

Training Engineers

By Shinji Fujino

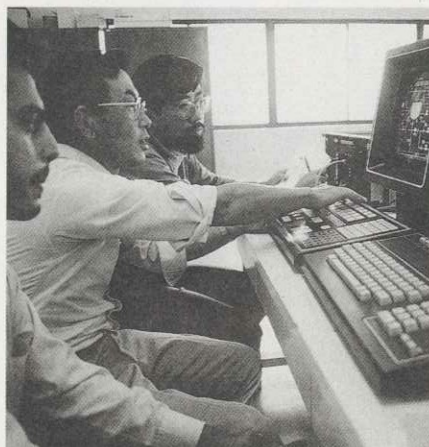
The Asia-Pacific region has achieved the most notable economic growth of any region in the world. Many countries in the region, notably the NIEs and ASEAN countries, have achieved this growth through expansion of exports buoyed by vigorous foreign investment. They owe their growth in great measure to exports of industrial products manufactured with labor-intensive technology. Their growth is astonishing as far as statistics are concerned, but some analysts believe these countries may not prove to have enduring competitive power.

The experiences of Japan and South Korea show that huge investments will not necessarily increase productivity and could even lower economic efficiency unless there is an increase in the number of engineers and skilled workers. Mere introduction of labor-intensive technology and rationalization through mechanization will not help.

Moreover, many of the industries in these countries have grown into what they are today thanks to technologies imported from industrially advanced countries. Because the products manufactured in these countries are copied from those made in advanced countries, they have few strategic advantages except the low prices made possible by their lower labor costs. The technology gap between them and the advanced countries just keeps widening.

In order to acquire enduring competitiveness, therefore, it is essential to train middle-level industrial engineers, skilled workers and basic researchers. At present, however, the shortage of people in this category is becoming acute.

In ASEAN countries, excluding Singapore, the number of students advancing to higher educational institutions has doubled in the past 10 years, but most of them are concentrated in fields other than science and technology. In Thailand, in particular, only 2% of university students are enrolled in engineering departments. The annual number of engi-



Malaysians receive vocational training from JICA, the Japan International Cooperation Agency.

neering graduates is only 2,500 against industry's need for 6,000. Thailand had only 55 engineers for every one million people in 1988. Compared with Japan, which has 740 per million, and South Korea with 680, Thailand has a great shortage of engineers.

In order to produce more industrial engineers, various courses to educate and train researchers and technical engineers are being provided within and outside the region, mainly with assistance from industrially advanced countries.

International school

Japan, for instance, extends grants to the Asian Institute of Technology (AIT), a higher educational institution in Thailand, and dispatches teachers and instructors. The Japan International Cooperation Agency, an affiliate of the Japanese government, as well as various private training institutions are training Asian middle-level engineers in Japan.

AIT was established in 1967 with funds raised by Japan, the United States, Australia, New Zealand, South Korea and Taiwan. The Thai government provided land for the institute. AIT is an international graduate school which offers



In Indonesia, JICA activities extend to veterinary treatment.

courses centering on civil engineering such as structural engineering and computer engineering.

Enrolled at AIT are about 600 students from more than 20 countries of Asia. It has turned out about 3,300 graduates during the 20 years of its existence. There is a staff of about 100 teachers who come from Asia, Europe, North America and Oceania, an area much wider than that from which students have come. More than 90% of the graduates remain and work in the region.

Many of the early graduates now hold responsible positions which are the key to the development and prosperity of the countries in this region. Though AIT is an engineering graduate school, its graduates have become state ministers, senior officials of government agencies and public corporations, or presidents or faculty deans of universities.

Because AIT is a school for students from a variety of countries run with multinational assistance, various problems have arisen.

The countries which assist it have differing views on the management and content of the education it should provide. Some people think that AIT should take into consideration the characteristics



A log transportation operation in Thailand receiving assistance from JICA



A Japanese instructor (white shirt) with Philippine construction workers

of the Asian region and provide education and research on technology actually needed in the region. Others think that AIT should attach importance to basic matters of learning and education which remain constant despite changes in the times and development of the region and should give people training that will enable them to cope flexibly with problems that might arise in the future due to changing social conditions.

To its teachers, who are dispatched from many countries, AIT is only a temporary workplace and they are always concerned about how their performances at AIT will be rated on their return home. Naturally, their opinions on the content and level of education tend to differ.

Although the amount of assistance has been increasing, the increase is not necessarily proportionate to the increase in research expenses, education expenses and scholarship grants. The assistance has been dwindling in relation to the increase in these expenses. It is feared that it will become difficult to secure teaching staff, particularly young teachers, and that the very existence of AIT as a higher educational institution is being threatened.

Despite these problems, AIT has produced prominent people who hold important positions in the region's community. In this respect, AIT can be said to have made a sufficient contribution to the progress of the region. In order that AIT will not remain as a mere regional higher educational institution, and that it will educate and train distinguished people capable of making outstanding contributions to the world as a whole, and eventually develop the region's competitive

edge over countries outside and raise its relative position in the world, AIT must resolve the various problems it is facing today.

Diverse requests

Another training institution that is producing significant results, the Association for Overseas Technical Scholarship (AOTS), was established in 1959 as Japan's first private technical cooperation organization. It offers training courses on industrial technologies concerning such fields as electrical appliances, machinery, automobiles and chemicals, in addition to training courses in business management and production control. It also arranges lectures and on-the-job training at firms and factories. Trainees come from all over the world. During the 30 years since its establishment, AOTS has produced about 37,700 graduates.

AOTS aims at giving trainees capability in technologies owned by Japanese private companies. It is designed to train middle-level engineers and business managers of developing countries. The idea is that after going back to their respective countries, AOTS trainees will help foster and develop industries there by putting to use the technological knowledge they have gained. AOTS graduates have formed alumni associations in their respective countries and are contributing to enhancing the effects of education and training at AOTS by exchanging information and recommending trainee candidates to AOTS after they return home.

AOTS has made significant achievements by transferring technologies in va-

rious fields to numerous countries and enjoys a high reputation abroad. As a result of the diversity of requests from developing countries, however, AOTS faces some problems.

Although its budget has been increased year after year, AOTS still finds it difficult to accommodate all the trainees who apply to it, because requests from developing countries have increased sharply. Recently, AOTS has been having to turn down about half of the applications it receives.

AOTS provides uniform training to students from countries in different stages of industrial development, and cannot provide individually tailored training to meet the needs of a particular country.

Because AOTS does not provide an adequate follow-up service to its trainees after they return home to update what they have learned, technologies acquired by trainees at AOTS are not necessarily transferred effectively to their home countries. When problems arise which were not covered in their training, or when they want to improve on the technologies they have acquired, they often do not know what to do.

In order to address these problems, AOTS should conduct in developing countries the same training that it provides at present in Japan. Taking into account travel expenses, living expenses and personnel costs, for the same budget as is used in Japan, training could be provided more efficiently in the developing countries. If training were provided in the developing countries, needs of each country could be properly met and the follow-up training could also be provided.

At present, AOTS does provide some training in developing countries, but it is necessary to improve the local training both in quality and quantity. A conceivable way to start doing this is to use the alumni associations as the core body, transfer training know-how to them, and develop local training centers.

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