

THE PRODUCTION OF TECHNICIANS AND PROFESSIONALS

By
AUGUSTO TENMATAY

I. INTRODUCTION

In producing technical and professional manpower, the main objective should be to obtain a mixture which can contribute effectively to the economic and social growth of the nation. Following the terms of reference given by the organizers of the seminar, the discussion will be confined largely to:

1. The production of manpower in the scientific, technological and related fields;
2. The pursuit of the objectives of the survey; and
3. The statement of problems and suggestions for their solution which may serve as bases, or frames for the formulation of strategies and specific programs.

II. THE PRIMARY QUESTIONS

To define the major problems, formulate strategies and develop programs and procedures for attaining the stated objective, reasonable answers must be given to these questions:

1. What is the present composition of the mixture?
2. What are the main factors that will affect the equilibrium between production and use of technical and professional manpower and social and market demands?
3. How can these factors be related quantitatively and qualitatively to arrive at an equilibrium conducive to socio-economic development, which can be translated to desired composition of manpower by year for at least the next ten years?

Accurate replies will require exhaustive investigations. Partial analysis will need, in addition to the data now being gathered and collated, information from occupational surveys, follow-up studies on graduates, and firmed long-range plans for

national development, particularly in sectors requiring the services of technicians and professional scientific and technological manpower.

Some crucial questions germane to planning for the formation and use of such manpower to support, as well as catalyze economic development are: What are the present and future basic resources for economic growth? What are the anticipated technological developments in agriculture and natural resources, food processing, fishery, mining, manufacturing, infrastructure development, etc.? What are the plans for the expansion of public services, of social welfare programs, of transport, communications, housing, etc.? What are the plans for enlarging sources of income and will the use of developed manpower produce enough added value to justify the cost of manpower training and education? To what extent is economic growth being stifled at present by the shortage of competent skilled manpower? What will be the priorities of the different levels of the educational system? What advances are proposed or may be expected in programs of continuing education, adult education, special education and in the use of educational technology? What changes may be anticipated in the functions of colleges and universities as socializing agents, as change-agents or as vehicles of social and economic change?

III. LIMITATIONS TO IDENTIFICATION OF PROBLEMS AND PLANNING OF MANPOWER DEVELOPMENT AND UTILIZATION PROGRAMS

It is not possible to obtain dependable information on the items cited above within the time limit set for the survey. The lack of reliability and precision of a large part of available data is also a serious limitation. There is also a dearth of critical studies on social, cultural and environmental factors which can promote or inhibit the production and utilization of technical and professional manpower.

For the purpose of this report, the data now available from the survey do not form a pile from which quantitative data can be made. The lack of data need not, however, prevent a qualitative consideration of the central issue. A reasonable picture of the major problems of manpower production and their interrelationships can be drawn. It can be framed with guesses on causes, estimates of future needs and suggestions for strategies for attaining certain objectives. Such an impressionistic analysis — based mostly on informed judgments and expert opinions and observations — can serve several purposes. It may reveal voids in the data structure now being assembled; provide ideas for further in-depth studies; or suggest evaluative criteria and frames for the integration of the sectoral studies of the survey. It may give insights for the translation of generalizations and recommendations into realistic strategies for the implementation of specific programs. Certainly, it presents touchstones for discussion.

The analysis is generalized and exploratory rather than sectoral and definitive. Major problems will be identified and some elements of strategy will be presented together with suggestions for implementation.

IV. APPROACH TO STRATEGY

1. It is safe to assume on the basis of observations, opinions and comparisons with other countries at a similar state of development that the Philippines has a manpower pool of technicians and professionals which is below the requirements for an accelerated program of economic development. The shortages in distribution by occupation and profession cannot be estimated in the absence of occupational survey data. The information is not, however, essential to general planning for effective production. It is not possible anyway to calculate with precision the numbers – by occupation and profession – needed at some future time by a society shifting rapidly from an agro-foundation to an increasingly technological base. Forces such as the entry of new technology, variations in the rate of advance at the different fronts of planned development, market changes, unforeseen manpower demands created by entrepreneurial activity or by a supply of certain kinds of manpower, will alter the best of estimates of future needs. Estimates will of course help greatly in planning, but in their absence, planning can proceed by resorting to flexible and generalized patterns of higher education.
2. The problems generally associated with present manpower production relate to: (a) the imbalance in outputs so that there are shortages in some areas and surpluses in others; (b) poor training, maldistribution, misuse and underemployment; and (c) loss through exodus. It is fair to assume that even if imbalance and wastage are immediately corrected, there will still be shortage in the production of qualified technicians and professionals. Certainly the output of technicians from the formal school system is far below need. Much of the need is supplied by a pool composed of semi-skilled workers with long service experience, graduates from professional as well as vocational schools and short-course institutes offering certificate programs, who are generally inadequately prepared or unsuited for positions of technicians and semi-professionals.
3. The training of technicians and professionals cannot be given at the secondary level because of the need for physical maturity, a certain amount of sophistication, and an adequate background in science and mathematics. Training is usually for a period of one to two years, running to four in a few cases.
4. The problem then is to accelerate the production of competent technicians and professionals. Overproduction of skilled manpower need not be feared. The shift of society to a modern agro-technological base is expected to accelerate very rapidly in the next decade at a rate faster than the development of the production capability of the formal system of higher education under the most favorable conditions. It will be necessary to introduce innovations in the training process in order to meet demands. The manpower need cannot be met simply by the expansion of the present pattern, and by the improvement of

quality to produce more and better graduates. The educational system must be retooled and geared for utilization of its products in the machinery of socio-economic development. This would mean, in general terms, that higher education must be given a broader meaning. Elitism and dualism must give way to the acceptance of the utilitarian aspect of higher education. Higher education must be considered an essential economic and social good for many. Entry to some branch or level of higher education must be opened to as many young people and adults as possible. What is needed is an effective and economical diversified system of higher education accessible to all qualified persons, providing occupational training for those who do not wish or cannot enter colleges and universities. The system must have an effective testing, counselling and guidance mechanism to control the transfer problem which is bound to arise; and to ensure the implementation of an open-door policy to institutions or training centers but not to curricula and courses. The occupational training system must be organized on general patterns directed to the building of cognitive abilities and manipulative skills for a set of jobs, rather than for one particular job. The plan can only work if it is made manifest to the employer (public and private) that the output of the system are trainable for jobs rather than job-trained and that the employer has the responsibility and obligation to provide on-the-job training. There will be exceptions, of course, e.g., secretarial jobs and highly specialized occupations.

5. The present orientation of professional education to the development of basic mental ability, acquisition of general knowledge and sensitivity must be maintained and strengthened. The tendency to direct the curricula toward preparation for particular jobs and occupations – in response to the demands and expectations of employers – must be resisted by educating the employers in the manner described earlier. The quality of outputs from the better schools appears to be satisfactory – judging from the satisfactory performance in graduate work in reputable schools abroad, the attainment of positions of leadership in government and industry, and significant accomplishments in entrepreneurship. However, there appears to be a need to develop productive capability, well as attitudes toward entrepreneurship and creative activity. The lack may be related to the dearth of effective research and development activity in the educational system. Graduate work must be encouraged – and research, as a complement, must be oriented toward the investigation of local problems, particularly in the improvement of production and distribution of strategic materials and the development of industries, especially at the small and medium levels of technology. Significant graduate activity and effective research and development work can set the tone that could generate the spirit of entrepreneurship and entrepreneurship from the ranks of the professionals will create jobs for technicians and other midlevel workers.
6. No amount of good planning and financing for manpower development will succeed, unless firm steps are taken for the:

- (a) creation of attitudes and institution of practices for the appreciation of the importance of technicians and professionals in the economic development of the nation. A system of incentives, rewards and status structures must be established to conform with the demands of socio-economic development;
- (b) organization of technical training and professional education, so that training in employment becomes an accepted practice. The various forms of employment in training must be explored. Personnel development must become a major responsibility of employers, both public and private;
- (c) restructuring and orientation of the system of higher education along the lines described earlier;
- (d) control of the base of resource support to allow a directive, rather than a permissive, management and supervision of production toward desired ends; and
- (e) conduct of manpower production so that the building of abilities and skills is complemented by the formation of attitudes that promote creativity and entrepreneurship.

V. SOME MAJOR ELEMENTS OF STRATEGY

It is clear that long-range strategy can be sensibly formulated only if production and utilization of technical and professional manpower resource is considered a major objective of national policy. Only then can it be properly integrated with general development planning. The implementation of measures must be coordinated with those designed for the solution of basic social, economic and political problems. It is very probable that a new machinery needs to be established at the top level of management for the continuous performance of this function, since strategies will have to be adjusted as development proceeds along various stages and fronts.

The strategy for the immediate future must contain these elements:

1. Formation of nuclei in strategic places for the proposed system of higher education, either through reconstitution of segments from the present base or by a revamp and strengthening of selected institutions. It must be noted that a serious defect of the present system is the lack of adequate numbers of institutions for the training of technicians and semi-professionals. The system must produce an output that will bring the ratio of midlevel skilled workers to professionals to at least 3:1. The system also suffers from lack of organization and standardization of training patterns.
2. Organization of pilot programs for occupational training in employment, as well

as regional training centers for certain highly specialized occupations under suitable arrangements with government agencies, industrial firms, business enterprises, etc. Close coordination with training programs in educational institutions must be maintained. The training of trainers for training-in-employment programs must be a feature of the plan. The participation of educational institutions in this activity must be explored.

3. Building of incentives and rewards to fit contingencies and the formation of attitudes along the lines mentioned earlier.
4. Assistance to, and coordination with, significant ongoing programs that relate directly to the production of technicians and professionals, e.g., the program for the development of science education at the secondary level now being supported by many agencies and coordinated by the NSDB.
5. Studies in depth of some major factors which limit planning and implementation and of those which affect the process of innovation.

VI. SUGGESTIONS FOR FURTHER STUDIES ON RELATED MATTERS

1. Should specialized vocational and occupational training be given at the secondary level? What kinds should be offered, if any, and what should be the pattern of training?
2. What are the factors that obstruct technological development by inhibiting rapid growth in the demand for technicians, semi-professionals and other mid level workers? Some answers immediately come to mind: the emphasis on extractive industries and production of raw materials for export; the persistence of inefficient practices in agricultural production and management; under development of industry at the small and medium levels of technology; lack of enterprise in the production of machinery, equipment, appliances, tools, packaged foods, etc.; dualism and elitism in higher education, which perpetuate the views that training for utilitarian ends is not a legitimate enterprise for higher education, and that occupational education at the post-secondary level is for the incompetents who cannot pursue academic training; and an unrealistic compensation scale for midlevel workers.
3. What steps are being taken and proposed for making life in the rural areas attractive to the youth? Changes in curricula, reform of the education system, building of more schools will not by themselves promote rural development. Opportunities must exist for the productive utilization of highly trained persons in the rural areas.
4. Is it feasible to use educational technology within the next decade to extend the resources of the educational system and bring education closer to the con

munity? How about the use of library services, correspondence training devices and similar instruments to supplement formal instruction?

5. How shall semi-skilled workers, artisans and craftsmen be trained? Training may have to be done in many cases at the post-secondary level because of increasing requirements in cognitive and manipulative abilities of a technical nature. What ought to be the interrelations of such programs with the formal system of occupational training at the higher education level?
6. Are there studies in depth on the use of technical assistance in the development of the local (or similar) educational system and of particular academic institutions, which could be useful to planners for manpower development in the areas under consideration? If none, must such studies be made?
7. What changes in policies, organization and practices can be reasonably expected in the management and support of education at the primary and secondary levels in the coming decade? How will such developments affect the system of higher education? The shape of the educational pyramid – now a squat structure with a very broad base – will very likely undergo appreciable change in the decade ahead. Enrolment at the primary level will increase in proportion to the increase in the population of the teen group, as aspirations rise and demand for better-trained people progressively grow. This increase must be encouraged since the output from the secondary level is the reservoir for the training of highly skilled workers. It is very probable that the production of qualified teachers would not meet the demand. Neither is it likely that salaries and rewards can be made sufficiently attractive to recruit enough promising materials into the teacher ranks and to retain the good teachers. Arrangements have to be introduced to use the resources of qualified teachers effectively, and to multiply the services of this minority. Ways will have to be found to retain them in the service. The situation is particularly serious in the area of science and mathematics. The present number of qualified teachers is very small and the problem is compounded by the lack of instructional materials, equipment, and facilities. The situation has a significant bearing on the production of technicians and professionals, since adequacy of background in science and mathematics is a prerequisite to training.

Cost of expansion will be quite high; and even if effective steps are taken to achieve economies and extend the use of resources and facilities, government financing will be appreciable if the major burden of support for the secondary system is assumed by the government. Higher education will then face serious competition in the claim for support.