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METHODS USED FOR PLANNING EDUCATION WITHIN THE WORK OF THE MEDITERRANEAN REGIONAL PROJECT

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The Mediterranean Regional Project is an international experiment in educational planning in the context of economic development. It is an attempt by a group of developing nations, working in co-operation with the O.E.C.D. to relate the development of their educational systems to the human resource requirements of rapid economic development. As this implies, the project is based on the reasonable, if yet unproven hypothesis, that there is afunctional relationship between educational investment in human resources and the rate of economic development of a nation. The countries which have initiated the Mediterranean Regional Project are concerned with the usual deficiency in skilled manpower in relation to their anticipations of economic growth and structural change in labour force requirements. They are concerned in particular with extreme shortages of trained personnel at the higher occupational levels including technical, professional and managerial occupations. Further they recognize that skills of these levels cannot be developed in the short term and that consequently economic development will depend in large degree on current action to anticipate needs and to establish the educational machinery to develop these human resources. The six countries involved in the Mediterranean Project are Portugal, Spain, Italy, Greece, Turkey and Yugoslavia. The economy of each of these countries is predominantly agricultural. Each is characterized by low levels of per capita income, by the traditional small scale and craft forms of enterprise and by extensive unemployment or under employment of unskilled workers in both the agricultural and non-agricultural sectors. The labor force of each country is relatively unskilled and the average level of educational attainment is low.

On the other hand, all of these countries have a high level of economic aspiration. They expect to achieve and maintain a rate of growth in the national output or gross product of five to seven per cent per year. They anticipate a rising level of productivity in agriculture and a very rapid expansion in the non-agricultural sectors, in particular in manufacturing. In brief they are strongly committed to a general increase in the standard of living by an accelerated process of industrialization.

A basic requisite of industrialization is the development of a skilled and highly specialized labor force. In a traditional society organized on the basis of family enterprise and hand crafts, education becomes a primary means for the development of an industrial labor force. First, in that it can disrupt the traditional forces which have dominated the allocation of labor resources, and second, in that it may develop the specialized skills necessary to more appropriate allocation. Although the first of these considerations is implicit in the Mediterranean Regional Project, it is the need to develop specialized occupational skills in appropriate

quantities that is the explicit basis of the Mediterranean countries commitment to educational planning.

The task of those engaged in the project is, in summary form, to forecast or project the characteristics of an economic system capable of producing a desired rate of output at some future time, to translate these characteristics into quantitative and qualitative measures of manpower requirements and to plan an educational system capable of meeting these manpower needs as they develop. The educational system includes, in this context, not only the institutionalized system of education but programs of vocational and technical training on the job, general adult education and other informal elements of education. The main purpose of this paper is to describe the methodology used for this purpose and to consider, although very briefly, some of the more important methodological problems which have been encountered. Before doing so, however, it may be useful to digress briefly for a short discussion of the formal organization of the Mediterranean Regional Project.

We noted earlier that the Project was initiated bilaterally by the six countries through the instrument of the O.E.C.D. Committee for Scientific and Technical Personnel and operationally, with the Directorate for Scientific Affairs. The major work is being conducted in each of the six countries by a team of five or six economists, statisticians and educationalists headed by a distinguished senior economist or educator. In each case, the national teams are able to draw on the assistance and work of other governmental agencies in regard to data, surveys and economic projections. Further, they have had the assistance of O.E.C.D. consultants and other experts in the field of economic development and educational planning. I should like to mention in particular my colleague at Ohio State University, Dr. Herbert S. Parnes, since much of the following discussion of methodology is drawn from his work as an O.E.C.D. consultant and from his book on manpower and educational Planning now being published by the organization.(1)

In addition to the national teams and the consultant group, the work of the Mediterranean Regional Project is being assisted by a group of twenty young economists and sociologists holding Mediterranean Regional Project Fellowships. The fellowship program, initiated by the Secretariat in 1962, is intended to provide a training experience for the development of specialists in manpower and educational planning. Each fellow has completed a fromal training course conducted by the Secretariat and is assigned to a national team for field experience. During the field period fellows have worked directly with the national teams and as individuals in specific research of their own design.

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(1) "Planning Education for Economic and Social Development", Herbert S. Parnes, O.E.C.D. /D.A.S. Paris, 1962.

The relevance of the organization of the Mediterrenean Regional Project to this methodological discussion is two-fold. First, the national studies are the products of national teams and consequently the methodology used in each case varies with differences in the economic conditions and educational structure of countries, as well as with the technical orientation of the project group and the adequacy of the data available to them. Second, there are major differences in the extent of economic and social planning within the Mediterranean group, with consequent effects on the nature of the process of educational planning. In a planned economy the work of the national team is likely to be linked directly to an existing economic plan and to the work of other planning agencies. In some degree the methodological choices available to them will be determined by the structure of this related work. In the absence of general economic planning , the national team must develop their own economic projections and their own assumptions concerning social priorities.

In regard to the question of social priorities , we shoul also recognise on existing controversy concerning the objectives of educational planning. Education is both a means to expanded economic activity and an end toward which economic activity is directed . In the choice of social goals, planners must establish priorities between the use of resources for the purposes of education and their use for other social objectives . Educational planners must also choose among the various uses to which education may be put . In practical terms, these questions are expressed in the choice of assumptions concerning the proportion of a nation's resources that should or can be used for educational purposes and/ or assumptions concerning the desired qualitative structure of a given educational system.

Those who are concerned with education as an end product in the cultural sense are likely to use a methodology designed to estimate the socially necessary level of education without distinguishing among the variety of cultural needs. Those concerned with education as a means will place emphasis on the problem of distinguishing and quantifying manpower needs. As Professor Parnes has suggested in the document cited above, this difference in concept and methodology is more fancied than real. It is impossible in practical terms to distinguish between economic and social needs, since both are expressed in the individual . One can hardly conceive of an educational system designed to develop the individual as a human resource in purely technical or vocational terms. At the same time , it is equally impossible to conceive of an educational system without important vocational implications for the individual . The Mediterranean Regional Project is concerned primarily with the economic implications of education and therefore the methodology characteristic on manpower requirements. It does not, however, ignore or neglect the many other purposes of education.

In broad outline, a manpower approach to educational planning involves a comparison of estimated manpower requirements for a target year with the estimated supply of manpower for that year. Manpower requirements in both estimates are expressed in terms of educational

qualification and the target year is the end of a period long enough to permit required changes in the output of the educational system. The educational plan then involves expanding and restructuring the educational system to equate the level and composition of its output with the estimated pattern of manpower requirements. To illustrate this statement in specific terms, we might use as an example the occupation of chemists . We need first to know the number of qualified chemists now in the labor force and the proportion of them who will remain in the labor force in the target year . To this number we would add the number will join the labor force in the interim period as products of the present educational system or as a result of migration . Second,we need to forecast or project the level of economic activity and the structure of the economy in the target year as a basis for estimating the number of chemists required . Finally, we would project the necessary changes in the educational system if it is to increase the projected supply to the projected level of requirements.

This example introduces some distortion since it is not essential to estimate most occupations as specific occupations . In other words, the occupation, chemists, may be grouped with all other occupations having generally similar educational qualifications. It is only necessary for purposes of educational planning to know that future manpower requirements include a certain proportion of persons with technical training at the University level or at some lower level of educational attainment .

A systematic description of methodology begins with an inventory of manpower in the base year . The basic purpose of this inventory is to project the present stock of manpower to the target year in terms of occupation, branch of industry and level of education. This is done by applying rates of mortality, migration and withdrawal or retirement to the existing laborforce . Since these rates vary by age and by sex, the current inventory must be classified on these characteristics as well as those desired for the terminal year - i.e. occupation,industry and education.

The second element in the process involves a projection of the total labor force in the terminal year by aggregating the depleted existing stock with the flow of new entrants into the labor force. This requires the estimation of flows of entrants by the application of mortality rates, labor force participation rates and educational participation rates to the present population of appropriate ages. Again, these rates are both age and sex specific. Having developed an estimate of the supply of labor in the target year, the next step in the procedure is to estimate manpower requirements is that year.

In ideal form, projections of manpower requiremements are derived from projections of economic activity by branch of industry. If it is possible to project a rate of economic growth in the gross national product and to allocate the target year output by branch of industry, employment can be estimated by applying projections of labor productivity to industrial sector outputs. The number of variable factors involved in such projections, however, will usually require other methods of approximation. One method of doing so is to extrapolate future gross national product from current levels on the basis of anticipated changes in the civilians labor force, adjusted for changes in productivity, hours of work and unemployment rates. The gross national product so derived can then be allocated by branch of industry by extrapolating trends in the value added to gross product by each industry branch.

The objective of the proceeding analysis is the projection of the occupational distribution of manpower requirements, since occupation can be converted into educational qualification. Projection of employment by industry branch are essential only because the occupational distribution of employment varies from one industry to another. Shifts in the industrial structure of the economy will therefore produce changes in the occupational composition of the labor force. Occupation patterns also vary within industry branches, so that once the industrial structure has been projected, it is necessary to estimate the future occupational distribution for each industry branch.

If adequate data were available, this might be done by the projection of past trends, i.e. by projecting changes in the ratio of a specific occupation to total employment. However, data adequate to this method are rarely available. Most commonly the method used has been that of applying to total employment in each industry branch the pattern of occupation of that industry in a more advanced country at some comparable stage in its economic development. For example, Italy might use for a 1975 projection, the occupational pattern of an industry in the United States in 1940.

A second possible solution to this problem is to apply to the target year employment, the occupational distribution of the most advanced firm in the industry. This assumes that the industry as a whole will achieve that stage of development by the target year. Whichever method is used it is necessary to adjust the results on the basis of a reasoned judgment of the conditions peculiar to the project country or other known factors shaping its development.

The final step in the manpower analysis, in preparation for the development of the educational plan, is to express occupations in terms of educational qualification. This process is complicated by the fact that educational structures vary among countries so that vocational preparation and level of education do not have the same relationship everywhere. Further, there are different ways of preparing for a vocation within countries

TABLE I

HYPOTHETICAL CALCULATION OF REQUIRED ADDITIONAL "OUTPUT" OF EDUCATIONAL SYSTEM, 1961-1975, TO MEET REQUIRED EDUCATIONAL QUALIFICATION OF LABOUR FORCE, 1975

(IN THOUSANDS OF PRESONS)

Level and type of educational attainment	(1) Forecast of required number of workers	(2) Forecast of actual number of workers	(3) Shortage in number of workers	(4) Cumulated shortage in unmber of workers	(5) Required expansion in graduations 1961-1975	(6) Required increase in annual number of graduations 1966-1975
University graduates	1,200	800	400	400	570	57
Science curricula	500	300	200	200		
Other curricula	700	500	200	200		
Higher secondary school graduates	5,200	1,550	3,650	4,050	6,140	614
Scientific and technical	2,800	700	2,100	2,300		
Commercial and general	2,400	850	1,550	1,750		
Lower secondary school graduates	10,000	7,650	2,350	6,400	10,670	
Less than 8 years of schooling	3,600	10,000	-	-		
Total	20,000	20,000				

SOURCE : ibid. PARNES, P. 51

and from one country to another and, finally, job titles do not always indicate the same level of performance. For example, the title of engineer may represent varying levels of function and thus different levels of educational requirements.

In the Mediterranean Regional project occupations have been classified according to a classification system developed for the project and based on the International Standard Classification of Occupations published by the International Labor Office. The Mediterranean Regional Project modification fitted the I.L.O. classification into four broad categories:

"Class A: All occupations for which a university education or an advanced teachers' college degree, or its equivalent would normally be required. "

"Class B: Occupations for which two or three years of education beyond the secondary level (12 years) may be required."

"Class C: Occupations for which a secondary school education (either technical or academic) or its equivalent, would normally be required."

"Class D: All occupations not included in Class A, B, or C."

Furthermore, Class - occupations should be subdivided into those that normally require scientific or technical education and those that require general academic education.

Unfortunately, it is not possible to project educational requirements by the simple application of this classification system. Such an application would represent the ideal in vocational preparation. In reality some proportion of the persons in each occupation will not possess this level of qualification. It is necessary to estimate these proportions and apply them to the data derived by classification in order to obtain a realistic estimate of required educational output. The proportion may be estimated on the basis of industrial case studies, international comparisons, when data have been developed elsewhere, or refined studies of job content and educational preparation in relation to job performance.

At this point we are in a position to tabulate total requirements for the target year by educational level and to compare these requirements with the previous estimates of supply. Having done so, we are then in a position to establish educational targets. An illustration of the data resulting from the analysis to this stage and on the basis of which the educational plan may be erected is given in Table I to which I now refer.

The data in this table, taken from Professor PARNES study, indicate the projected manpower requirements by educational level, the forecast supply by educational level and the anticipated shortages in each level (column 3). In column (4) these shortages have been cumulated, since the number of graduations in each level includes the number who will pass on to the next level, as well as those who will terminate their education at that level. The figures in column (4) must also be adjusted, since all graduates will not enter the labor force. This adjustment is made by applying age specific and sex specific labor force participation rates with the result indicated in column (5) as the total number of graduations required. In the final column, these totals are expressed in annual rates.

To this point, we have estimated the required number of graduations from each level but clearly this is not the same as the necessary enrollments since not all persons who will enroll at each level will complete that level. The final adjustment thus involves the adjustment of required graduations by the application of attrition rates. For example, if the first year attrition rate in a four year university program is 20 per cent and this rate declines by 5 per cent in each succeeding year, 98,000 additional first year enrollments will be required to produce the 57,000 additional graduations indicated in column (6) of Table I. The total required expansion of university enrollments would be 304,000.

The ulimate objective of this rather tortuous process is the development of an education plan that can be implemented by the responsible public agencies. For this purpose, additional manpower requirements, expressed in terms of additional enrollments must be interpreted in terms of additional teaching personnel, class room facilities and other requirements. These, in turn, should be described in terms of cost.

There are a number of variables complicating the task of educational planning even when the educational targets are given. As an example it may be assumed that the necessary expansion in the number of teachers is a direct function of increase enrollments and the structure of the educational system. Yet obviously, the productivity of teaching is quite variable and may be more variable in the future with the expansion of electronic and other aids in the learning process. It is customary in estimating teacher requirements to begin with existing pupil-teacher ratios and to adjust these ratios on somewhat arbitrary groungds. In most developing countries the pressure of shortages in the teacher supply will influence choice in the direction of larger classes. On the other hand, the social need for improvement in the quality of education will demand the reverse. Rational choice in this regard is further limited by the absence of real knowledge concerning optimum class size under varying conditions and by the crude form of available statistics on which ratios are based.

Under these conditions, the standard for teacher-pupil ratios is generally derived from international comparison or from "model" school system. As teacher salaries are also variable, personnel costs may be

projected on the basis of adjusted trends in salaries or, as Professor EDDING suggests, 2/ by assuming that thay move parallel to real output per employed person. A similar analysis may be applied to non-teaching personnel, including maintenance and administrative personnel, to provide estimates of "current" costs for the target year and the interim period.

The type and costs of investment in physical plant and equipment present similar problems of analysis. The number of class rooms required may also be estimated on the basis of class size, with the same limitations as in the projection of teacher requirements. Given, the number of class rooms needed by type, it is necessary to depreciate existing facilities at a rate depending on their current age and adequacy and to aggregate replacement building with that required by additional enrollments. Since unit construction costs vary widely between regions, detailed plans for the distribution of facilities and detailed studies of unit costs in each region are required.

Perhaps, I may terminate this discussion with a few general comments concerning the Mediterranean Regional Project and its methodology. First, this project is oriented toward the role of education in economic development. Consequently, it has given great emphasis to economic as distinguished from cultural needs. The degree of emphasis is however overstated in this discussion by limits of time. In each situation, the manpower analysis provides one set of criteria for the educational plan. In every case, they are adjudicated in the light of other and broader social requirements.

Second, the Mediterranean Regional Project has contributed greatly to orderly and rational approaches to educational planning. From it, there is evolving a substantive body of methodology which will serve the increasing need for action in this area. At the same time, the project has revealed a need for extensive, detailed research in the many areas where arbitrary, if reasoned, judgements have substituted for known relationships.

The impact of the Mediterranean Regional Project on educational investment is not yet clear. It seems evident to those who have been involved in the project that its ultimate effect on the participating countries will be great. This experience should be extremely useful in the many areas of the world which are now concerned with rapid economic expansion and its requisite investment in human resources.

2/ Estimating Costs of Educational Requirements, Friedrich EDDING O.E.C.D. / D.A.S., Frascati, 1962.

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