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## Engineering Technology: New International Role

In three decades of assistance to education in less developed countries (LDC's), the United States has exported with varying effectiveness models of science-based engineering curricula. These efforts have created a few national centers of excellence in advanced engineering education, which are oriented by and large to solving the problems of the modern industrial sector and are sustained by disproportionately large investments by national ministries of education. The "scientist engineers" produced by these elite centers migrate to and perform well in overseas universities, but only a small percentage of them return home. At the other extreme of the technical manpower spectrum, many LDC's have an improved local capacity for training skilled and semiskilled workers for industrial employment. International development banks, foundations, and bilateral programs of the Agency for International Development have contributed to these efforts.

Much greater national efforts are still needed to improve the training of skilled workers for agriculture and industry in the LDC's. Manpower studies in the LDC's repeatedly point to the relative abundance—in fact, oversupply—of engineers and to the shortage of middle-level engineering and industrial technicians. They also show a pattern of distribution of these high-level human resources that is detrimental to regional and especially rural development. Urgently needed are middle-level engineering and industrial technicians who are able to implement and manage the more sophisticated technological systems now entering or being developed by countries that are rapidly becoming industrialized.

During the same 30-year period, profound changes have taken place in technological education in the developed countries, especially the United States. The technician was rediscovered in the United States in the late 1940's. Since then, programs for the training of engineering and industrial technicians with different levels of skills and knowledge have been developed in various institutional and organizational settings. When properly paired to the needs of LDC's in different stages of development, they will be able to respond to these needs. Their distinguishing characteristic is the emphasis placed on technical problem-solving and hands-on experience with the tools of modern industry.

More than 700 U.S. institutions are engaged in these programs. The outstanding ones are the 89 2-year technical colleges, accredited by the Engineers' Council for Professional Development, which offer associate degrees in engineering technology and industrial technology. Also accredited are another 30 colleges offering associate and bachelor's degrees and 35 colleges offering only a bachelor of science in technology.

Other institutions include community and junior colleges, technical institutes, and some universities and secondary-level schools offering post-secondary advanced technical programs. Until now, colleges and institutes of engineering technology have been used only sporadically in U.S. bilateral assistance activities. These institutions, especially those with experience in international work, are now considering how to pool their resources. They have the capacity and maturity to speak to LDC's that are demanding the sharing of technological resources. Such requests and demands are likely to come up at the 1979 U.N. Conference on Science and Technology for Development in Vienna.

It is essential that international policy-makers bring these resources to the attention of LDC's. High priority should be given to their development under new organizational initiatives supported by the proposed U.S. Foundation for International Technological Cooperation. This opportunity to match these appropriate resources with evident needs should not be missed.—LAWRENCE L. BARRELL, *President, Hartford State Technical College, Hartford, Connecticut 06106*, and K. NAGARAJA RAO, *Senior Research Associate, Center for Policy Alternatives, Massachusetts Institute of Technology, Cambridge 02139*

# Science

## Engineering Technology: New International Role

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