification is one of the latest moves to support young researchers and motivate their innovation abilities.

Wu Enxiu is one of beneficiaries of such moves. When he earned his PhD last July, the deadline to apply for the Young Scientist Fund under the National Natural Science Foundation of China had already passed.

Without fund support, his research couldn't go on. Fortunately, he landed projects from an innovation fund at his university and an open fund at his lab.

Thanks to the support, he has become an associate research fellow at Tianjin University.

With the new measures rolled out in the notification, more and more young researchers are expected to achieve their R&D goals.

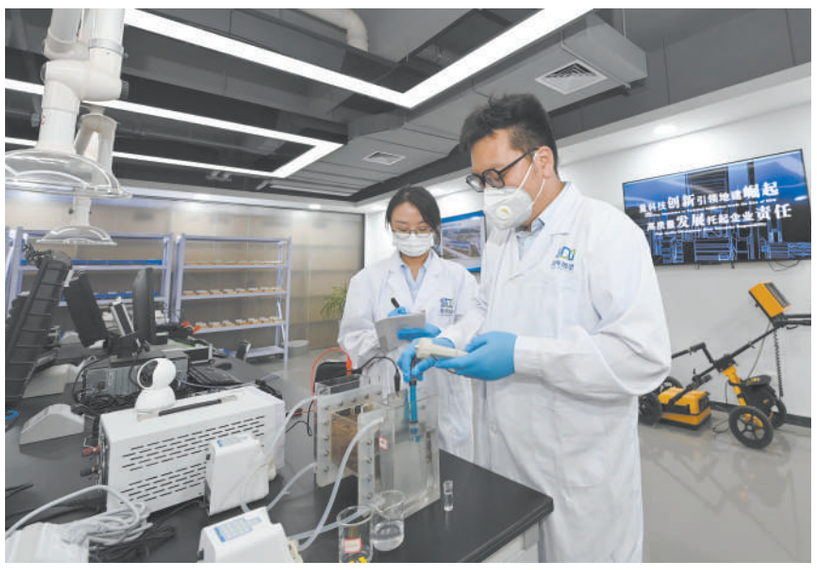
The notification puts forward a series of special campaigns and support measures, such as uplifting the proportion of young talent in research projects, particularly in key projects and national projects, increasing R&D opportunities for them, reducing relevant evaluation and assessment requirements, and ensuring they have enough R&D time.

The proportion of young researchers who undertake leading or key roles in national R&D programs will be elevated to 20 percent, according to the notification.

Focusing on young talent in the field of basic sciences, special pilot programs will also be carried out.

Universities, research institutes and relative units are urged to evaluate young researchers based on their contributions, instead of only valuing the number of papers they publish.

In recent years, young researchers have played an increasingly important role in sci-tech innovation. Official statistics show that those aged 39 or under account for 78 percent of human resources in science and technology.



A series of policies have been rolled out recently to provide more opportunities to young researchers and reduce their burdens. Photo shows young researchers are doing experiment on electrokinetic remediation of soil in Xixian New Area, Shaanxi province. (PHOTO: XINHUA)

Active Support for Seed Industry Enterprises

By GONG Qian

Seed industry innovation is high on agenda for China's 14th Five-Year Plan (2021-2025), as the country is dedicated to meeting challenges in agricultural technology and accelerating agricultural and rural modernization.

To achieve self- reliance in seed technology and ensure that its germplasm resources are independent and controllable, a notification was released by the Ministry of Agriculture and Rural Affairs (MARA) early in August.

It is also vital to enhance the international competitiveness of the seed industry. In recent years, China's seed industry has witnessed rapid development, having two of the top 10 crop seed enterprises in the world listed.

Therefore, it is crucial to develop a cluster of leading seed industry enterprises, so as to realize China's transformation to a country strong in the seed industry, said the notification.

A total of 276 seed industry enterprises and organizations have been selected from over 30,000 candidates, to provide support to grow the country's seed sector, including 69 crop seed companies, 86 domestic animal and fowl genetic resource companies and 121 centered on aquatic germplasm resources, according to the notification.

Based on their scientific research capacity, asset strength, market scale and development potential, the selected group can be divided into three categories.

The first are enterprises that can "solve difficult problems," focusing on imported germplasm resources. They are expected to cultivate new varieties with independent intellectual property rights.

For example, to reduce dependence on imported white feather broilers, three leading enterprises were selected to improve their performance in independently breeding broilers, thus achieving the goal of self-reliance in five to 10 years, said an official from MARA.

The second category is to "shore up weakness," focusing on germplasm resources that are lagging behind those at advanced international level. The enterprises shall narrow the gap in many aspects, such as variety production and quality.

In regard to ensuring the supply of other grain and major agricultural products, 32 selected enterprises will center on crops including corn, soybean, cotton, oilseed rape and tubers, improving their quality to catch up with their international counterparts, said the MARA official.

The last category is to reinforce the country's advantage over its competitive germplasm resources, accelerating the application of modern breeding technology.

For example, 19 selected enterprises will concentrate on two major food crops: rice and wheat, speeding up cultivating a batch of breeding materials and making new breakthrough while enhancing the level of yield and quality. The move can ensure absolute food security and support germplasm resources.

In the future, local agricultural authorities will make joint efforts to help the chosen enterprises solve their problems, introduce preferential policies for their development and crack down on illegal activities that infringe on their intellectual property rights, said the notification.

Technology Takes Gansu's Agriculture Industry to Next Level

Case Study

By XIE Manbin and ZHONG Jianli

August is a fruitful season for northwest China's Gansu province, where the development of the agriculture industry is thriving.

In the past 10 years, Gansu has fully employed modern technology, tapped the potential of its resources, and developed a modern agriculture that can cope with cold and drought, which has played a major role in lifting the province out of poverty.

A potato planting field in Dingxi, Gansu province. (PHOTO: VCG)

Potatoes, the "golden eggs"

By optimizing the modern seed potato production system of "basic seedlings — virus- free seedlings — virus-free original seed (basic seed) — original seed — first-class seed," Gansu Ailan Potato Seed Industry Co., Ltd. continues to expand the industrial chain, improve the seed potato production infrastructure and increase its production capacity.

The company's development is indispensable to its cooperation with related research institutions, including the Potato Research Institute of Gansu Academy of Agricultural Sciences.

The Institute, together with a number of organizations, implemented the project of "Mechanized Production Demonstration of New Staple Food Varieties of Potatoes in Anding District."

Wen Guohong, a researcher at the Institute, introduced that this potato project highlighted the application of supporting technology for new staple food varieties called Longshu No.7 and Longshu No.10. The demonstration and promotion of the varieties was completed in 2016, with a planting area of 16, 798 mu (1120 hectares). The average yield is 2,241.8 kilograms of potatoes per mu, which helped increase farmers' income by 10.78 million RMB.

At present, Gansu has developed into an important seed potato base, commodity potato base and processing base in the country. In 2021, Gansu's potato planting area and output reached 10.2 million mu (680,000 hectares) and 15 million tons respectively, ranking among the top tier in the country.

Seed corn in Hexi Corridor

In the northwest of Gansu, there is a long and narrow flat land called Hexi Corridor, where the seed industry is well- developed. The corn seeds produced here can meet more than half of the country's needs.

"Corn will still be one of the main food crops in China in the future," said Hou Suiwen, dean of the School of Life Sciences of Lanzhou University, adding that producers and the market will need the most resistant and widely suitable, medium and early maturing, and high and stable yielding varieties. He believes that to solve these problems, the improvement of the quality and efficiency of corn germplasm is imminent.

After years of R&D, his team has established a new way of precise molecular breeding of corn, created new germplasm resources, and solved the technical problems of grain crop breeding in Gansu.

With this technical support, corn breeding and seed production in Gansu is developing optimally. In 2021, the corn seed production area reached 1.41 million mu (94,000 hectares), producing 579 million kilograms of seeds, which accounted for 57.8 percent of the country's total corn seed output.

It is expected by 2025, that the output value of the entire industrial chain of corn breeding and seed production in Gansu should reach more than 12 billion RMB.

Demo Application Scenarios for AI Poised to Make a Splash

By LI Linxu

A batch of replicable experience is being developed to promote the application of AI.

Ten demonstration application scenarios for AI were recently highlighted by the Ministry of Science and Technology (MOST).

Smart application scenarios in farming, mining, ports, factories, education and supply chains are top of the list.

Innovation in these application scenarios will receive corresponding support, according to MOST, vowing to strengthen the coordination of upstream and downstream R&D, as well as the integration of new technologies.

It is a follow up policy to the *Guiding Opinions on Accelerating AI Application Scenario Innovation* released this month by six government bodies, including MOST.

Aiming to address major application and industrialization issues, the guiding opinions laid out goals, tasks and measures to promote scenario innovation and spur high- quality development of AI.

Enterprises are urged to play a leading role in application scenario innovation, said the policy, calling for forming a synergy among industry, university and research.

AI, an emerging technology with great promise, is developing very fast in China. It has been applied in a wide variety of fields, ranging from smart manufacturing to new drug R&D.

Official statistics show that in 2021, the scale of the country's core AI industry surpassed 400 billion RMB, with the number of AI enterprises exceeding 3,000.

By 2030, AI could transform transportation and other key sectors in China, adding significant economic value, predicts McKinsey, a multinational consulting firm.

This month, driverless robotaxi service was launched in designated areas of Wuhan and Chongqing, marking a significant step in the country's commercialization of autonomous driving.

As a frontier area of AI technologies, autonomous driving is also among the list of ten demonstration application scenarios for AI selected by MOST.

China is striving to be on par with world-leading levels of AI technologies and applications by 2030, according the *New Generation AI Development Plan* released by the State Council in 2017.