



The Malaysia-Japan International Institute of Technology (MJIT) in Kuala Lumpur  
Photo: Courtesy of JICA

# Japanese-style Engineering Education Around the World

The engineering education that supported Japanese economic development is now contributing to human resources development all over the world.

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**D**URING especially the Meiji period (1868-1912), Japan invited engineers and other experts from abroad and introduced Western technologies, modernizing itself in the process. Engineering education was one factor that supported Japan's modernization. After the establishment of the precursor of the current Faculty of Engineering of the University of Tokyo in 1871, engineering-based higher education institutes were founded across the country. Researchers and engineers working in universities and private companies were nurtured and have supported Japanese development ever since.

Utilizing this experience, Japan has begun various supports, starting with the establishment of the Egypt-Japan University of Science and Technology in 2010 and has provided educational support around the world ever since, notably establishing and managing higher education institutes practicing the Japanese-style engineering education that Japan has developed.

It is in ASEAN countries where Japan has most rapidly stepped up cooperation in recent years. For example, in 2011, in response to a request from the Malaysian government for cooperation, the Malaysia-Japan International Institute of Technology (MJIT) opened in Kuala Lumpur, the capital city of Malaysia, as a Japanese-style engineering

education institute under the umbrella of University of Technology Malaysia. Malaysia is shifting from the assembly and processing industry that drove economic growth to added value-oriented industries, such as product design and R&D. MJIT is expected to play an important role in this effort.

According to Yoshiko Miura, Senior Deputy Director of the Technical and Higher Education Team at the Japan International Cooperation Agency (JICA), "Malaysian industry needs people who can conduct planning and design in accordance with the needs of manufacturing. For example, there is a need for engineers who can design the assembly line of highly productive factories. Nurturing these human resources is one of MJIT's important missions."

Currently, at MJIT, more than 1,200 students are studying at the undergraduate courses and graduate schools of mechanical precision engineering, electronic system engineering and so on. There are eighty-two faculty members, thirteen of whom are Japanese. Twenty-seven Japanese universities, two research institutes, the Ministry of Foreign Affairs of Japan, the Ministry of Education, Culture, Sports, Science and Technology, the Ministry of Economy, Trade and Industry, the Japan Chamber of Commerce and Industry and JICA have organized a consortium and cooperate in dispatching teachers to MJIT, undertaking joint research, enabling student

exchange activities, providing joint supervision for students and offering scholarships for students from ASEAN through JAIF (Japan-ASEAN Integration Fund). Through its yen loan and technical cooperation, JICA provides support for the procurement of MJIT's educational and research equipment and collaboration among universities and with industrial circles.

In addition, MJIT is characterized by a research and education system called Innovative Kohza (i-Kohza). Kohza is a laboratory that constitutes the core of Japanese engineering education. Engineering education conducted by Western universities is centered on course work and individual instruction. But in Japan, professors at the top of the laboratories, researchers with a doctoral degree, graduate school students and university students are members of laboratories, each of which conducts specialized research and education. MJIT provides nineteen i-Kohzas, including "advanced devices and materials engineering," "chemical energy conversion and application" and "Takasago Thermal / Environment Systems Laboratory" (a course funded by Takasago Thermal Engineering Co., Ltd.).

Miura says, "Students who participate in i-Kohza can acquire research know-how from senior students as well as professors. Students can also develop teamwork and communication abilities through group research."

MJIT is expanding the scope of its educational and research fields in cooperation with the consortium's member universities. For example, Yamaguchi University (YU), a member of the consortium, established the YU-MJIT Innovation Management Research Lab as an international joint intellectual property laboratory in 2016, which has introduced world-class data infrastructure. Its aim is to develop human resources for Malaysian intellectual property and to make MJIT a center for intellectual property research in Southeast Asia.

In addition, after a major water-related disaster hit Malaysia in 2014, the Disaster Preparedness and Prevention Center was established within MJIT for the purpose of developing human resources and

conducting research related to disaster prevention. In cooperation with member universities of the consortium, such as the University of Tsukuba and Kyoto University, the Center launched Malaysia's first master's course on disaster risk management for public administrators in September 2016.

Moreover, at Vietnam Japan University (VJU), which opened in Hanoi, Vietnam, in 2016, JICA supports the establishment of the new model university as a new Vietnamese Center of Excellence with Japanese qualities that have been adjusted to the needs of Vietnam. VJU offers interdisciplinary programs covering many fields of social science and natural science, all residing under the overall domain of sustainable science, and gives students a wide perspective. Japanese universities provide support for drawing up curricula and educational and research activities helping VJU provide high quality programs, building on Japanese-style engineering education. In addition, in 2003 after the preparation stage, JICA launched the project of ASEAN University Network/Southeast Asia Engineering Education Development Network (AUN/SEED-Net). Currently, they are promoting joint research among fourteen Japanese support universities and twenty-six universities in ASEAN countries, along with the acquisition of degrees and the dispatch of faculty members.

According to Miura, "They are committed to improving the educational and research abilities of each university by strengthening networks among universities through the project. They also tackle issues that are common with ASEAN countries, such as environmental pollution, climate change and natural disasters."

Japanese-style engineering education has supported economic growth and has promoted the development of cutting-edge technologies. It also contributes to overcoming pollution issues that have emerged as a side effect of growth and continues to contribute to solving other issues, including disaster prevention. Such expertise is expected to be shared among not only ASEAN countries that continue to develop but also with other countries all over the world. **■**