CONFERENCE OF AFRICAN PLANNERS

First Session

Dakar, 16 – 27 November 1964

THE ROLE OF EDUCATION IN ECONOMIC DEVELOPMENT

by

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1. - EDUCATION: CONSUMPTION OR INVESTMENT

Some economists see education mainly in its "consumption" aspect. In their view it is a public service, often a very costly one, and it is part of "overhead costs" of development. Seen in this light, educational expenditure ought to be confined within as narrow limits as possible so that productive investment shall not be handicapped. This standpoint is somewhat reflected in the structure of national accounting. In fact, in national accounts only the expenditure financing fixed capital formation (building construction, equipment etc.) and the variation of stocks, is reckoned as investment. All expenditure having another purpose is held to be consumption expenditure. Thus, according to the criteria of national accounting, only that part of educational expenditure used for the acquisition of immovable property, such as school buildings, would come within the investment calculation. The recurrent expenditures which constitute the major part of educational costs are, on the other hand, counted under the heading "consumption".

Now, economic theory lays very great stress on the role of the rate of investment as a motive force of growth. The effect on income of an increase in capital, or the amount of capital required to obtain a given increase in income, is measured by the marginal or incremental capital-output ratio. The more favourable the structure of the capital, the higher will be the increase in national income following upon an increase in capital. It will be regarded as favourable if the highly-productive investments, hence with a low capital output ratio, such as equipment and machinery, are greater than the investments with a high capital-output ratio and hence with low productivity, such as building construction.

From this standpoint the human factor is viewed in its negative aspect. The rapid population increase necessitates additional investment and accentuates the shortage of capital
in the developing countries. Indeed, in these countries one of the most difficult "vicious circles" to break is assumed to be that of capital/income. To increase income it is necessary to invest and hence, if inflation is to be avoided, to save; but the propensity to save is low when income is low. In such case foreign aid would seem indispensable. Now, a population that is increasing at an annual rate of 25 per thousand, for example must invest 7.5% of its income, assuming that the marginal capital-output ration is 3, simply in order to maintain the level of income per capital. Furthermore, the increase in the number of dependent persons following upon a rise in the birth rate will involve an increase in what is called social expenditure, reckoned as unproductive.

Of course the strategic role of capital in economic development cannot be questioned. But to consider only the investment expenditure appearing in the national accounts under the heading "capital formation" as productive is in a way to ignore reality. This argument assumes that production is a function of only one factor. But labour is a factor of production on the same footing as capital, and has a productivity of its own.

Labour productivity is usually represented in an enterprise, a sector or the economy as a whole by the ratio O/L in which L is labour (often measured in man-hours) and O is the output or value added (expressed in monetary units or in real terms). This measurement in average terms assumes that the role of labour is somewhat passive, and that the labour units are interchangeable. It also makes labour productivity depend on the amount of capital available. For example the mechanization of agriculture will increase labour productivity as expressed by the ratio O/L, but this increase is attributed to the increase in capital.

Actually, in a function in which output is assumed to depend on two variables, capital and labour for instance, the natural or intrinsic productivity of labour is measured by its marginal productivity, which is the partial derivative of the function, the other variable remaining constant.
Thus, irrespective of any variation in the capital, an increase in the marginal productivity of labour can engender an increase in output.

Therefore the expenditure connected with various actions tending to increase the marginal productivity of workers cannot be regarded as mere consumption. It becomes, at least partly, an investment in the wide sense of the term, even if it is not an investment from the viewpoint of national accounting criteria.

There are many types of action to enhance the marginal productivity of labour. We may mention education, training, health, the improvement of nutrition, etc...

However, to say that education can be a profitable investment is perhaps not a very original proposition or one of great operational value. Are all types of education equally profitable? Are there not some forms of education that are solely consumption? How far is it possible to differentiate between the consumer aspect and the investment aspect in education?

II. - MEASURING THE PROFITABILITY OF EDUCATIONAL EXPENDITURE

Attempts have been made to measure the returns to "investment in education". Such measurements would be of great use in economic trading, since they would make it possible to pick out not profitable types and forms of education and to compare the advantages of an investment in education with an investment of the classical type. At least three approaches have been made in connexion with these measurements.

1. - The differential wages approach

As Bowen (1) points out, this method is deceptively simple. It consists of comparing the differences in the net earnings of persons having various education levels and of deriving a

rate of interest or of profitability for the educational expenditure at each level. The calculation is made on two levels, first on the individual level and then on the collective level.

At the individual level the net earnings are assessed by deducting the cost of education from the total of wages and incomes received during working life.

However, in order to make this deduction, we have to "capitalize" the cost and "discount" the earnings. The choice of the rate of interest to be applied will not be easy and will have a great effect on the results. Moreover, should earnings forgone be included in the cost? This would seem to be necessary at the individual level. Should we not also deduct from the cost the proportion of education which comes under consumption? But it is not easy to make this distinction between the consumption aspect and the investment aspect of a given type of education, and we are forced to make assumptions in this connexion. For example, T. Schultz (1) assumed that a proportion of 50% represented the consumption aspect of education; consequently he halved the cost in his calculations.

At the macro-economic level, the calculation becomes even more complicated. The wage is not always closely related to the educational level. Individual capacity enters into it. Two persons holding the same university degrees at the same time will probably receive different remunerations during their working life. Others will have their activity prematurely interrupted by death. Besides, is the wage an exact measurement of economic productivity? This may well be doubted. We often observe; on the one hand, rises in wages irrespective of an increase in productivity, while increased productivity may sometimes be reflected

in an increase in the return on capital or in a lowering of prices to the benefit of consumers. Everything will depend on the markets structure. In some occupations we find quasi-monopolistic situations, while in others it is rather a competitive situation which predominates.

Should the earnings forgone which are included in the cost at the individual level be included at the collective level? Views on this subject are divided. However, it would seem advisable to disregard them, as they are not taken into consideration in the calculation of national income.

The differential wages approach also leaves out a very important factor represented by all the indirect effects of education.

Basing his approach on differential wages, G. Becker in the United States evaluated the rate of return on educational expenditure at 9% for a white university graduate as of 1950, which rate compares favourably with the yield on physical capital evaluated at 8% (1). For his part S. Strumilin has noted, on the basis of the differences in wage levels in the USSR, that "after four years' primary studies a worker has an output and a wage 79% higher than those of a worker in the first category who has had no schooling, after seven years' studies an employee can have a skill worth 235% of the lowest level, this improvement can go up to 260% after nine years' schooling and 320% after fourteen years' studies" (2).

However, we do not feel that calculating the profitability of education by the differential wages approach - already a hazardous one - is of great use for the peculiar structures of the developing economies. In the latter, especially the African countries south of the Sahara, the link between productivity and wage levels is a very loose one, especially in the administrative sector which is a large employer of manpower, and in certain undertakings in which the maximization of profit is not the main

In the developing countries, the problem is not so much to assess the profitability of the various forms of education within the existing structures, as to bring about a transformation of these structures so that the types of education which the country needs may become more profitable for the individual.

2. - The residual analysis approach

This method tries to identify, in the production function, the contribution of each "input" to growth. The "inputs" taken into account are not only the traditional factors: capital and labour, but also what has been called the residual factor, in which education is included.

The chief work done in this field, for instance that of Denison (1), attributes a significant role to raising the productivity of labour and to education.

While this approach has the merit of confirming, and sometimes of measuring, the contribution that education makes to growth, it regards education as a whole and does not make it possible to judge the merits of each type and form of education.

3. - The correlation approach

The profitability of education is here measured by finding correlation coefficients between indicators relating to school attendance and others relating to the GDP (or GNP). But there are several difficulties which arise. For example, a correlation between educational expenditure and income levels must take unit costs into account. It is also susceptible of two interpretations. Is income high because more has been spent on education, or is it because income is high that the educational expenditure has increased? Another tricky point is that of time-lags. The effect of an increase in educational expenditure in year t for example must not be sought in the income of the same year, but in that of several years (corresponding to the length of a normal working life) occurring m years after year t (m corresponding

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to the average length of "gestation" of educational investment).

It remains true that the correlation approach has made it possible to ascertain an important result: an increase in educational expenditure or an increase in the numbers attending school and university is a necessary, but not a sufficient condition for a rise in income. This rise will only come about if teaching, and education in general are quantitatively and qualitatively adapted to the country's needs, and, naturally, provided that the other factors in development are favourable.

III. EDUCATION IN THE DEVELOPING COUNTRIES

1. The size of educational expenditure

The developing countries, particularly the African countries south of the Sahara, are lagging greatly behind in the field of education. This backwardness is especially noticeable at the level of post-primary education, where the numbers of graduates are usually far below than the needs. But even primary education is still far from reaching all the population of school age.

Yet it is interesting to note that, despite this low educational coverage the educational expenditure in those countries is by no means negligible in relation to their resources. According to a paper submitted to the Conference of African Ministers of Education which was held recently at Abidjan (1), the proportion of public expenditure on education in relation to gross domestic product or gross national product, whichever was used, amounted in 1962 to

<table>
<thead>
<tr>
<th>Anglophone countries</th>
<th>Francophone countries</th>
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</thead>
<tbody>
<tr>
<td>Gambia</td>
<td>Congo (Brazza)</td>
</tr>
<tr>
<td>Ghana</td>
<td>Dahomey</td>
</tr>
<tr>
<td>Uganda</td>
<td>Senegal</td>
</tr>
<tr>
<td>Sudan</td>
<td>Mauritania</td>
</tr>
<tr>
<td>Kenya</td>
<td>Ivory Coast</td>
</tr>
<tr>
<td>Tanganyika</td>
<td>Cameroone</td>
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<tr>
<td>5.0 %</td>
<td>4.2 %</td>
</tr>
<tr>
<td>4.4 %</td>
<td>3.8 %</td>
</tr>
<tr>
<td>4.1 %</td>
<td>3.8 %</td>
</tr>
<tr>
<td>4.0 %</td>
<td>3.7 %</td>
</tr>
<tr>
<td>3.8 %</td>
<td>3.3 %</td>
</tr>
<tr>
<td>3.0 %</td>
<td>2.7 %</td>
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</tbody>
</table>

(1) Unesco AFMIN/5
It should be pointed out that the figures for the francophone countries are under-estimated, mainly owing to the non-inclusion of the foreign aid used for remuneration of technical assistance teaching staff.

Although the total resources allocated to education in the industrialized countries are of course not comparable in absolute terms to those allocated by the developing countries, the relative impact on the economy is frequently not much less great than in the latter countries.

According to Professor Edding's calculations (1) submitted to the Conference of the International Economic Association on the Economics of Education (France 1963), the percentage of educational expenditure (probably public and private) in relation to national income was, in 1960:

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Australia</td>
<td>3.49 %</td>
</tr>
<tr>
<td>France</td>
<td>3.50 %</td>
</tr>
<tr>
<td>Federal Germany</td>
<td>3.79 %</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>4.41 % (1959)</td>
</tr>
<tr>
<td>Denmark</td>
<td>4.5 %</td>
</tr>
<tr>
<td>Sweden</td>
<td>5.02 %</td>
</tr>
<tr>
<td>Japan</td>
<td>5.34 %</td>
</tr>
<tr>
<td>USA</td>
<td>6.19 %</td>
</tr>
</tbody>
</table>

The large relative size of educational expenditure in the African countries can of course be explained by their low incomes; but also by the level of the salaries of teaching staff which is several times greater than the average income per capita, this being the opposite of what occurs in the "developed" countries.

It is highly probable that the rate of increase of educational expenditure in most African countries will rise more rapidly than the rate of increase of the national (or domestic) income, that is, an increasing proportion of their resources will be allotted to education. It is generally felt, as we have mentioned, that a mere increase in school attendance or in educational expenditure will not automatically secure the desired economic development. The educational system must be adapted to the needs of the specific

(1) Quoted by K. Bahr, IDEP Cairo course
structures of these countries, so that the efforts made are fruitful and do not end in wastage at a time when there is an imperative need to mobilize all resources.

How can education operate on the structures of the developing economies? Under what conditions can its action help these economies to achieve their "take-off"?

2: Favourable effects of education on the structures of the developing countries

a) Direct action: the training of manpower

The developing countries have to face a serious problem. On the one hand they usually have a surplus of unskilled labour, but on the other hand they have a great shortage of skilled manpower, and this constitutes a serious bottleneck. These countries have to modernize their agriculture but at the same time embark upon an industrialization which must take into account the availability of natural resources, the existence of markets etc...

Industrialization, if carried out according to judiciously chosen criteria, will reduce vulnerability to fluctuations in the terms of trade and will help to raise incomes appreciably. The developing countries must also modernize their distribution network, improve the economic infrastructure, organize the civil service, etc...

All these problems cannot be solved without qualified manpower at all levels and in all sectors. Agricultural productivity cannot be raised in the absence of instructors, at various levels, and engineers, who devise or implement the extension programmes, and in the absence of farmers equipped with a training which enables them to understand and apply the new techniques. Industrialization presupposes the existence of a whole range of qualified personnel: skilled workmen, foremen, accountants, engineers, supervisory administrative staff at all levels? What is true for industry is equally true for the public services and administration.
If the developing countries are to maximize yields in the field of trade and transport, avoid wastages and set up modern networks, they will need to have well-trained cadres available. In an administration where many posts are often filled by people who do not have the requisite standard, and where foreign technicians sometimes take decisions concerning a country which they may not know well, it is essential to ensure the availability of qualified persons from the modest ledger clerk up to the officials responsible for policy and decision-making.

To obtain all this quantity of skilled personnel which the economy so greatly needs in order to improve the efficiency of the existing enterprises and above all to be able to establish new production units, we have to resort mainly to the educational system. Although on-the-job training, leading to internal promotion and vocational training, help to reinforce the supply of manpower, they can only constitute a valuable auxiliary contribution to the educational system, which has to supply, in adequate quantities and of the best quality, the bulk of the labour force needed by the economic machinery. In any case most kinds of vocational training can only be carried out after a prior school training.

b) **Indirect action: the creation of conditions favourable to development**

Even in purely economic terms, the role of education cannot consist solely in training the requisite manpower. The state of under-development is not related solely to economic conditions, it is bound up with certain attitudes of mind, with a psychological climate unfavourable to the necessary changes. The farmer for example must want to change his living conditions and to act in consequence, he must consent to sow the subsistence produce after the export crops, as is appropriate in some countries; he must facilitate the extension of the monetary sector as opposed to exchanges in kind. The acquisition of the rational spirit, the struggle against the fatalism and superstitions in which many inhabitants of developing countries
are plunged, are necessary to start the "take-off".

An educational system suitably oriented as to its content and spirit is likely to make a powerful contribution towards overcoming resistances, galvanizing energies and inculcating new ideas. It will also help to limit population growth, since it is very difficult to introduce contraceptive methods in an illiterate environment where the people's ideas make them reluctant to accept such an undertaking.

Education can also promote monetary savings and especially its institutionalized collection. The introduction of saving books, of postal check accounts, of treasury bills or bonds is greatly facilitated in an educated environment where the utility of such operations is understood.

Education is also necessary for the establishment of a class of entrepreneurs, particularly in countries where it is desired to entrust private initiative at least with the task of carrying out productive investment.

Moreover, the role of education is not confined to transmitting known methods and techniques, but it is also to contribute, by means of research, to the creation of new techniques and new methods.

It is not necessary to stress here the well-known role played by research in technological and economic progress, especially in the contemporary period. Inventions and innovations have radically altered the conditions of life in the industrialized countries. In the developing countries, research is still in its early stages or frequently non-existent. It cannot, of course, provide sensational results in this field in the near future. However, research can be extremely useful for an attempt to adapt the techniques which have proved themselves in the industrialized countries to the specific conditions of each developing country.

3. - Unfavourable effects?

We have just mentioned the favourable effects which education can and must have on economic development, in the form of the
training of the skilled manpower required and the creation of conditions of all kinds conducive to development. Nevertheless the extension of education in a country will not automatically produce a favourable effect. An educational system can sometimes be traditionalist and conservative. It will then be used to strengthen rather than to break down the psychological and sociological resistances to development. It may also be unsuitable for the realities of the country as to its content, its structure and its methods. It may, for example, tend to form a bureaucratic outlook, to arouse contempt for manual work or accentuate an excessive migration to towns which would empty the countryside of its most vigorous elements.

As regards the training of manpower, the educational system may sometimes get on the wrong track. We have indeed seen countries which are faced with an "overproduction" of graduates in some fields and a serious shortage in other more important ones. For example the graduates of faculties of letters in some countries of Latin America, Asia or the Middle East are usually excessively numerous, while these countries are facing a shortage of technical personnel.

In some cases also there is a danger that education may fritter away savings by inculcating habits, of conspicuous consumption into the inhabitants of developing countries.

In sum, it seems that education could be a profitable investment hence the need and utility of rational planning in this field, planning which must fit into the overall economic planning and which involves making choices and arbitrations. The techniques and methods of such planning cannot be dealt with in this study.