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# Matching Education to Jobs in Developing Nations \*

One of the important resources of a developing country is human talent—specifically, trained managers and scientist-engineers. Not only is their availability crucial, but their training, experience, and interests should match the economic and job opportunities of their country. To be sure, talented people often develop their own opportunities. But where there is a serious mismatch, opportunities cannot be exploited because of lack of talent, or, conversely, talent emigrates and we witness a "brain drain."

What makes the matching difficult, and calls for planning, is the fact that the training of technologists requires a long lead time. This time can be reduced by giving students a sufficient grounding in the fundamentals of science, so that they can modify their area of specialization to fit changing economic conditions and keep abreast of new technical developments. But it is clearly not feasible to train just generalists; an engineering curriculum, for example, must include some specialization.

In the United States there is little conscious planning to relate academic training to prospective economic development; the marketplace eventually influences the development of new curricula. As a result, there is often a long time lag between requirement and availability, and, conversely, an oversupply of individuals with training of a particular kind after the requirement has disappeared. It is not unusual to find engineering schools teaching courses which are completely antiquated in terms of modern technology. On the other hand, new teaching departments are being set up in fashionable fields having current government support, often with little thought for the real requirements of the future.

For the less developed countries, a waste of trained manpower can be a serious problem. There must be planning if there is to be good coordination between academic curricula and economic development. It is not easy to specify the kind of planning in detail, but it usually involves a decision on which way the national university should expand. A group of experts from the country concerned, working in collaboration with technologists from other countries, might form some estimate of future economic opportunities in the light of probable technical developments.

Let me give some examples. (i) Development of nuclear power and nuclear desalting of seawater will require plants for the reprocessing of nuclear fuel. This will focus attention not only on the disposal but also on the economic utilization of radioactive waste material—developments that will require trained manpower. (ii) If there is a breakthrough in technology for exploiting the resources of the oceans, then a country having trained people would be able to benefit from it immediately. A parallel case is that of the transistor; it was invented in the United States, but Japan, because it had people with the needed training, was able to participate effectively in its exploitation.

The United States has been able to absorb inefficiency in its production of trained manpower. Developing countries, on the other hand, having limited educational facilities, a limited college population, and limited resources, cannot afford waste and will have to plan quite carefully the training and utilization of their human talent.—S. FRED SINGER, Deputy Assistant Secretary for Scientific Programs, U.S. Department of the Interior

\* This editorial is adapted from remarks made before the Inter-American Development Bank, May 1968.—Ed.