

Grooming climbers to scale R&D peaks

This is an edited excerpt from a speech by Education Minister Ng Eng Hen at the 2nd World Conference on Research Integrity yesterday.

THE journey for Singapore to venture into research and development was not an intuitive one 45 years ago at our founding. Our forays into this field were as much a response to competition as it was a default choice when looking at limited options for our economic strategy.

As we lacked natural resources and could not compete on size, we needed to leverage on science and technology to amplify our strengths and extend our reach. This explains why barely two years after Singapore gained independence, we created a Science Council to advise the Government on matters relating to science and technology.

In 1991, the Government launched the first National Science and Technology

Five-Year Plan, which established the National Science and Technology Board, the successor to the Science Council. This board was later reorganised to become the Agency for Science, Technology and Research, or A*Star, in 2001.

Our evolution to an innovation-driven economy was driven in part by neighbouring countries' access to cheaper factors of production, like land, labour and energy. Will Singapore succeed in this next lap where more is required of our human capital, and as our competitive edge in traditional industries is being eroded?

Much of our economic progress depends on it. But we have to be proactive.

We have strong fundamentals in place. First, we have achieved high standards in maths and science among students, as shown in international comparisons such as the Trends in International Mathematics and Science Study.

More than 97 per cent of our Grade 12 students offer mathematics and 86 per cent offer at least one science subject. This compares with about 15 per cent in Britain for science. In America, it is just as low.

Part of the strategy to embed learning of Stem - science, technology, engineering and maths - in our culture is to stretch our ablest, helping our top stu-

dents take part in the various International Science and Maths Olympiads and events such as the Intel International Science and Engineering Fair.

These initiatives have persuaded more than half of our students to pursue a sci-

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ence and technology degree at our universities, above the Organisation for Economic Cooperation and Development average of 25 per cent.

These efforts need to be maintained. With economic prosperity and political stability, students will turn to subjects

which they find intrinsically motivating and would lead to careers in finance and commercial sectors which offer higher monetary rewards.

To build expert mountain climbers in R&D, Singapore will also have to build R&D peaks, not just more petrochemical islands, airports or seaports.

Over the last four years, five Research Centres of Excellence have been established within the National University of Singapore and the Nanyang Technological University, with topics ranging from quantum physics to mechanobiology.

We are thankful to have attracted leading experts in these fields of study, who will help us develop a broad and deep spread of scientific talent here.

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This wider economic strategy aimed at transforming Singapore into a knowledge-driven economy is driven at the highest levels through the Research, Innovation and Enterprise Council or RIEC, chaired by the Prime Minister.

Needless to say, R&D is an expensive

investment with long timelines. In 1991, Singapore's gross expenditure in R&D, or GERD, was just half a billion dollars, less than 1 per cent of Singapore's GDP then. We had only 28 research scientists and engineers per 10,000 labour force. Today, our GERD at \$7 billion annually is almost 3 per cent of GDP. Nearly 1 per cent of Singapore's workforce, or 26,000, are research scientists and engineers.

As with most long-term ventures, early harvests sustain both morale and commitment. Thankfully, we have a few.

In electronics, we are one of the world's leading manufacturing sites for research tools and diagnostics instruments. In clean technology, or cleantech, many global players have recognised the research potential at our universities, and have set up corporate labs at their campuses, such as GE Water and Bosch. The cleantech industry in Singapore is expected to generate \$3.4 billion a year in value-add and employ 18,000 people by 2015. Singapore is also making headway in biomedical science.

Singapore is a relative newcomer in this high-stakes game. Competitors with much larger economies are not standing still. The Obama administration has pledged to devote more than 3 per cent of America's GDP to R&D. South Korea is aiming for 5 per cent. France is spending €4.4 billion (S\$7.8 billion) on a new "super university" to rival the top universities of today.

But this race is virtuous and Singapore will form more linkages for international collaboration and cooperation.