Educational planning and human resource development

F. Harbison

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Fundamentals of educational planning

The booklets in this series are written primarily for two groups: those engaged in—or preparing for—educational planning and administration, especially in developing countries; and others, less specialized, such as senior government officials and civic leaders, who seek a more general understanding of educational planning and of how it can be of help to over-all national development. They are devised to be of use either for self study or in formal training programmes.

The modern conception of educational planning has attracted specialists from many disciplines. Each of them tends to see planning rather differently. The purpose of some of the booklets is to help these people explain their particular points of view to one another and to the younger men and women who are being trained to replace them some day. But behind this diversity there is a new and growing unity. Specialists and administrators in developing countries are coming to accept certain basic principles and practices that owe something to the separate disciplines but are yet a unique contribution to knowledge by a body of pioneers who have had to attack together educational problems more urgent and difficult than any the world had ever known. So other booklets in the series represent this common experience, and provide in short compass some of the best available ideas and experience concerning selected aspects of educational planning.

Since readers will vary so widely in their backgrounds, the authors have been given the difficult task of introducing their subjects from the beginning, explaining technical terms that may be commonplace to some but a mystery to others, and yet adhering to scholarly standards and never writing down to their readers, who, except in some particular speciality, are in no sense unsophisticated. This approach has the ad-
vantage that it makes the booklets readily intelligible to the general reader.

Although the series, under the general editorship of C. E. Beeby, has been planned on a definite pattern, no attempt has been made to avoid differences, or even contradictions, in the views expressed by the authors. It would be premature, in the Institute's view, to lay down a neat and tidy official doctrine in this new and rapidly evolving field of knowledge and practice. Thus, while the views are the responsibility of the authors, and may not always be shared by Unesco or the Institute, they are believed to warrant attention in the international market-place of ideas. In short, this seems the appropriate moment to make visible a cross-section of the opinions of authorities whose combined experience covers many disciplines and a high proportion of the countries of the world.
Foreword

These two essays on human resource development are written by one of the world's leading authorities on the subject. Frederick Harbison is professor of economics at Princeton University, a nationally known labour economist, and a member of the IIEP's Council of Consultant Fellows. He has had exceptionally wide experience in human resource development in emergent countries. He has served as a consultant to Unesco, ILO, OECD, AID, the World Bank, and the Pan-American Union, besides assisting in manpower and education surveys in several African and South American countries. He is chairman of the Committee on Education Planning and Human Resource Development of Education and World Affairs in New York.

Mr. Harbison does not write from the point of view of any special discipline. He has learnt to see the manpower and educational problems of developing countries in the round, and part of what he has to say may be as novel to some of his fellow economists as it will be to the many educationists, administrators and politicians to whom the planning of human resource development has always been something of a mystery. He manages to clear the subject of its mystery without robbing it of any of its interest.

C. E. Beeby
Center for Studies in Education and Development, Harvard University
Priorities and choices
in human resource development
Planning and strategy building

When we consider the various kinds of educational planning which are in use today, we can distinguish three main types.

The first is planning with adequate facts, backed by rather voluminous statistics. This type is certainly the most desirable, but it is the one least likely to be carried into effect simply because, in practice, the necessary facts and statistical data are seldom available.

The second type of planning can perhaps best be defined by the title of a book by Wolfgang Stolper, who spent two years drawing up the development plan for the Federation of Nigeria. His book is called Planning Without Facts, a very realistic title, because it corresponds to a very realistic type of planning. In many cases, it is simply impossible to ascertain all the facts ideally necessary for perfect planning.

At the meeting of the Inter-American Regional Project in Mexico City in October 1963, Pitamber Pant of India defined the third type as planning without purpose or planning for the sake of planning. Unfortunately, there is a good deal of such planning going on today, particularly the kind which makes use of the more questionable techniques of highly theoretical mathematical models and in which the basic objectives get lost in a display of methodological fireworks.

But whatever planning is used, whether it be with or without facts, the importance of strategy building is fundamental to the process. In the context of educational planning, this involves, first, the setting of targets. This means not projections and most emphatically not forecasts,

but the imparting of directions which are to govern subsequent actions. The targets can, certainly, be modified from time to time in accordance with experience gained in the course of the planning process.

Reaching the targets implies a plan, a programme for action based upon a choice of priorities. Priorities are then the second vital element in strategy building. No country can have all the education which it thinks necessary or desirable. Rather, any country must promote or emphasize programmes which have high priority and discard or tone down programmes which have low priority.

Strategy building thus involves the making of assumptions, which may only sometimes be correct and which often must be based on intuitive judgements. It involves, above all, the making of choices, sometimes very difficult choices, and planners, particularly educational planners, often fail to realize that the choice of one objective implies the rejection of others. If you choose to put your resources into one area, you thereby choose not to put them in other areas.

As far as educational development is concerned, six such critical areas of choice will be outlined here, without indication, however, of what the actual choice should be, as this depends largely on real conditions in any country.

**The choice between the levels of education**

The first choice is between the levels of education. What emphasis should be made on primary, secondary, and higher education when making investments in education? You can give top priority to universal primary education, but only at the expense of secondary and higher education. Or top priority can be given to secondary education, second priority to primary education, and third priority to higher education, but you cannot give top priority simultaneously to primary, secondary, and higher education. No strategy of educational planning is complete until this choice has been made.

**The choice between quality and numbers**

The second and even more fundamental choice is that between quality and numbers. Which is to be emphasized? In the field of primary education, for instance, do you aim at compulsory universal schooling, with few textbooks, poor teaching methods, and teachers who will necessarily have very low qualifications? Or do you want well-qualified teachers, better textbooks and better teaching methods? If you choose the second

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alternative, economic necessities may force you to sacrifice numbers in order to achieve quality, that is, to sacrifice the ideal of universal primary education.

There is a difference between schooling and education, and the choice between quality and numbers arises throughout the whole educational system. Latin American universities, for instance, with some notable exceptions, have part-time professors, part-time students, and poorly equipped laboratories and libraries, because not enough money is spent on teachers and equipment. These universities provide inexpensive education, mass education, which may, at this stage of its development, be the right kind for Latin America, but there is also another kind of education, which emphasizes excellence and high standards, full-time teachers and students, well equipped laboratories and well appointed libraries. The question is, what kind of balance do you strike between these two types of higher education, since you cannot have both numbers and quality? The clamour for higher education has become so great and so general that, politically, it has become almost imperative to sacrifice quality to numbers. In one developing country, for example, there are 100,000 full-time university students, a higher proportion of the population than in the Federal Republic of Germany or in the United Kingdom! This is a typical case of overemphasis on cheap mass education, at least in certain areas of higher education.

Science and technology v. the liberal arts

The third choice, more particularly in the field of higher education, concerns the balance between science and technology, on one hand, and the liberal arts, on the other. What proportion of your students should attend science and engineering faculties, and what proportion should study the arts, humanities and law? This is not a question of the intrinsic value of these subjects, but rather one of the practical needs of the country. If you decide to increase the number of science and engineering students, you are immediately faced with a thorny financial—and political—problem. Education in science and engineering costs roughly four times more per student than education in the arts, humanities and law. Financial necessities may therefore compel you to balance any expansion in science and engineering studies by a fourfold contraction of liberal arts studies. It is easy to imagine the tremendous political and social pressures against such a move, particularly in the countries of Latin America.
In fact, the choice between science and technology and the liberal arts becomes to some extent a choice between quality and numbers. By and large, the lowest quality education is in law, humanities and the arts, because they lend themselves to the use of large classes and the employment of ‘taxi’ teachers. Science and engineering, however, require much higher standards of teaching, more expensive facilities, and many more full-time teachers. In the non-communist world, about 25 per cent of the student body is enrolled at science and engineering faculties, and in communist countries, the proportion varies between 45 and 50 per cent. Of all the continents, Latin America has the lowest proportion of students in science and engineering—somewhere around 15 per cent. The educational planner must keep such figures in mind when deciding on the proper balance between scientific and non-scientific education.

Formal education v. non-formal training

The fourth area of choice lies in the relative emphasis upon formal education, that is, education before employment, and training by employing institutions, or on-the-job training. This problem becomes particularly acute at the craftsman level. It has been amply demonstrated that pre-employment training of craftsmen in secondary vocational schools is a poor investment in most countries. It is far more advantageous to provide potential craftsmen with general secondary education and then develop their skills on the job. In other words, formal pre-employment education should aim at forming trainable people, while the task of developing specific skills should be the responsibility of employers, both public and private.

In some Latin American countries, an interesting arrangement has been worked out. Colombia, for instance, has a system of training related to employment in industry which is financed by a payroll tax on all employers who employ ten people or more. The funds thus provided support a training organization called SENA, completely independent of the ministry of education, which trains those who are employed or are about to be employed in the various industries. Similar arrangements exist in Venezuela and Brazil.

Shifting the job of training onto the shoulders of the employers makes more funds available for formal general education. However, the choice between pre-employment vocational education and training on the job is always a difficult one, and the balance between the two is struck differently in different countries.
The choice of incentives

The fifth area of choice, which is of great importance to the general planner as well as to the educational planner, is that of incentives. To get people into certain occupations, do you rely on the free play of the market or do you provide incentives and manipulate them constantly, as the situation demands, so as to create differential salary scales and raise the financial rewards and status of particular types of jobs? This is a vital and very difficult problem in many countries. In Iran, for example, the proportion of doctors to nurses is 10 to 1, where it should be about 1 to 10. The reason for this is that the salary and status of nurses are so low that nobody wants to enter the nursing profession. Similar considerations apply to technicians, engineering assistants and agricultural assistants in many countries. As a result, it is often more important for the educational system to produce nurses rather than doctors, or engineering and agricultural assistants rather than graduate engineers and agronomists.

Confronted with a situation of this kind you can leave the differentials in pay and status as they are, or you can work out a new system of remuneration which rewards the technician willing to dirty his hands in the factory as much as the graduate engineer who refuses to budge from his office, and the medical technician who goes into the bush to treat people with antibiotics and promote measures of public health as much as the doctor who refuses to move out of the urban centre. These are difficult choices to make, but unless they are made thoughtfully, great amounts of money will be wasted. The study of incentives is an integral and indispensable part of educational planning, and a planner who ignores the incentives structure of his society is like an ostrich hiding his head in the sand.

The purpose of education

The sixth and last area of choice is concerned with the very purpose of education. Should education aim at satisfying the needs, desires and hopes of individuals, or should it be directed towards meeting the needs of the state?

Countries professing the so-called liberal philosophy would naturally favour the first alternative, and those professing the communist philosophy would choose the second, but the problem is not nearly so simple in the new, developing countries.
In Malawi, formerly Nyasaland, there is no need for a high-level manpower survey. It is possible to know everyone in this category by his first name, because in 1965, there were only forty-five of them. Every year Malawi can send about twenty-five or thirty students to foreign universities, but there are some 720 government jobs open for university graduates and thirty jobs open to Malawi citizens in international agencies of the United Nations family. It is possible, therefore, for a Malawi citizen to be educated abroad at public expense and spend the rest of his life working for international agencies. In fact, it is possible for at least thirty Malawi citizens to take this course. Now, are you going to allow complete freedom of choice to such students sent abroad at public expense, on the theory that anything that is good for the individual is good for the country, or are you going to take steps in order to remedy such a critical situation?

Admittedly, the case of Malawi is extreme but similar situations, though less accentuated, arise in other countries. We know, for example, that there is a net export of doctors, scientists and engineers from the Latin American continent to the highly developed countries. Given the urgent needs of Latin America for high-level manpower, is this freedom of choice a good thing? This is a question which every country and every planner must answer individually, but it is not a question that can be avoided.

The essence of strategy building is thus the making of choices in the six critical problem areas described above, and it is difficult to make these choices so wisely as to strike the proper balance between priorities and so promote the social and political, as well as the economic, goals of the country.

Let us now consider, on the basis of what has been said above, the manpower needs of an imaginary country and the ways and means by which these needs can be met.

Meeting the needs and demand for education: a model

It is convenient to take an imaginary country as a model, you since can express yourself freely without insulting any particular country and still reveal a few truths of practical relevance to a number of countries.
The priorities of manpower needs

It is assumed that a manpower assessment, quantitative or qualitative, has been made for that country and as a result an order of priorities determined for increasing certain categories of manpower to meet social, political and economic goals.

The first priority seems to be an increase in the number of technicians and sub-professional personnel. Industrial development calls for engineering assistants and senior foremen. Land reform, which is to be carried out, requires a large number of agricultural technicians, not agronomists, to carry the ideas to the farmer. The state of the hospitals and health services makes it imperative to have many more nurses and medical technicians. This is then the category of manpower most urgently needed and requiring the greatest proportional increase.

The second priority in this particular country is an increase in the number of teachers at all levels, but especially teachers of science and engineering in universities. There is also a critical shortage of mathematics and science teachers in secondary schools.

The third priority must be given to graduate engineers and scientists. The progress of industry requires an expansion in research and development facilities, and agriculture, if it is to be developed according to plans, needs more agronomists, soil scientists and agricultural engineers. There is also a need for the ‘soft-headed’ scientists, the economists and sociologists, because the country in question has a planning organization and must deal with the economic and social problems of development.

The fourth priority is the provision of managerial and executive personnel. All countries need more personnel at this level, and though managers and executives are not necessarily trained in universities as such, they can be drawn from other professional sectors. It is assumed therefore than a certain proportion of graduate engineers, lawyers, and the like will eventually become managers, mostly by training on the job in private enterprises or in government services.

The fifth priority relates to clerical and secretarial personnel, of which there is a shortage in this particular country, though not a very great one.

The sixth priority must be given to craftsmen. Here the shortage is very great, but it is recognized that the consequently great needs can best be met by training on the job, rather than the creation of specialized pre-employment vocational training centres.
Near the end of the list are medical practitioners, seventh in our order of priority. Perhaps more doctors are needed, but the more severe problem is that the doctors at present available cannot be utilized to best advantage without a substantial increase in the number of sub-professional personnel, nurses and medical technicians. Moreover, in this particular country, the number of doctors is very high compared to other professions, because doctors enjoy high earnings and status.

Last on the list are the lawyers, those much maligned men, who find it difficult to get jobs in this country and are literally a drug on the market, though their country may need legal men of higher capacity and more unusual merit.

These, then, are the main findings of the manpower survey, which must now be translated into educational terms.

**The educational priorities**

In this instance, the educational planner will give highest priority to secondary general education on a free basis, because there are relatively few places in existing secondary schools, and their high fees constitute a financial and social bottle-neck, a barrier to general higher education.

The second priority will be given naturally to sub-professional and technical education, and the third to teacher training, also at the sub-professional level. The fourth priority will be given to the expansion of higher studies in science and engineering, to raise the proportion of students in these two fields from 15 per cent (the figure for the imaginary country) to 20 or even 25 per cent.

Fifth in the order of priority will be general adult education or basic education, because the population is largely illiterate, and some kind of adult education is indispensable for successfully carrying out land reform and bringing the mass of the people into the twentieth century. Primary education is next, followed by higher medical education and, finally, pre-employment vocational schools.

The manpower survey of this country has stressed the importance of non-formal education, out-of-school training, and training on the job. This includes part-time courses for those preparing for, or now in, managerial and executive jobs, training of craftsmen, perhaps along the lines followed by the SENA organization in Colombia, and in connexion with land reform, massive programmes of farmer training by agricultural extension services. Moreover, because of the rapid pace of technological development, old skills become obsolete, and there is need for a
continuous re-training programme. As John Gardner wrote recently, there should be 'provision made so that individuals have the capacity for continual self-renewal as they perform and grow on their jobs'.

By means of a table which we shall call an analytical sweat-box, we will now consider the needs, the demand and supply with regard to the various categories of manpower discussed above.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Need</th>
<th>Demand</th>
<th>Supply facilities</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technicians and sub-professional people</td>
<td>Very large</td>
<td>Very small</td>
<td>Very small</td>
<td>Low status and pay; few opportunities for advancement</td>
</tr>
<tr>
<td>Teachers</td>
<td>Very large</td>
<td>Small</td>
<td>Small</td>
<td>Low status and salary</td>
</tr>
<tr>
<td>Scientists and engineers</td>
<td>Large</td>
<td>Large</td>
<td>Very small</td>
<td>High status and pay, but high education costs</td>
</tr>
<tr>
<td>Managers and executives</td>
<td>Large</td>
<td>Large</td>
<td>Small</td>
<td>Escape from drudgery for women</td>
</tr>
<tr>
<td>Clerical and secretarial</td>
<td>Large</td>
<td>Large</td>
<td>Small</td>
<td>Escape from drudgery for women</td>
</tr>
<tr>
<td>Craftsmen</td>
<td>Large</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctors</td>
<td>Small</td>
<td>Very large</td>
<td>Very large</td>
<td>High status and income</td>
</tr>
<tr>
<td>Lawyers</td>
<td>Very small</td>
<td>Very large</td>
<td>Very large</td>
<td>High status; overflow from other faculties</td>
</tr>
</tbody>
</table>

Needs, demand and supply

First of all, a clear distinction must be made between needs and demand in the context of manpower studies and education. Needs are determined by the manpower assessment and represent the country's manpower or educational requirements to meet specific social, political and economic goals. Demand reflects individual desires to prepare for a particular profession or trade, the desires for given types of education. There is no necessary connexion between the two; as will be seen, needs and demand can diverge very widely.

In fact, the first row in our table shows that whereas the need for technicians and sub-professional personnel is very large, the demand for this type of education is very small, and consequently the supply is also very small. The reason is that in this particular country, no one wants to be
a sub-professional, because such people have low pay, low status, and very limited possibilities for advancement. The educational planner’s recommendation of larger facilities for the training of technicians and sub-professionals would be irresponsible, because these facilities would simply not be utilized. For example, in Nigeria by far the most critical need was for sub-professional personnel in agriculture, but when new facilities for training such people were made available, it was impossible to fill more than a quarter of the places, because there was no incentive to enter into this particular occupation. In such a case, the educational planner must first tackle the problem of incentives.

In the next row, it is clear that the need for teachers is very large, but the demand is small, again because of their low salary and status, and therefore the supply is also small. Here the planner must somehow increase the attractiveness of the teaching profession, at least in the most critical sectors. Only after that can he think of increasing the supply of teachers by putting more money into teacher-training institutions.

Where engineers and scientists are concerned, the need is large, though not as large as for technicians and sub-professional personnel, and here the demand is also large because of the relatively high status and pay of this category of professionals. However, the supply of this kind of education is very small because it is expensive. Here the educational planner need not worry about incentives; with the great need and demand, the obvious course is to expand the number of places, but the obvious difficulty is the high cost of scientific and engineering education.

The case of managers and executives illustrates the drawback of a chart: not everything fits into it. It has been shown that pre-employment business schools are not suitable for developing countries, because they tend to turn out clerks rather than managers. What is really needed is in-service training and manager development programmes for engineers, lawyers and liberal arts graduates, for people from all ranks who want and are able to become managers and executives. Managerial training is not specifically a job for the educational system, though the system should turn out people sufficiently qualified to become managers after suitable training. This, therefore, is one of those happy situations in which the educational planner can say that the solution lies outside the formal educational system, though not necessarily outside the planner’s province.

In the category of secretarial and clerical personnel, the need is large, and the demand is large for this kind of education because it provides a good chance, for women especially, to escape from the drudgery of the
rural home to the glamour of the urban office. However, facilities for training are small, and training on the job is not very suitable for this kind of personnel. Here then is a good area in which to expand secondary vocationally oriented education.

Craftsmen, for whom the need is large, form another group that does not fit well into our chart because, like the managerial group, it does not fit well into the formal educational system. This is a prima facie case for training on the job.

The need for doctors is very small because the country has always produced a very large proportion of doctors; the demand for and the supply of medical education are both large, because of the high status and earnings of medical practitioners. Here the educational planner faces a very difficult political problem indeed. If he recommends a cut in medical school funds in favour of, say, the engineering schools which are needed much more, he will ensure the enmity of powerful social groups and may find himself and his plan in great trouble. (In certain countries of Latin America, for example, you simply cannot cut medical school funds.) What you may do, however, is not expand these schools until a more realistic balance is achieved in the supply of doctors.

Finally, the need for lawyers is very small, but the demand for legal education is very large, and so is the supply. This also applies to graduates in the liberal arts. In this particular country, people who seek high status, but cannot get into medical school or have not the brains to follow scientific or engineering studies, go in for the law and liberal arts. The political pressures in this area are even stronger than in the case of doctors, and our political planner may well conclude that he simply cannot solve the dilemma. A planner who publicly declared that a certain Latin American law faculty should be cut to half its size provoked a strike of all the students of that university, and in Latin America, students and recent alumni exert great influence in university councils. The solution lies perhaps in developing new incentives and attitudes, but this is by no means an easy task.

This exercise in manpower categories could be repeated with regard to levels of education, but this is hardly necessary. Such as it is, it enables us to draw certain conclusions.

Conclusions

The first conclusion is that the building of strategy is certainly not a process of getting accurate statistics, or even of uncovering real facts.
The central problem of the educational planner is to be able to identify on his intellectual radar set the really critical problems involved in human resource development, and this can be done with very meagre statistical information. If you have good statistical information, you will be all the better for it, but there is no excuse for refusing to define the problem because statistics are not available. Moreover, the educational planner should never wait for a complete manpower assessment before he begins to identify the problems, because he may have to wait a very long time.

The second conclusion is that some critical problems in education can be solved by increasing the output of educational institutions, by investment in particular sectors of the educational system, such as science and engineering faculties, free secondary schools, and so on.

However, this must be qualified by a third conclusion, which is that many of the critical problems in education can best be solved outside the system of formal education and as far away from the ministry of education as possible, by a policy of shifting wherever possible the burden of training from pre-employment educational institutions to employing institutions.

The fourth conclusion is that some problems of human resource and educational development involve fundamental changes in the incentives structure and even in the whole configuration and attitudes of the society, and that these basic changes may have to precede the actual investments in education. Indeed, the educational planner must never be confused by statistics which show a great need for a particular category of manpower if prevailing social and material incentives make people unwilling to enter into that category.

This leads to the last conclusion, which concerns the qualities an educational planner should have. First of all, his knowledge must be very broadly based. If he does not know the techniques and objectives of general social and economic development planning, he has no business planning education. If he is prepared to wait for the economist to tell him what the needs of the country may be in terms of high-level manpower, he openly acknowledges defeat, even before undertaking the job. The successful, effective educational planner must be fully conversant with the needs of industrial and agricultural development, know the problems of foreign exchange and those relating to the terms of trade, be able to integrate all these basic factors with human resource development, and should never, under any circumstances, assume that he must be subordinate and subject to the whim and fancy of the general economic development planner.
Systems analysis approach
to human resource development planning
A logical starting-point

The 'manpower approach' to education planning has long been a subject for heated debate among educators and economic development planners. Actually, manpower analysis is a new and evolving art which employs diverse media and methods of expression, and thus its conceptual framework is not yet frozen, and its methodology is neither orthodox nor rigid. Free thinkers with creative ideas in the field are not yet smothered by technical purists insisting on rigorous but narrow forms of analysis. To be sure, there is widespread confusion about the nature and scope of the 'manpower approach'. Many of the working hypotheses underlying manpower analysis need to be revised or discarded, and new concepts should be introduced in the light of evolving experience.

The major thesis of this essay is that the manpower approach should encompass much more than a tabulation of 'heads and hands' in precise occupational categories. It must go far beyond the construction of purely quantitative forecasts, projections or targets for formal education. It should be related to a broad strategy of human resource development rather than to a narrow concept of education planning. Finally, one should discard the notion that manpower needs are derived solely from requirements for economic development. No developing country is interested merely in the growth of its economy—in increasing its national product or income. All have broader aspirations for social and political modernization. Thus, manpower and education planning should be related to national development—a term which encompasses economic, cultural, social and political development in the building of national identity and integrity.
Without questioning the usefulness and importance of the kind of quantitative analysis which is characteristic of most manpower surveys, it may now be appropriate to use in addition some of the concepts of systems analysis. It should be possible to look at the various constituent elements of human resource development as a system which is somewhat analogous to a system for the generation and distribution of electric power. In using this frame of reference, one can identify skill-generating centres, such as for example schools, universities, training institutes, and employing organizations, which develop people on the job. The linkages between such centres are analogous to transmission lines. The manpower problems encountered by developing countries such as skill shortages and labour surpluses may be thought of as attributable to power failures in particular generating centres, ineffective linkages between these centres, or faulty design which results in the failure of the total system to carry the loads expected of it. A system of human skill generation, like a system of electric power generation, should be designed to carry varying loads; it must have built-in flexibility to meet such loads; it must be adequate in size; and above all its components must be properly balanced. The systems analysis approach makes it easier to identify in operational terms major problem areas, and it compels the analyst to examine the critical interrelationships between various manpower and education programmes. It provides a logical starting-point for building a strategy of human resource development.

Human resource problems in developing economies

Let us now identify the major human resource problems in developing societies. They are: (a) rapidly growing population; (b) mounting unemployment in the modern sectors of the economy as well as widespread underemployment in traditional agriculture; (c) shortages of persons with critical skills and knowledge required for effective national development; (d) inadequate or under-developed organizations and institutions for mobilizing human effort; and (e) lack of incentives for persons to engage in certain kinds of activities which are vitally important for national development. There are obviously other major human resource development problems such as nutrition and health, but these lie for the most part in other technical fields and are beyond the scope of this work.

Most manpower and education planning experts agree on the fun-
damental importance of an analysis of population distribution and trends. It is particularly important to have some conception of the annual rate of population growth (and whether this rate is increasing or remaining constant), the age distribution of the population (with particular reference to those under 14 years of age), and the approximate size of the active population. Some calculation of the probable size and composition of the labour force is also essential, although with rare exceptions reliable labour force statistics are non-existent in most developing countries. Here it is important to distinguish between the labour force in the modern or monetized sector of the economy and that in the traditional sector.

In nearly all of the developing countries, one can assume that population is growing at rates in excess of 2 per cent per year, and in most it is climbing toward 3 per cent or more. This suggests that in most cases, at least two-fifths of the population is likely to be less than 14 years of age and hence not considered to be in the labour force. It also means that a high proportion of the population is of school age—a matter of great consequence for education planners.

The manpower analyst, of course, is particularly interested in the present and future size of the labour force, its growth rates in both the traditional and modern sectors, and the factors which determine labour force participation of various groups. Of necessity he must also be concerned with the consequences of policies to limit population growth. For example, a reduction in birth rates will not immediately lead to a reduction in the labour force, but at the same time it will probably increase a country's propensity to save and to invest in productive activities. Population control, therefore, in addition to its other obvious benefits, may contribute directly to greater labour productivity.¹ In the author's judgement, the human resource development strategist must now give closer attention to population problems and assume greater responsibility for proposing population control measures.

Mounting unemployment in urban areas is probably the most serious and intractable problem facing today's newly developing countries. Unemployment rates as high as 15 per cent of the labour force in the modern sectors are not uncommon, and even in rapidly industrializing countries, unemployment rates seem to be rising rather than falling. The reasons are fairly clear. Relatively high wages in the modern sectors act like a

magnet drawing persons away from the rural, agricultural areas. Primary education raises the aspirations of rural youth to escape from traditional agriculture into the modern sector. Jobless immigrants to the cities can be fed and housed for considerable periods by relatives who already have employment. And behind all of these factors is a rapidly swelling labour force resulting from ever-increasing population growth.

As a rule of thumb, the rate of increase in the labour force in the modern sector will exceed the rate of increase in population growth. Thus, if a country’s population is rising at 2.5 per cent annually, the increase in the labour force in the modern sector is likely to be 3.5 or even 4 per cent per year. On the other hand, the rate of increase in new employment opportunities is limited. At the very best, new jobs are created at a rate only half that of the increase in national income. Thus, if national income increases annually at a rate of 6 per cent, the highest possible increase in new jobs may be 3 per cent. Indeed, in most countries the rate of increase in new jobs is only a third of the rate of increase in national income, and in some, national income has increased substantially without any expansion of employment in the modern sector.

Unfortunately, greater investment and the building of more industries in the cities appear to aggravate rather than to alleviate the unemployment problem—the number of jobs increases, but the number of those seeking them increases even faster. The human resource development planner is thus faced with a dilemma: Where shall the surplus labour force be stored? Within the factories, by compelling employers to hire more workers than they need? Within the government establishment which is already overburdened with under-utilized personnel? In the urban ghettos and slums as ‘permanent visitors’ of employed relations? Or in traditional agriculture from which those with any education at all seek escape? The irony of this dilemma is that urban unemployment in newly developing countries is a consequence of modernization—a by-product of progress in lowering death rates, spreading education, investing in urban development, and building modern factories. Although he might wish that somehow or other the problem would ‘go away’, the human resource development planner cannot escape responsibility for considering ways and means of absorbing surplus manpower and directing it into productive activities.

The evaluation of occupational needs and skill-generating capacity has been a traditional concern of manpower specialists. Here, unlike the situation with unemployment, it is possible to suggest viable solutions for rather clearly defined problems. Manpower requirements can be deter-
mined; appropriate programmes of formal education and on-the-job training can be devised; and progress towards achievement of goals can be measured.

In setting targets for education and training programmes, the analyst is concerned with two related but distinct concepts—manpower requirements and absorptive capacity. 'Manpower requirements' may be defined as clearly evident needs for persons with particular education, training and experience. The assumption here is that such persons are necessary, if not indispensable, for achievement of a programme of national development. 'Absorptive capacity' is a looser term which refers to a country's capacity to provide some kind of useful employment for persons with certain educational qualifications. In effect, 'manpower requirements' should express minimum or essential needs; 'absorptive capacity' should express the maximum number of persons who can be employed without encountering redundancy or serious under-utilization of skill. The skill-generating centres, therefore, should produce trained manpower within the range between the maximum and the minimum; otherwise the skill generation system is distorted or unbalanced.

The demand for education or training must be distinguished from the allowable range between manpower requirements and absorptive capacity. Demand stems from social and political pressures for various kinds of education as well as from the willingness of people to pay fees to acquire it. Thus, for example, the demand for university education may be very high because of the status, prestige and pay enjoyed by graduates; but, in many countries this results in the production of graduates who cannot be effectively absorbed in the economy. When demand is clearly out of step with requirements or absorptive capacity, the country's educational system is clearly distorted or out of balance with the needs for national development. In using the systems analysis approach, a major task of the human resource planner is to detect actual and potential distortion and to consider measures for achieving a proper balance.

Another type of distortion in many countries is under-development, if not outright neglect, of appropriate measures of training persons in employment. A great deal of money is wasted in formal pre-employment craft or technical training which could be provided more efficiently and cheaply by employing establishments. Also the efficiency of skill-generating systems could be greatly improved by closer linkages between schools and universities and the employing institutions. For some reason, education planners have been inclined to think that on-the-job develop-
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ment lies beyond their legitimate concern, and at the same time they appear to have ignored the task of building the necessary bridges between formal education and in-service training. The systems analysis approach tends to highlight this under-developed area of concern.

In the past, manpower analysis has centred on measurement of needs for various categories of high-level manpower, and in doing so it has usually overlooked the vital problem of organization and institution building. Successful development requires the building of effective government organizations, private enterprises, agricultural extension forces, research institutions, producer and consumer co-operatives, education systems, and a host of other institutions which mobilize and direct human energy into useful channels. Organization is a factor of production, separate from labour, high-level manpower, capital or natural resources. The essence of organization is the co-ordinated effort of many persons towards common objectives. At the same time, the structure of organization is a hierarchy of superiors and subordinates in which the higher levels exercise authority over the lower levels.

The successful leaders of organizations, or more accurately the organization builders, are in any society a small, but aggressive minority committed to progress and change. They feed the aspirations, give expression to the goals, and shape the destinies of peoples. They play the principal roles on the stage of history, and they organize the march of the masses.

A major problem in many developing countries is organizational power failures. Often government ministries, commercial and industrial organizations, or educational institutions simply fail to 'deliver the goods'. Usually, the trouble may be traced to a dearth of prime movers of innovation.

Who then are these prime movers of innovation? Certainly the entrepreneur who perceives and exploits new business ventures belongs to this group, as does the manager or top administrator in public establishments. He may not always have new ideas of his own, but his function is to organize and stimulate the efforts of others. He structures organizations, and either infuses hierarchies with energy and vision or fetters them with chains of conformity. But effective organizations also need other creative people. The agronomist who discovers better measures of cultivation, and the agricultural assistants who teach the farmers to use them, belong to the innovator class, as do public health officers, nurses and medical assistants. Engineers are in essence designers of change, and engineering technicians and supervisors put the changes to work. And
last but not least, professors, teachers and administrators of educational institutions in many countries may constitute the largest group of prime movers of innovation, as they are the 'seed-corn' from which new generations of manpower will grow.

Some innovators are 'change-designers' who make new discoveries, suggest new methods of organization, and plan broad new strategies. Others are 'change-pushers' who are able to persuade, coach and inspire people to put new ideas to work. Some innovators, of course, are at the same time change-designers and change-pushers. But whether they are designers, pushers, or a combination of the two, the prime movers of innovation must have extensive knowledge and experience. Thus, for the most part, they are drawn from the ranks of high-level manpower. But they need more than proven intelligence and thorough technical training. They should have in addition keen curiosity, a capacity for self-discipline, and an unquenchable desire for accomplishment. They should be adept at asking questions. They should have the knack of stimulating others to produce ideas and to activate the ablest minds about them; and they should be able to sell ideas to superiors, subordinates, and associates. The prime mover of innovation must be convinced that change can occur as a result of individual action, and he must have the drive within him to bring it about. This may stem from a desire to rise in social status, to build up material wealth, to acquire political influence, or to preserve an already established prestige position.

Many of the persons holding commanding positions in organizations are conformists or even obstructors of innovation. They must be systematically replaced by more creative innovators. The human resource development planner should be able to locate the critical points of power loss in organizational structures and to suggest remedial measures.

A final problem area in human resource development is incentives. It is one thing to estimate the needs for manpower of various qualifications but quite another to induce persons to prepare for and engage in occupations which are most vital for national growth. In most developing countries, it is incorrect to assume that relative earnings and status reflect the value of the contribution of individuals to development. Pay and status are often more related to tradition, colonial heritage, and political pressures than to productivity. Characteristically, for example, the rewards of sub-professional personnel and technicians are far from sufficient to attract the numbers needed; the pay of teachers is often inadequate; the differentials in compensation between the agricultural officer and agricultural assistant are too great; and the earnings of
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scientists and engineers, in comparison with administrative bureaucrats in government ministries, are too low. The preferences for urban living, the forces of tradition, and historical differentials all tend to distort the market for critical skills. It follows then that the demand for certain kinds of education, particularly at the university level, is inflated relative to the country's absorptive capacity. The human resource development planner must therefore consider deliberate measures to influence the allocation of manpower into high-priority activities and occupations. Such measures may include major changes in the wage and salary structure, scholarship support for particular kinds of education and training, removal of barriers against upward mobility, and in some cases outright compulsion. As many developing countries have learned to their chagrin, investments in education can be wasted unless men and women have the will to prepare for and engage in those activities which are most critically needed for national development.

These then are the problems and tasks which face the human resource development planner—the consequences of population increases and the measures for controlling them; underemployment and unemployment in both the traditional and modern sectors; skill shortages and the processes of developing high-level manpower to overcome them; organizational weakness and the need to find prime movers of innovation for institutional development; and provision of both financial and non-financial incentives in order to direct critically needed manpower into productive channels. Some of these are subject to quantitative analysis; others are purely qualitative; and a few are subject only to intuitive judgment. But, they are all interrelated. The systems approach forces the analyst to look at them as a whole as he searches for the weak spots—the points of power failure or the major areas of distortion—in a country's over-all effort to effectively develop and utilize its human resources.

This approach in reality is not new; it is little more than a logical framework for looking at problems which are almost blindingly obvious to those concerned with development problems.

Conclusions

The systems analysis approach used in this work does not suggest that the more traditional manpower surveys are outmoded. On the contrary, it assumes that they must be made in order to arrive at a first approxi-
mation of manpower requirements. The systems approach, however, goes beyond traditional manpower requirements analysis by examining operational relationships between a broad range of factors involved in human resources development. It forces the analyst to take a broad view of education planning and to examine its relationship to an even broader area of in-service development of skills and knowledge. It stresses the identification of causes of power failure and structural faults in design of skill-generating institutions. It is a way of looking at elements as functional parts of an over-all constellation. It is, in effect, an attempt to apply the principles of balanced growth to the field of human resource development.

The use of this approach may lead us to question some of the concepts and slogans which often were employed in the past. In conclusion, a few of them can be mentioned.

First, there is the notion that all developing countries should increase the proportion of their resources devoted to education. Actually, there is no clear-cut causal relationship between the volume of investment in education and successful national development. Indeed, under some circumstances, education of the wrong kind may impede growth. And poorly balanced educational systems can and do waste resources which could be used more productively for other purposes.

Second, there is the idea that human resource development planning should be integrated with and subordinated to economic development planning. To be sure, manpower requirements can be derived in some cases from sectoral growth plans. But manpower considerations—such as, for example, unemployment—may necessitate major changes in emphasis and orientation of the entire programme for economic development. It is, therefore, often just as logical in national planning to start with a broad plan or strategy of development and utilization of human resources as to begin with a plan to maximize economic growth. In other words, we might consider whether economic planning should be integrated with human resource planning rather than vice versa.

Finally, we should question the widely held belief that aid to the developing countries for human resource development is always beneficial. For example, some kinds of external aid for development of secondary and university education can seriously distort skill-generating systems. More often, the ultimate cost consequences of pilot or demonstration projects financed by well-meaning donors are overlooked, thus committing the recipient countries to programmes which they cannot afford. And some programmes of student fellowships and exchanges may cause
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a major drain of precious brainpower from the less developed to the more advanced countries.

The urgent need in the human resources area is for comprehensive planning based upon an integrated examination of all major constituent elements. In that case, the systems analysis approach could make a significant contribution.
Suggestions for further reading


Myers, C. N. *Education and national development in Mexico*. Princeton, Industrial Relations Section, Princeton University, 1965.


The following books, published by Unesco/IIEP, are obtainable from the Institute or from Unesco and its national distributors throughout the world:

*Educational development in Africa* (1969. Three volumes, containing eleven African research monographs)

*Educational planning: a bibliography* (1964)

*Educational planning: a directory of training and research institutions* (1968)

*Educational planning: an inventory of major research needs* (1965)

*Educational planning in the USSR* (1968)

*Fundamentals of educational planning* (series of booklets: full current list available on request)

*Manpower aspects of educational planning* (1968)

*Methodologies of educational planning for developing countries* by J. D. Chesswas (1969)

*Monographies africaines* (five titles, in French only: list available on request)

*New educational media in action: case studies for planners* (1967. Three volumes)

*The new media: memo to educational planners* by W. Schramm, P. H. Coombs, F. Kahnert, J. Lyle (1967. A report including analytical conclusions based on the above three volumes of case studies)

*Problems and strategies of educational planning: lessons from Latin America* (1965)

*Qualitative aspects of educational planning* (1969)

The following books, produced in but not published by the Institute, are obtainable through normal bookselling channels:

*Quantitative methodologies of educational planning* by Héctor Correa
  Published by International Textbook Co., Scranton, Pa., 1969

*The world educational crisis: a systems analysis* by Philip H. Coombs
  Published by Oxford University Press, New York, London and Toronto, 1968
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