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S'pore's science and engineering talent crunch

By Ivan Png

THE government's long-term economic development strategy aims for the manufacturing sector to contribute a quarter of the gross domestic product (GDP). Presently, its contribution is a healthy 28 per cent. To sustain future growth, our manufacturing sector must increase productivity. China, Vietnam and other countries can offer lower wages. Singapore can be competitive only by climbing the technology ladder.

Our manufacturing must become more technology-intensive or capital-intensive, or both. Shell Eastern's new petrochemical complex will cost several billion US dollars but employ just 200 people. Genentech recently broke ground on a biological manufacturing facility in the Tuas Biomedical Park. The plant will cost US\$140 million (S\$213 million) and employ only 100. The same is true of semiconductor plants. These facilities cost hundreds of millions of dollars and employ relatively few but highly skilled people.

Where do these scientists and engineers come from? In order to sustain the continued growth of the manufacturing sector, the government allocates 40 per cent of places in the universities and polytechnics to science and engineering.

But this solid-looking percentage masks two worrying trends. One is that science and engineering programmes may not attract the best or even the better students.

This is not a new problem. Historically, many students who specialised in science at A levels applied to study medicine at university. The government responded by diverting the best applicants from medical studies. However, with a much more affluent society, such dirigiste methods are losing their effectiveness. Those whom the National University of Singapore (NUS) turns away pursue their dream in Australia, Britain and elsewhere.

Today, the problem has exacerbated. Many of our young people, like those in the United States and Europe, aspire to careers in business and law. For instance, 95 per cent of students admitted to the NUS business school qualified for science, engineering or computing. Even more staggering is that the proportion was 90 per cent among those admitted to the NUS law faculty.

The second worrying trend is that even people trained in science and engineering do not pursue careers in those fields. For example, one of this year's NUS information systems graduates joined an investment bank in Hong

Kong, where he will earn US\$60,000 to provide technical advice on the trading floor.

Last year, the proportion of NUS engineering graduates reporting that their first job was not related to their studies ranged from 54.2 per cent (bio-engineering) to 19.2 per cent (computer engineering).

The government benchmarks ministerial salaries to the medians of the top eight earners in six professions - bankers, lawyers, accountants, engineers and top executives in multinational corporations and local manufacturers. Which professions get the highest and lowest incomes? Lawyers at \$4.29 million and engineers at \$620,000, respectively.

MP Lee Bee Wah has observed that many ministers, senior civil servants and CEOs have received education in engineering. Indeed, a recent survey by the Business Times highlighted that there are many highly paid executives in listed companies with an engineering degree.

Yes, engineering provides an excellent education in problem-driven or solution-oriented analysis and decision-making. This foundation is certainly valuable in a complex world. But, surely, the primary objective of science and engineering education is to prepare graduates for research and development (R&D) and the manufacturing sectors?

Without a sufficient base of Singaporean scientists and engineers, our R&D and manufacturing sectors will be dependent on foreign talent. The government is rightly working hard to attract foreign talent.

However, foreign talents, and even our own science and engineering talents, are footloose. One of the early software engineers to join Google was Tan Chade-Meng, a Nanyang Technological University graduate. Google continues to recruit from Singapore.

Presumably, we count on manufacturing as it involves large sunk costs - like the several billion US dollars that Shell is investing in its petrochemical complex. These sunk costs help to root investors in Singapore. But if the scientists and engineers can easily fly away, what will be rooted in Singapore is just an empty shell.

We must make careers in science and engineering sufficiently compelling for our own young people. If we cannot, should we revisit the justification for the manufacturing share of the economy?

The writer is a professor of information systems, business policy and economics at the National University of Singapore. The opinions expressed here are his own.

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