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9. ABSTRACT

A very broad definition of education is used in this paper. It has three major components.;First, formal education at primary, secondary and higher levels consisting for the most part of age-specific, graded, pre-employment schooling; second, non-formal education consisting mainly of organized out-of-school education and training programs; and third, work-related skill and knowledge generation consisting mainly of training-on-the-job which is an integral component of all working environments. Thus education, as conceived in this paper, encompasses a broad range of learning opportunities and programs. In this context, an education system is more aptly called a "nation-wide learning system".

The nation-wide learning system thus is a mixture of formal schooling, nonformal education, and work-related skill acquisition. These three kinds of learning opportunity have an impact on income distribution. More specifically, they may increase the mobility of individuals from lower to higher income groups; they may alleviate or aggravate low-end poverty; and they may increase or decrease disparities in income between the rich and the poor.

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THE CONNECTION BETWEEN EDUCATION AND INCOME DISTRIBUTION

Prepared for
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Education: A Nation-Wide Learning System

A very broad definition of education is used in this paper. It has three major components. ;First, formal education at primary, secondary and higher levels consisting for the most part of age-specific, graded, pre-employment schooling; second, nonformal education consisting mainly of organized out-of-school education and training programs; and third, work-related skill and knowledge generation consisting mainly of training-on-the-job which is an integral component of all working environments. Thus education, as conceived in this paper, encompasses a broad range of learning opportunities and programs. In this context, an education system is more aptly called a "nation-wide learning system."

Formal education performs many functions. It enriches human life; it builds consensus on values which condition attitudes toward work, cooperation, and nationhood; and it can become an instrument of indoctrination. Its main economic functions are to develop the skills, knowledge and capacities of people for participation in the labor force and to serve as a selection system. Formal education thus is a means of human capital formation, and at the same time acts as a giant sorting machine which determines access to positions of status, wealth and power. In all developing countries, formal education is a big industry; it employs more people than other government services, and consumes a very large proportion of public expenditures. The administration and control of formal schooling is usually lodged in a single ministry of education.

Nonformal education is more difficult to define. It consists of a heterogeneous conglomeration of seemingly unrelated learning programs with a wide variety of objectives. It is the responsibility of no single ministry; administration and control of its programs are widely diffused throughout both the

public and private sectors. In this paper we deal with only a few of the better known out-of-school programs which provide important productive learning opportunities. These are agricultural extension, rural multiple-purpose training centers, work-oriented literacy programs, urban trade training and testing centers, payroll-tax supported training organizations and nutrition-health information programs.

These six nonformal programs have several common denominators: First, they are organized activities for which funds are allocated to develop specific skills; second, they lie outside of the control of ministries of education; and, third, in some respects they provide unique learning opportunities, but in others they also provide alternatives to and or extensions of formal education. Many other important learning services (such as for example, radio, television and other mass media, activities of churchs, village polytechnics, and community development projects) could be included in this analysis if time and space permitted.

The third category of learning activities is work-oriented skill and knowledge development. This takes place routinely and often unconsciously through learning-by-doing, instruction or inspiration from others, association with peers or fellow workers, or simply participating in a working environment. Here the process of human capital formation is for the most part inseparable from the process of production of goods and services. Most work-related learning is a response to practical needs. As a rule, working environments develop the skills and knowledge which they require. In primitive subsistence agriculture, for example, simple skills are handed down from father to son. In modern sector agriculture, farmers and workers receive specific instruction and supervision (training) in the use of fertilizers, insecticides, water use, planting, cultivating, and handling of crops. In a modern-sector factory, specific on-the-job training is given operators, and most skilled craftsmen learn their trades on-the-job. Automobile mechanics in Nigeria and other

African countries learn their trade in small garages or in the larger service shops of the automobile distributors. Most of this learning takes place automatically without specific allocations of resources.

The nation-wide learning system thus is a mixture of formal schooling, nonformal education, and work-related skill acquisition. These three kinds of learning opportunity have an impact on income distribution. More specifically, they may increase the mobility of individuals from lower to higher income groups; they may alleviate or aggravate low-end poverty; and they may increase or decrease disparities in income between the rich and the poor.

Formal Education and Income Distribution

Formal education encompasses the complex of primary, secondary and vocational schools as well as technical institutions, colleges and universities. It connotes age-specific, full-time classroom attendance in a linear graded system geared to certificates, diplomas, degrees and other recognizable credentials. It is associated mostly with "the school-age population," and it concentrates on pre-employment preparation of future members of the labor force. In most developing countries the orientation of formal education is toward more education. Success at each level is measured by passing tests and gaining access to the next level. Since the university is at the apex of the formal education system, entry into and completion of higher education are the supreme goals which dominate the entire system. The university thus casts its shadow over every branch and level of education. Those who "make it" through the university hold the required entry passes for admission to the more prestigious positions in the modern sector enclaves, and those who "don't make it" are, in varying degrees, selected out as failures along the way by this educational screening process.*

*For a further analysis of formal education, see Frederick H. Harbison, Human Resources as the Wealth of Nations, New York: Oxford University Press, 1973, chapter 3.

Without any question, formal education is an avenue through which some members of low-income groups gain access to the higher-income occupations. The son of a subsistence farmer may reach the higher levels of a government bureaucracy if he is fortunate enough to have had the right levels of schooling. Poor parents in developing countries often invest their meager resources in the education of one of their children who appears most likely to successfully climb the schooling ladder. Even in the most remote rural areas, the aspiration of poor families is to have their offspring "get book" (primary education) or "big book" (higher education) so that they may escape a life-sentence to traditional agriculture. And in many countries, government aid is available for a small number of poor students up to and including full-support in high-quality universities. In short, a few fortunate children of the poor have risen to riches, and more may do so as educational opportunities are expanded.

However, in many of the less developed countries, large numbers of children have no access at all to primary schooling. In some countries this is the plight of the majority of the school-age population; in many more well over a quarter have no access to schooling. And if we look at the disparities within particular countries, the situation is even more distressing. In Colombia, for example, which is one of the more advanced of the less-developed countries, nearly 60 percent of the rural schools offer no more than the first two grades of primary school; only 6 percent have facilities to offer the four-year primary sequence.* In Kenya about 80-85 percent of the relevant age children in the

*International Labour Office, Towards Full Employment, A Programme for Colombia, Geneva: 1970, p. 219.

more advanced Central Province attend primary school; but in several other districts and provinces, the rate may be as low as 35 percent.** In Mexico

**International Labour Office, Employment, Incomes, and Equality, A Strategy for Increasing Productive Employment in Kenya, Geneva: 1972, p. 511.

the percent of the population which has completed four or more years of schooling is strikingly higher in the Federal District (Mexico City) -- 60.6 -- than in the rural states such as, for example, Chiapas (11.3) Guerrero (9.8) and Oaxaca (11.9).*

*Harbison, Maruhnic, and Resnick, Quantitative Analyses of Modernization and Development, Princeton, New Jersey: Industrial Relations Section, Princeton University, 1970, Appendix VIII.B.

Thus, in the developing countries there are millions of children of elementary school-age who are not currently in school; there will be millions more yet-unborn who may never gain access even to the most elementary formal schooling. The avenues of upward mobility provided by formal schooling are effectively closed to vast numbers of children; these avenues become progressively more narrow as one climbs the academic ladder; and thus the opportunities for movement into good occupations in the modern sector are sharply limited. In this respect, children in the rural subsistence sector are much worse off than those in the urban traditional sector who at least are located near the centers of schooling. Nevertheless, the tremendous pressure for universal primary education, a goal not likely to be attained by many developing countries in this century, is grounded in the belief that schooling can and will provide every child with some opportunity to move out of poverty into the better life in the modern sectors.

It is doubtful whether formal education can do much to alleviate low-end poverty. The major objective of primary schooling is to prepare pupils to qualify for higher levels of education. It does not claim to generate specific skills for the labor market. In the poorer areas, parents, students and teachers think of education as a route of escape from the local environment rather than as a means of making it more productive. Thus, a massive drive to extend primary school to traditional rural areas might simply raise levels of frustration rather than

levels of living, unless it were accompanied by other measures beyond education to provide opportunities for raising income levels of the poor. And experience has also demonstrated that literacy, although helpful, is by no means a prerequisite for generation of skills required to take advantage of such opportunities.

The question of whether formal schooling increases or decreases income gaps between individuals and groups is more complex. Here it is necessary to look at the pattern of expenditures on formal education, the allocation of educational opportunity, and the ways in which formal education is financed.

Fortunately in many countries there is some data on public outlays, enrollments, and per student expenditures on formal education. In the annex to this paper, Joan Maruhnic has presented relevant statistics for a sample of 30 countries - 10 more advanced and 20 less developed - which were selected on the basis of their representative nature as well as availability of data. Although the data itself in the annex should be examined with care, we list here some of the more important findings:

1. Most developing countries devote a substantial proportion of GNP to education. Although there is wide variation between individual countries, the less developed appear to spend on education about the same proportion of GNP as do the more advanced. The medians and ranges of public recurrent expenditures on education as percent of GNP in the two groups are (see Appendix Table 1):

	median	range
more advanced:	4.5	(1.4 - 7.9)
less developed:	3.6	(1.3 - 5.6)

In most countries the proportion of GNP going to education has been increasing in the past decade.* In our sample, this has been true of 7 out of

*This is also supported by data in Harbison Maruhnic and Resnick, op. cit., chapter 7.

10 more advanced countries and 15 out of 18 of the less developed.

2. The less developed countries, in contrast to the more advanced, appear to allocate greater proportions of total public expenditures to higher education (see Appendix Table 2):

	3rd level education	
	median	range
more advanced:	15.5	(6.6 - 30.2)
less developed:	18.5	(1.8 - 54.5)

3. The proportion of students in secondary, and particularly higher education, is much smaller in the less developed than in the more advanced countries (see Appendix Table 2);

	2nd level education		3rd level education	
	median	range	median	range
more advanced:	29.4	(13.5 - 47.5)	6.0	(3.0 - 12.7)
less developed:	15.0	(4.5 - 28.5)	1.7	(0 - 3.8)

4. The ratio of the percentage of total public expenditures on higher education to the percentage of students at that level is much higher in the less developed than in the more advanced countries (see Appendix Table 2):

	3rd level education	
	median	range
more advanced:	2.7	(1.10 - 4.3)
less developed:	11.6	(3.50 - 76.7)

In African countries, this ratio seems to be exceptionally high. In Ghana, for example, it is 83.7 and in Ethiopia it is 61.7.

5. In the less developed countries the annual per-student expenditures on secondary, and particularly higher education, are proportionately much higher than in the more advanced. Using primary as a base index of one, the medians and ranges for secondary ahd higher education are given (see Appendix Table 4):

	2nd level education		3rd level education	
	median	range	median	range
more advanced:	1.7	(1.03 - 3.1)	5.7	(2.1 - 9.8)
less developed:	3.5	(1.04 - 12.2)	18.6	(7.2 - 155.6)

Thus, in the developing countries students in higher education receive relatively high benefits in the form of public recurrent expenditures on education. To a somewhat lesser extent, those in secondary education also receive very high benefits. The same conclusion would also hold if public capital expenditures were also included. The extent to which their benefits (expressed in public monies spent on their education) exceed their contributions or those of their parents is more difficult to estimate. It is probable that students in higher education tend to come from the richer families, because the prerequisite secondary education often involves expenses in the form of fees and foregone earnings. It is possible also that their parents contribute considerable amounts to their education, and thus may pay for a substantial proportion of it. But, it is clear that the students in higher education receive the lion's share of public expenditures as well. Their critical advantage, however, is that their education provides them with entry passes into the higher paying occupations, and in this respect widens the ultimate income gap between them and the less educated masses.

Up to now we have been concerned primarily with the allocation of opportunities for schooling. The disparities appear to be enormous. But, to determine the total impact on income distribution it is also necessary to examine how education and other learning services are financed. In developing countries unfortunately, it is extremely difficult to get hard facts on the incidence of taxation, fees paid by students for education, and sources of funding for private schooling. With perhaps only one exception (which is discussed below) estimates of the distribution of the burden for financing learning services are a matter of guesswork in nearly all developing countries.

It is probably reasonable to conclude that the greater part of support for formal education comes from public sources. Yet, the proportion supplied from private sources may be larger than is generally recognized. In many countries parents pay some fees for primary education. In a few, secondary education may be provided largely by fee-charging private schools. Although most higher education is public, there are some private universities which charge tuition. And missionary organizations, foundations, and private businesses contribute to the support of educational institutions in many developing countries. Finally, in theory at least, foregone earnings of students in school should be counted as part of the cost of education. Indeed, in higher education, such opportunity costs usually exceed the direct costs of schooling, and thus persons who are studying full-time instead of working are in effect paying for much of their education.

Jean-Pierre Jallade of IBRD has made a pioneering and exhaustive study of public expenditures for formal education and their impact on income distribution in Colombia, and his work may be a model for further research in this area.*

*Jean-Pierre Jallade, Public Expenditures on Education and Income Distribution in Colombia, Washington, D.C.: Education Dept., Central Projects Staff, IBRD April 1973 (mimeo).

He concludes that the public financing of primary education actually redistributes income from the 13 percent richer families to the 87 percent poorer families and that the redistributive effect is particularly beneficial to the 40 percent poorest families, most of whom live in rural areas. In the case of secondary education, the main beneficiaries are middle income groups comprising a little less than 50 percent of all families. As he points out, "the public financing of secondary education redistributes income from both the 40 percent poorest and the 13 percent richest families to a sort of lower middle-class, 80 percent of which are living in urban areas...." The situation for higher

education is much the same except that the middle income groups subsidized both by the poor and by the rich are higher up on the income scale, and are almost exclusively urban dwellers. All in all, he concludes that aggregate public expenditures for education in Colombia have the effect of distributing income from the rich to the poorer classes, but most of this is attributable to the financing of primary education.

It would be dangerous, however, to generalize from Jallade's analysis of Colombia. In the first place, Colombia spends a smaller proportion of its public funds on higher education than other countries, for instance Brazil and Chile (see Appendix Table 2). If it spent more, Jallade's conclusions might be quite different - showing relatively greater benefits for the rich. Second, the larger part of secondary education in Colombia is provided by private, fee-charging schools. This is not the case in most developing countries. Thus, we have a rather unique situation in Colombia where those who are relatively rich pay an unusually high proportion of the costs of education for their children. Third, Jallade's analysis concentrates on benefits received by those having some access to formal schooling; it does not take into consideration the non-benefits of those who never enter a classroom. Thus, studies in other countries, taking these factors into consideration, might reach quite different conclusions.

A major difficulty in all attempts to study the education-income connection is the estimation of the benefits of schooling. One method is to measure the value of schooling in terms of expenditures per student or total expenditures for schooling for a certain income group or class. Then the net benefit is calculated as the total expenditure per individual or group minus contributions in the form of taxes or payment of fees. This is the method used by Jallade in his study of Colombia. Most economists would argue, however, that, if appropriate data is available, benefits should be calculated on the basis of returns to investment in schooling as well as access to employment opportunities.

Using a somewhat different approach from Jallade, Bhagwati reaches quite different conclusions in a recent study based upon Indian data.* His major

*Jagdish Bhagwati, "Education, Class Structure and Income Equality," World Development, Vol. 1, No. 5, May 1973.

hypothesis is the following:

> For each class of education, the State (in capitalist LDCs) will subsidize the cost of education; the benefits of these subsidies will accrue disporportionately less to the poorer groups at each level of education; the higher the educational level being considered, the higher will be the average income-level of the groups to which students belong; and the rate of governmental subsidization to higher education will be greater than that to primary education.**

**Ibid., p. 24.

Thus, Bhagwati suggests that for all levels of education the richer classes receive greater benefits in the form of educational subsidies than the poorer classes. He claims, moreover, that for primary education the opportunity costs for the lowest income groups are greater than for the highest income groups; the benefits are lower; thus the private rate or return to them on primary education is lower; and the cost of capital, to which the rate of return must be compared, is higher than for the higher-income class groups. The same is true for secondary and higher education, except that the relative benefits to high-income groups are much higher.

Bhagwati supports his argument as follows:

> These hypotheses are based on the following assumptions about the lower income groups:
> (i) The opportunity cost of labour, resulting from the fact that children of primary-school age cannot work during the time that they attend school, is higher because typically these groups can and do use children of this age in gainful work whereas this is not possible (or allowed) with the other, higher-income groups.

(ii) The benefits from primary education are lower for these groups again because (a) the probability of finding the rural jobs such as primary school teaching, post office and such other jobs requiring primary (and secondary) education is lower for these groups; (b) if higher returns accrue through increased productivity on the farm, it is unlikely to accrue in full to the educated but low-income landless labourer whereas these returns would accrue fully to the educated but richer landholding farmer; and (c) in so far as the higher returns accrue through higher mobility to the urban sector where jobs requiring primary education (e.g., watchmen in Delhi colleges) are relatively less scarce, the lower-income groups with less urban contacts and generally lower mobility would correspondingly have less access to such returns from primary education.

(iii) At the same time, clearly, in a world where many of the members of the lower-income groups, especially in the rural areas, have indebtedness at high rates of interest, their opportunity cost of capital is greater than that of the middle- and upper-income groups in general; this asymmetry is further reinforced by the general banking and lending practice of charging higher interests rates to the smaller borrowers.*

*Ibid., p. 25.

Bhagwati supports these proportions by evidence from Indian experience. And he observes that the higher-income groups are likely to get away with this so long as the education system, by enabling some lower-income groups to educate their children and gain access to better paid jobs, gives the appearance of providing mobility and greater equality of opportunity than might otherwise obtain in a capitalist society. In a capitalist society, Bhagwati would advocate that the higher-income groups pay the full cost of education of their children.

In conclusion, knowledge about the indidence of costs and benefits of formal education in developing countries is meager. But some tentative generalizations seem plausible: the provision and financing of formal education is regressive, the burdens falling more heavily on the lower-income groups and the benefits accruing largely to the upper-income classes. But such

disparities tend to decrease as countries advance. In most cases the higher-income groups clearly receive the lion's share of benefits of education, whether they be in the form of acquired skills and knowledge or simply entry passes into the higher paid occupations to which access is limited by arbitrary educational requirements. It may also true in some developing countries that, while receiving the larger share of benefits of public educational expenditures, the rich may at the same time be investing substantial private resources of their own in education of their children. In looking at the impact on income distribution, therefore, it is important to determine how large these private contributions are in comparison with the benefits from public expenditures. And, it is likewise essential to evalute the importance of the "barrier effect" which excludes the uneducated from access to the more lucrative occupations. The need for more research in this area is obvious.*

*Definitive studies of the connection between formal education and income distribution are virtually non-existent. but some scholars apparently are initiating new theoretical and empirical investigations. One example is a draft paper by Asim K. Dasgupta for the World Bank entitled "Income Distribution, Education and Capital Accumulation." The author reviews the human capital doctrine, constructs an econometric model, and gives some conclusions from empirical applications in India and Colombia. He concludes that investments in education in both countries tend to disequalize incomes. In India, during recent years, government policy has tended to support and reinforce the forces of the private sector which tend to increase income disparities. In Colombia, on the other hand, government policy appears to have worked toward equalization, although its effect has been minor. (See Asim K. Dasgupta, Income Distribution, Education and Capital Accumulation, working paper for International Bank for Reconstruction and Development, Development Economics Department, Population and Human Resources Division, May 1974 (mimeo).

Nonformal Education and Income Distribution*

*Much of the material in this section is based upon an analysis of the literature on nonformal education made by my colleague, Francisco Swett, during the summer of 1974. See Francisco Swett, Formal and Nonformal Education in Educational Development - A Review and a Critique of the Literature, Discussion Paper #48, Woodrow Wilson School, Princeton University, Princeton, N.J.: 1974 (mimeo).

As stated earlier, nonformal education is a kind of short-hand designation for a heterogeneous conglomeration of organized education and training programs which are unconnected with the formal schooling system. A brief description of the six major nonformal education programs examined in this paper follows:

Agricultural extension services of some kind are available in nearly all developing countries. Their function is to extend knowledge of agricultural processes and animal husbandry to farmers, to help them improve output, to teach them new technologies, and to assist in solving production problems. Sometimes agricultural extension services provide assistance also in the purchasing, credit and marketing areas. Typically, they are financed and managed by ministries of agriculture.

Rural multi-purpose training centers provide a variety of learning opportunities for rural dwellers. They may include programs in agricultural technology, home economics, rural crafts, elementary farm management, and various kinds of literacy projects. In some cases they also serve as bases for agricultural extension work. In theory, at least, they may provide a wide variety of learning opportunities through short-term residence programs, and they have the potential for coordination of many different services designed for the rural population. They may be financed and managed by different government ministries, and sometimes as joint projects of several ministries.

Work-oriented literacy programs, though still largely in the experimental stage, have great potential for improving skills and knowledge of adults and younger persons who have had no access to primary education. The theory of these programs is that literacy can and should be developed through the process of learning more productive ways of growing crops or performing industrial work, and that the learning of useful skills should be a bi-product of literacy training programs. This dual objective approach is alleged to be a faster and more practical way of developing both literacy and a more efficient means of developing productive skills.

Urban training and testing centers are designed to upgrade the skills of persons already employed. They are usually geared to the specific needs of particular plants and industries. In most countries they are much more effective

in skill generation than formal vocational schools, and they can reach far larger numbers of learners.

A more elaborate system for specific skill development of both employed and pre-employed members of the labor force are the payroll-tax-financial training and apprenticeship training pools commonly found in many Latin American countries. A good example is SENA in Colombia.* This organization

*For a brief description, see Harbison, Human Resources as the Wealth of Nations, pp. 85-89.

operates a vast array of training services for employers and workers (both within plants and in training centers) in commerce, industry, agriculture, and animal husbandry. It draws its financial support from a tax of two percent on salaries and wages levied on both public and private enterprises. It is a semi-autonomous organization within the Ministry of Labor, but controls its own resources and plans its own operations in close contact with participating employers in both the public and private sectors. By any measure, SENA is a big operation in Colombia. In 1971, for example, its total expenditures were equivalent to about one-eighth of total public expenditures on education. And since its revenues are geared to payrolls, it is virtually assured of a continuous and growing source of funds.

Finally, we include in this analysis nutrition and health information and training services. To be sure, improvements in health and nutrition may not show up immediately in national or personal income statistics. But they can improve the levels of living of the poor and in the long-run raise the vitality and mental development of future generations which can be a potent factor in increasing productivity.

In recent years, it has been fashionable to downgrade the contributions of formal schooling to development and to extol the virtues of nonformal education programs. The shortcomings of formal schooling are, of course, well

documented: sharply rising costs, inflexibility, lack of relevancy, top-heavy administration, unequal access between rural and urban dwellers, and poorly trained teachers. Many people contend that nonformal education programs potentially can be much more productive. They may be less costly, more flexible and innovative, more relevant to practical needs, more decentralized in administration, more readily available to rural dwellers, and less dependent upon trained teachers. Nevertheless, in general there is almost no concrete evidence to prove this contention. Cost-benefit and cost-effectiveness studies are virtually non-existent. Indeed, no country has yet even attempted to make a complete inventory of its nonformal education programs or to estimate total resources allocated to them.*

*Within the past three years, several organizations have concentrated on research on nonformal education. Particularly noteworthy are the studies of the International Committee for Educational Development, Essex, Connecticut, under the direction of Phillip Coombs made for UNICEF and the World Bank, and the extensive studies made and in progress by the Institute for International Studies in Education at Michigan State University, under the leadership of Cole Brembeck. None, however, have as yet issued traditional cost-benefit analyses of specific programs mainly because of unavailability of adequate quantitative data. However, they do provide a wealth of case studies on a wide range of nonformal education programs in many different countries and they attempt to assess the effectiveness of these programs in terms of their stated goals.

It is thus very difficult to assess the probable impact of nonformal education programs on income distribution. However, we may suggest a few rather plausible hypothesis.

First, in comparison with formal schooling, nonformal education programs provide fewer avenues for upward mobility. They rarely offer degrees, certificates, or other credentials essential for passage through the gate to positions of status, power and wealth. Participation in an agricultural extension project, farmer training center, or literacy class is not likely to provide poor rural dwellers with an "escape from bush" into the modern sector enclaves. Unlike a diploma from a secondary school or a degree from a university,

completion of most nonformal education programs carries no great prestige or rights to high pay. Indeed, the objective of most nonformal programs is to make people more effective at what they are presently doing rather than to move them upward in the labor force hierarchy.

Second, there is little evidence to indicate that nonformal programs have in practice done much to alleviate low-end poverty. In the developing countries nonformal educational services are mostly utilized by the richer and better educated elements of the population. The larger and better off farmers are usually the principal beneficiaries of agricultural extension; the apprenticeship programs of SENA are open only to those with previous formal schooling; and even most literacy programs are confined to the urban areas. As a general rule, the lowest income groups are seldom the major beneficiaries of most public services, and nonformal education activities are no exception.

Finally, like formal schooling, nonformal education programs probably increase the disparities between the rich and the poor. A relatively small proportion of the population has access to them; expenditures per person served may be quite high; and the well-to-do usually receive the lion's share of benefits. But, in contrast to formal schooling, nonformal education programs are less likely to become selection devices. Completion of a nonformal program does not bring the same kind of high status and pay as a diploma or a university degree. Thus it is probable that nonformal programs are not as strong a force in widening income gaps as formal schooling.

It is probably true, however, that nonformal education could be beamed at different target groups. Agricultural extension could be directed to subsistence farmers as well to the more prosperous. Training centers, apprenticeship programs, literacy classes, and nutrition programs could concentrate on the underemployed and the undereducated. In most countries this might involve rather fundamental changes in the goals of strategies of national development.

Work-Related Skill and Knowledge Generation and Income Distribution

Work-related skill and knowledge generation is the most universal of all processes of learning. Working environments and employing institutions, whether primitive or modern, produce most of the skills they require almost automatically without the conscious attention of planners, bureaucrats, or educators. This kind of human capital formation is a constant albeit largely unnoticed process. And, it is virtually impossible to separate out the costs of this kind of skill development.

Of the three kinds of learning process, work-related skill and knowledge generation probably offers the fewest opportunities for upward mobility. One could not argue that, in itself, it widens or narrows the gap between the rich and the poor. For most of the low-income groups, it is the only available means of skill and knowledge acquisition. However, if working environments could be improved, these groups might be the main beneficiaries. In short, the best means of attacking low-end poverty could be to reorganize agricultural production, to improve transportation and communication, and to disseminate better technologies as widely as possible. But this requires the creation of new organizational architecture, the motivation and training of new leadership, and, most important, the adoption of new priorities in the modernization process.

Thus the improvement of working environments and the skill and knowledge generating capacity inherent in them requires other human inputs, and here both formal and organized nonformal educational activities may play critical roles. Organization builders, technologists, and skilled cadres are needed to transform working environments, and their effectiveness may be directly related to their prior participation in both formal and nonformal education activities.

Summary: Learning Programs and Income Distribution

To summarize, different learning opportunities can have different effects on income distribution. Formal education may provide limited opportunity for some low-income persons to move upward in the labor force hierarchy, but it is unlikely to alleviate low-end poverty and it tends to widen the gap between the rich and the poor. Organized nonformal education programs offer very little upward mobility, and in practice they too may increase income disparities and do little to help the very poor. However, nonformal programs could be redesigned to raise living standards of the less affluent elements of the population. Work-related learning is the only widely available opportunity for most low-income groups to acquire productive skills and knowledge, but it provides little or no upward mobility. Improving the skill and knowledge generation capacity of working environments, particularly in rural areas, appears to be the most effective means of raising living standards of the masses and thus alleviating low-end poverty. But this requires inputs of organizational and technical manpower to lead the march of modernization which in turn makes demands upon both formal and nonformal education.

It would be unwise to make sweeping generalizations about the connection between learning opportunities and income distribution for all developing countries. One must examine separately the learning systems of individual countries, and even here hard data are generally unavailable. However, it is possible to specify the processes for analyzing national learning system in individual countries and to examine as well the probable outcomes of pursuing different development goals.

The Processes of Analysis of Learning Systems

In some respects, a nation-wide learning system (including its three constituent elements) can be thought of as a sector of the economy. Thus some of the techniques of sector analysis which are useful in analyzing other sectors

such as agriculture or manufacturing may be appropriate. Yet, in other respects learning is an integral element of all productive activities. And this is particularly true in the case of work-oriented skill and knowledge generation. For this reason, the methodology for analysis of education and learning services is somewhat unique; the simple calculation of benefit-cost ratios is of only limited usefulness; and inputs and outputs are often impossible to measure in tangible quantitative terms. At least for the present, analysis of learning systems must be based more upon rational judgment than on hard quantifiable data..

The first step in the analysis of a learning system is to look at the generation of skills and knowledge in the various working environments. This is called the manpower-training assessment, and calls for examination of employment and skill acquisition processes in all rural and urban activities. More specifically the following questions need to be explored:

1. Access to working environments

   What is the aggregate employment in the modern traditional and intermediate sectors of the economy?

   For each sector and major activity, what are the principal "ports of entry" into employment?

   In each sector and major activity, what pre-employment education or skills are required for entry?

2. Learning process

   In each sector and major activity, how do people learn to perform their tasks?

   What kinds of organized training are provided by the larger employing institutions?

   What kinds of skills cannot be developed practically "on-the-job" - i.e. in what critical areas is there a need for persons with specific kinds of formal or nonformal education?

3. Constraints

   What are the practical limits of work-related skill and knowledge generation in each sector and major activity?

   What measures, if any, would be effective in improving the skill generation capacity of various working environment?

What are the essential inputs of educated manpower - organizational and technical human resources - required to take appropriate measures to improve working environments?

At best answers to questions such as those posed above will be rough estimates, and where hard data is unavailable, they may have to be based upon informal judgments. Nevertheless, a careful assessment of the employment and skill generating potential of working environments should be the starting point for a rational analysis of a nation-wide learning system.

The next step is to examine the formal education system. Developing countries have a good deal of experience in making formal education reviews. Typically they include estimates of enrollments, outputs and drop-outs at various levels; enrollment ratios by major areas or regions; pupil-teacher ratios; unit costs for various levels and kinds of schooling; the need for teacher training; and the appropriations of the orientation and curriculum of education at all levels. In some cases, the formal education review is related to a survey of "needs" for medium and high-level manpower in the modern sectors. But rarely, if ever, has it been based upon a comprehensive prior analysis of the work-oriented learning process as described above. The important questions for consideration are these:

1. Access to formal education

   At each level, who gains access to formal schooling, and more important, what groups are denied access and for what reasons?

   What are the differential rates of access as between modern, intermediate and traditional sectors (rural and urban)?

2. Orientation of formal education

   What are the major objectives of various levels and types of schooling?

   Is formal education at various levels effectively geared to the requirements for educated manpower in working environments?

3. Constraints

   What are the limits, financial and human, to expansion and improvement of education?

   How rapidly can access be extended to presently excluded groups?

   How can the financial burdens of education best be shared?

Education planners are familiar with all of these questions, and reasonably good quantitative data is available in many countries.

The third step, assessment of organized nonformal education, is more difficult. Nonformal education activities are operated by a wide variety of ministries and private organizations. Except perhaps in the case of agricultural extension, there is very little coordination of programs and no single locus of planning. Information on enrollments and outputs is scarce, and data on costs and benefits almost non-existent. The best that can be expected is a general estimate of access, enrollments, outputs, orientation and constraints of major programs such as those mentioned earlier in this paper.

The fourth and most critical step in analysis of learning systems is the assessment of possible alternative combinations of available or potential learning opportunities. In short, how can one determine the most appropriate mix of programs, the highest quality and lowest cost combinations, and, thus the most effective strategy for the overall development of the nation-wide learning system? Here one must start by classifying learning opportunities.

The three categories of learning programs each perform some unique services. For example, formal education has a comparative advantage in developing quantitative skills; nonformal education may be necessary to develop specialized skills; work-oriented learning may be the only practical means of developing most lower-level skills. In other cases, different learning processes may be complementary. For example, some kinds of trade training may require completion of primary ecucation; or the on-the-job training of agricultural assistants may be dependent on some prior formal technical education. Thus, the complementarities between learning programs must be specified with as much precision as possible.

Finally, some programs are substitutable. Here there are critical choices to be made both within each of the three basic learning categories as well as between them. In this case, comparative cost-benefit studies may be useful.

The choices within the formal schooling system are perhaps the most widely recognized. For example, in expanding access to first-level education, is it better to provide a minimal program of four to five years for a larger number of children than perhaps six to eight years for a smaller number? Is it better to opt for large numbers of teachers with little formal education (perhaps eight or nine years) or to rely on higher paid teachers with longer pre-employment training? In allocating resources for education, what are the appropriate shares which should go to primary, secondary and higher? For example, an Ethiopian Education Sector review (1972) faces such questions squarely. It projects overall availability of resources based upon expected growth in GNP and government revenues; it then subtracts fixed amounts for secondary and higher education; and it allocates the remainder to first-level primary schooling and specified nonformal education programs. It opts for a four-year basic primary school with minimally trained teachers, and adult education programs to provide learning opportunities for those who never had access to formal schooling. In effect, from a social objectives perspective, it places the goal of providing universal learning opportunity before that of universal primary education for children.*

*Education Sector Review, Ministry of Education, Ethiopia, 1972 (mimeo).

Another series of alternatives faces the rural development planner. Given finite amounts of resources, what emphasis should be given to agricultural extension, farmer training classes, or multiple-purpose rural training centers which may provide combined programs in nutrition, health, home-making, rural crafts and functional literacy in addition to farming techniques? And within the vast array of other nonformal education activities, what are the best choices between radio and television programs, traditional literacy classes, and functionally oriented community development projects? In many countries it may be

possible to estimate the costs of these various programs; studies of their relative effectiveness are at least in the beginning stages. The most perplexing problem in all cases, however, is the difficulty of evaluating outputs. Here simple quantitative measures may be meaningless, and qualitative differences must be distinguished largely by informed judgment.

There are also critical choices in improving the learning services of the employing institutions. Will taxes or subsidies induce large employers to offer better training opportunities? Are "training pools," such as the payroll-tax financed training provided by SENA or comparable Latin American institutions, the most feasible method of extending services to small and medium sized enterprises? Will technical assistance to small proprietors improve the operation of indigenous apprenticeship systems, or would they do just as well if left alone?

The choices <u>between</u> the three broad categories of learning services, however, are more difficult yet often more fundamental than the choices within them. Here are some examples:

Skilled craftsmen such as electricians, carpenters, masons, fitters, and automobile mechanics may be trained in employment either through apprenticeship arrangements or by less formal means of gaining experience on the job. But they may also learn their trade in formal vocational schools. Take automobile mechanics as a case in point. In the developing countries most young people learn this trade as apprentices in small garages and shops. This indigenous training system might be improved by organizing e nsion services for the garage owners, or by off-duty training classes in the principal towns and cities. Another alternative might be to induce the major distributors of cars and trucks, which usually have the best facilities for producing mechanics, to train a surplus beyond their own needs. Pre-employment formal training in vocational schools is the other alternative, but probably in most cases the

most expensive and least effective. A good sector review should weigh carefully the alternative processes of training such skilled craftsmen and suggest those combinations most likely to develop the quality of craftsmen needed in shortest time and at the least expense. In many cases, the logical choice might be to rely heavily on employing institutions, to subsidize on-the-job training programs and to de-emphasize if not forego completely the formal vocational schools.

The training of senior technicians is another area for serious consideration. Technicians are persons whose skills are highly specialized to particular working environments. Most of their training must be in employment. Often a technician must be sent abroad for short periods to learn the technology of a particular industry, process, or complex of equipment. It is ridiculous to assume that a formal school or institute can produce a full-blown standardized technician for "industry" in the developing countries. In most cases, technical trainees in the polytechnic institutions must be sponsored by particular employers, and courses of instruction must be specialized to meet the requirements of the particular sponsoring organization. Here again a proper assessment would evaluate carefully the capacity of employers to train technicians and the extent to which pre-employment education in formal schools is either required or relevant.

The training of nurses and medical technicians is another example where attention must be directed first to the role of employing institutions. For the most part, para-medical personnel are trained in hospitals or clinics rather than in a school classroom. Another related question is whether physicians must get their clinical training in expensive teaching hospitals associated with the universities or in rural hospitals and medical stations.

Finally, there is the crucial question of developing managers and administrators. Such persons certainly cannot be prefabricated in schools of business or university courses in public administration. They can get a good deal of relevant education before employment, but then leadership

and managerial skills are developed in the crucible of practical experience. Staff training courses for those already employed are useful as stimulants to learning as well as refresher course in relevant engineering and scientific fields. Here again we argue that skill and knowledge generation in the modern sectors of developing countries is not a matter of educating a pre-determined number of persons to fill an estimated number of occupational slots, but rather a continuous process of human resource development centering upon the dynamic imperatives of employing institutions.

Many more examples of critical choices of alternatives could be presented. In any developing country, the range of such choices are wide, and the logical selection of the best alternatives is the key to effective human resource development planning.

Information on which to calculate relative costs and benefits of alternative learning programs is disappointing. Few attempts have been made to assess costs and benefits of organized nonformal education, and practically none have been made for on-the-job training.* The most ambitious attempt is a recent

* Reference to be supplied later.

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by Zimmelman for the World Bank. It includes an exhaustive review of the literature which relates for the most part only to relatively advanced countries. The comparisons of training costs and benefits, moreover, are available only for a rather narrow range of modern-sector industrial occupations. And from these it is impossible to make generalizations for the developing countries with respect to relative cost-effectiveness of formal schooling, nonformal education, and work-related learning.** In conclusion it is un-

* Reference to be supplied later.

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realistic to expect that reliable quantitative cost-effectiveness studies of different kinds of learning programs can be made in developing countries in the near future.

The Selection of Goals

The processes of analysis of learning systems are important, and the need for much more reliable quantitative data is clear. However, even more critical is the selection of development goals. In short, the objectives of the overall strategy of modernization are in the end the most crucial determinants of the education-income connection in the developing countries. For example, a strategy designed primarily to maximize opportunities for employment will require a different mix of learning programs from a strategy aimed primarily at maximization of GNP. Although both might provide the same amount of growth, the patterns of income distribution and the allocation of learning opportunities could be quite different.

The full-employment objective, or human resource approach, holds that human resources, not material wealth as such, are the ultimate basis of the wealth of nations. Thus, the major goals of development are maximum activity and the maximum possible development of their relevant skills and knowledge. Economic growth as expressed by the increase in GNP then becomes the logical consequence of effective utilization and development of manpower. This approach stresses the importance of utilizing all human resources in productive activity and developing the skills, knowledge and capacities of the entire labor force. In this perspective, the development effort should not be concentrated solely or even mainly on a few leading sectors. Small per capita improvement in earnings of the masses is considered to be just as important for aggregate growth as spectacular advances in the modern sector enclaves. Thus, the human resources approach emphasizes growth with greater income

equality.* In most countries it would stress more learning opportunities

*For further elaboration of this approach, see Harbison, op. cit., Chapter 6. This approach is quite similar also to that used in the recent ILO country studies of employment generation. International Labour Organization, Employment, Incomes and Equality: A Strategy for Increasing Productive Employment in Kenya, Geneva: 1972; _____, Employment and Income Policies for Iran, Geneva: 1973; _____, Matching Employment Opportunities and Expectations. A Programme of Action for Ceylon (2 Vols.), Geneva: 1971; _____, Towards Full Employment: A Programme for Colombia, Geneva: 1970.

of all kinds for the rural populations, even at the expense of curtailing expenditures on formal education in the modern sector enclaves. It would give high priority to improvement of working environments in the agricultural sector, and less emphasis on technical education for urban industrial development.

In constrast, a development strategy aimed at maximization of GNP as such might concentrate on rapid modern sector growth, emphasizing capital-intensive industrialization, exploitation of mineral resources (i.e. iron or petroleum if available), and large plantation agriculture. In this case the small minority of the population in the modern sector enclaves would reap the rewards of progress while the rural economy would remain stagnant. Indeed, many of the developing countries have had this kind of dualistic growth characterized by ever widening disparities in income distribution. A learning system geared to this kind of economy would give high priority to formal education in the urban areas, and particularly to proliferation of vocational schools, technical institutes, and large-scale universities, all of which would result in further widening the income gap between the rich and the poor.

Clearly, the overall design of the strategy for development will be the major force determining labor force mobility, alleviation of low-end poverty, and narrowing of income variances. Education and learning programs have only minor impacts. A country's learning system is logically derived from an overall development strategy based upon explicit or implied goals; it seldom is the initiating force in the building of such a strategy.

Conclusions

The argument presented in this paper may be summarized briefly: Formal schooling, organized nonformal education, and work-related skill and knowledge generation are the principal components of a country's learning system. All three may have differing effects on upward mobility, low-end poverty income variances between groups and individuals. To estimate these effects it is necessary to analyze the operation of learning systems in individual countries. In order to change the education-income connection in a particular country, one must first examine carefully the comparative advantages of each of the components of the learning system as well as the consequences of substitution of one component for another. This is presently very difficult because of the dearth of quantitative and qualitative data, particularly with respect to nonformal education activities and work-related learning. The most crucial considerations, however, are the broad goals of development in each country and the strategy employed to achieve them. These shape the patterns of income distribution, and they also determine the parameters of the nation-wide learning system. One is not likely to change the economic, social and political philosophy of a nation and its leaders by simply tinkering with the education and learning system.

Sweeping generalizations about the education-income connection in developing countries are not in order. Yet, a few observations, which might better be presented as hypotheses, are permissible. The following are posed for consideration:

1. In most developing countries, it might be advantageous to curtail the outlays for higher education, or at least keep them from rising. This does not necessarily imply a lessening of total expenditures for higher education. It means simply that a greater proportion of costs could be assumed by the beneficiaries, by their parents, and to some extent by the larger private

enterprises. Educational institutions could charge fees to cover a greater proportion of instruction costs, and offer loans repayable by the beneficiaries at a later time from future earnings. At the same time, bursaries could be given to students of the poorer families. Although this approach would encounter formidable administrative and political resistance, the principle is sound. In developing countries individual returns to investment in higher education are higher than social returns. Little is to be gained by subsidizing students of the richer families. Also, an often neglected source of support is the provision by private enterprises of sponsored scholarships in fields of study where there is a critical demand for certain strategic skills. Engineering, scientific, and business education are cases in point.

The increase in private funding for higher education would have these positive advantages: First, more public funds would be available for other important learning services, which have higher priority for expansion; second, some of the artificial demand for higher education stemming from substantial public subsidies would be curtailed, and this might help solve the ever-rising problem of underemployment of educated people; and finally, there might be greater incentive to gear higher education more closely to the effective demand for high-level manpower. This policy most certainly would work in the direction of decreasing income inequalities.

2. The allocation of greater proportions of public expenditures to primary education might be appropriate, but only under rather limited circumstances. We have already noted that millions of children may be denied access to formal primary education for several decades. But a crash effort to achieve universal primary education, in itself, might do little to promote either growth or greater income equality.

In the first place, there is little advantage in making people literate if there is nothing for them to read. Particularly in rural areas reading

materials are scarce. Thus, the provision of primary schooling in stagnant rural areas might do little more than encourage young school leavers to migrate to the urban areas in search of non-existent jobs. Schooling, as such, is not likely to induce growth, but it can contribute to a growth process which is already underway. Thus, priority should be given to expansion of formal education in those areas where concerted efforts are already being made to bring about broadly based rural development, where progress is being made in raising agricultural incomes, expanding small-scale industry and commerce, and improving the infrastructure of roads and communications.

There are also other critical questions in allocating additional resources for primary education. There is the trade-off between numbers and quality; there are choices in use of educational technology; there is the problem of relevancy of the curriculum; and there is the question of self-help contributions of local communities and the requirements for financing from provisional or central governments.

Thus, we should be wary of the advice of some economists who, on the basis of superficial rate-of-return analysis, would advocate more across-the-board allocations for primary education. Investment in more schooling can be wasteful as well as beneficial; in most of today's developing countries, the allocation of additional resources to provide "more of the same" kind of schooling might be tragically unproductive.

3. The allocation of a larger proportion of resources to nonformal education probably could have a significant positive effect on income distribution. As a practical matter, the developing countries would have to concentrate resources on a relatively small number of clearly productive educative services which promise the highest pay-offs. The following are probably among the best candidates: Agricultural extension, rural multiple purpose training centers, work-oriented literacy programs, urban trade training and testing centers for employed workers, and nutrition-health training programs.

At this point, however, we inject a word of caution. Access to the various kinds of nonformal training services described above may be just as unequal as access to formal schooling. The high-income groups may be the principal beneficiaries of these learning opportunities, and they may share a relatively small proportion of the costs. In some cases, as with SENA in Colombia, unit costs of out-of-school training may be quite high as compared with formal schooling.* And some training programs may be ineffective in attaining their

*Harbison, op. cit., pp. 85-89.

objectives. Nonformal education activities, therefore, warrant much more study, critical evaluation, and careful planning. And particular attention must be focused on the integration of formal and nonformal education programs. In some cases, nonformal training may be a substitute for formal schooling; in others, some formal education may be a prerequisite for winning effective benefits from nonformal training. In other words, one must consider the costs, financing, and benefits of "packages" of learning opportunities as well as isolated programs.

4. As stressed earlier, developing countries have much to gain by placing greater responsibility on employers for skill training. Particularly in the modern sector, large expatriate firms, automobile distributors, petroleum companies, and most kinds of manufacturing enterprises have tremendous capacity for training workers. In most cases they do very well in training their own employees. With appropriate incentives they might train a surplus for employment in the smaller enterprises. And, organizations for pooled training financed by payroll taxes have proven to be highly successful throughout Latin America, and the idea is catching on in other areas as well.** Shifting more

**Ibid.

of the burden of training to employers is likely to have a positive impact on income distribution; and at the same time, it may be a more efficient means of skill development than further investment in pre-employment vocational trade training.

5. Any efforts to equalize and improve learning opportunities should be integrated with and not separated from other fundamental measures for promoting growth with greater equality of incomes. Learning, although desirable as an end in itself, does not necessarily initiate economic development. It is more likely to contribute to growth which is already in progress. Both formal education and out-of-school learning activities work best when earning opportunities are expanding; they may be quite useless in stagnant economies. Thus, other programs for rural and industrial development may have to reach a take-off stage before additional investments in learning services can effectively contribute to growth.

Research Priorities

In a field where knowledge is so underdeveloped, it is appropriate to specify research priorities. A few are suggested below:

1. The outcomes of formal schooling at all levels need a great deal more study. Here the project undertaken by the Public Service Laboratory of Georgetown University for US-AID is making a substantial contribution.* The several

*Footnote to be supplied later.

papers it has commissioned provides a summary of existing knowledge and identifies many of the more important areas for further research. Hopefully, attention will be given to relating outcomes such as examination scores, tests

of cognitive skills and motivation measurements to subsequent incomes in the world of work. Data, of course, is a major problem. In the less developed countries there is very little information about earnings, education, age and training of school-leavers; even where it exists, it is generally based only upon one or at most two census enumerations.

2. Knowledge about the effectiveness, costs and income impacts of nonformal education programs is even more meager. Here research on rural extension services is perhaps of highest priority. Recent experience with "the green revolution" suggests that the larger and more prosperous farmers are the principal beneficiaries of the new technology, thereby increasing income disparities between the rich and the poor in rural areas. Efforts should now be made to assess the costs and consequence of providing more extensive services to the smaller and poorer farming units. Other critical nonformal education programs need similar exploration. Fortunately, interest in this area is growing. Studies of out-of-school education are in progress in many universities; pilot projects are mushrooming; and some economists are attempting cost-effectivesnss analyses of a few programs.* A focal point of future

*International Council for Educational Development, Nonformal Education for Rural Development, Essex, Connecticut: 1973 (2 Vols.).

research effort should be on trade-offs between formal and nonformal education, the linkages between the two, and the possibilities of combination of both in national learning systems.

3. The study of the potentialities of "the employer-as-trainer" is next on our high priority list. Despite the shortcomings of formal ecucation, vocational schools, literacy and technical education, employers in the modern sectors of developing countries have successfully trained even the highest level manpower for their operations. One might even say that they have been trained effective labor forces in spite of rather than because of formal

education. It is relatively easy to staff and operate a steel mill, a petroleum refinery, or a large manufacturing complex in a developing country. The job requirements are known, the training techniques are available, strategic personnel may be imported and technical assistance is available from suppliers of equipment. Automobile distributors can service and repair their own vehicles; hotels can train their own personnel; and government bureaucracies are quite able to teach their functionaries how to produce mountains of memos! The amount of training, both good and bad, which takes place routinely on-the-job is enormous; the improvements which could be made by better management and more deliberate efforts at training may be infinite. And the potential does not end here. Small garages train mechanics in apprenticeship; the "market ladies" in Ghana teach their children, relatives and husbands the essentials of business administration; the model farmer is often more knowledgable about growing crops than the university-trained extension officer. The challenge for research is simple. Why not study, appraise and evaluate the potential of this vast mechanism for human resource development, and explore the ways and means of improving its operation?

4. More case studies such as Jallade's analysis of expenditures on education and income distribution in Colombia would be very valuable. However, they should be extended to nonformal as well as formal education. And, where possible they should attempt to measure the benefits of education to individuals and groups in broader terms than the present expenditures on schooling minus payments in taxes. Data problems, again, are the major obstacles at least in the near future.

5. More longitudinal or "tracer studies" are needed to relate schooling and organized training to experience in the work-place. Admittedly, such follow-up studies are difficult and expensive, but the returns, in terms of project evaluation and feedback to skill and knowledge generating institutions, could be very great.

6. Finally, the most critical need of all is for research on the organization, leadership requirements, and skill generation processes for rural development.

Today, the leadership of many developing countries is aware that a rural transformation in which the masses share some of the fruits of progress is one of the imperatives for an industrial revolution. In many countries there are experimental pilot projects in rural development, some fairly successful and others with quite mixed results.* These should be studied carefully, for

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they may suggest some solutions for the problems of rural development which presently seem intractable to modern man.

Statistical Appendix

Joan Maruhnic

This appendix is an attempt to examine some of the more readily available quantitative indicators of educational enrollments and expenditures and relationships between them. First the two groups -- more advanced and less developed -- of countries are compared on GNP per capita and percent of GNP spent on education. Then the percent of total enrollment at various levels is compared to the percent of total educational expenditure at each level over a period of approximately ten years. Next actual dollar amounts spent per pupil, again at various levels and over time, are considered with the GNP per capita. Enrollment ratios for the relevant age groups -- total, male, and female -- are detailed for the same periods of time. Actual percentage distribution of students by grade as depicted in the charts on page 9 are also included.

Data on enrollments and financing of education are not easily comparable among countries. In order to maximize such comparability, for instance in methods of calculating enrollment ratios, principally Unesco data were used in these tables.[1] There have been real strides in data collection during the second development decade at Unesco. Many new series have been added, for example percent of total enrollment by grade at primary and secondary levels. However, the method of collecting these data has not advanced as rapidly. Questionnaires which eventually reach the desk of an overworked clerk at the ministry of education do not produce accurate, comparable statistics. Employing field workers, especially in the less developed countries, would certainly repay the investment by producing standardized, more complete data. No other agency but Unesco collects and collates these kinds of data and an attempt to make it more complete should be of highest priority.

The countries selected for this study reflect this lack of data. There are some countries from all of the less developed areas but they are not "representative" in the usual sense of the word, i.e., in size, colonial background, political structure, etc. For most of the tables there are ten

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[1] Where other sources were used, they are identified. Unesco data from the 1971 Statistical Yearbook were used in all other cases.

"more advanced" and twenty "less developed" countries. Even for the developed countries, data availability was, unfortunately, the primary criterion for the selection of the sample. Bearing in mind these constraints, a study of the following tables does give some "food for thought."

Table 1 ranks the countries on GNP per capita (obtained from the IBRD World Tables) and also on percent of GNP spent on education for the latest year available. Ideally this percent should include educational spending at all levels of government. Again, partly because of the method of reporting, this is not true in all cases. In an excellent study of educational financing done at Harvard for AID,[2] the serious problem of underreporting is well documented. The authors obtained country statistics gathered by investigators on the scene. For all of the countries that are considered in both the Harvard study and this paper, the former figures are greater. This consistent underreporting in Unesco figures reinforces the superiority of individual country data collection.

	% GNP on education		
	Harvard study	Unesco	factor
Argentina	3.2	2.0	1.60
Brazil	4.5	3.0	1.50
Chile	5.6	4.6	1.22
Colombia	4.1	1.7	2.41
Ethiopia	3.4	1.3	2.61
Japan	6.6	4.0	1.65
Korea	5.3	3.8	1.39
Venezuela	5.9	4.5	1.31

The ranges of percent of GNP spent on education overlap a good deal for the more advanced and less developed groups of countries -- 7.9-1.4 for the former and 5.6-1.3 for the latter. There is no obvious correlation between per capita GNP ("ability" to pay) and percent of GNP spent on education ("willingness" to pay). One interesting point concerning the change in a country's ranking on the two variables is that in the more advanced countries those with a more "socialized" type of government did rise more than might be expected.

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[2] Manuel Zymelman and José Dominguez, Analysis of Educational Data of Selected Countries, Cambridge, Massachusetts: AID-Harvard Project on the Financing of Education. (mimeo.)

TABLE 1

	GNP per capita		Public expenditure on education	
	$	Rank	as % of GNP	Rank
More Advanced				
United States	3603	1	6.3	3
Sweden	2429	2	7.9	1
France	2091	3	4.5	5.5
Israel	1354	4	6.8	2
Japan	1218	5	4.0	8
Italy	1147	6	4.3	7
Czechoslovakia	1076	7	4.5	5.5
Argentina	776	8	2.0	9
Yugoslavia	492	9	5.1	4
Portugal	421	10	1.4	10
Median	1182.5		4.5	
Less Developed				
Venezuela	842	1	4.5	3
Mexico	476	2	2.5	9.5
Colombia	251	3	1.7	12
Paraguay	204	4	2.0	11
Ecuador	202	5.5	4.0	5
Tunisia	202	5.5	5.6	1
Korea (R.)	180	7	3.8	6.5
Ghana	149	8	3.8	6.5
C.A.R.	108	9	3.3	8
Pakistan	91	10	1.4	13
India	90	11	2.5	9.5
Botswana	85	12	4.9	2
Dahomey	70	13	4.2	4
Ethiopia	57	14	1.3	14
Median	164.5		3.6	

In Table 2 the percent of total pupil enrollment is compared to the percent of total educational budget spent at the various levels in 1960, 1965, and 1969 (or the closest years possible) and the ratio between them is computed for 1969. The pupil distribution percentages were calculated very simply by adding the actual enrollment figures for the three levels of education (including pre-primary where available). Unesco defines the levels as follows:

First level - an elementary or primary school which provides basic instruction in the tools of learning.

Second level - after at least four years previous instruction at first level, a school which provides general or specialized instruction, or both (e.g., middle school, secondary school, high school, vocational school, teacher-training at this level).

Third level - post-secondary institutions which require for admission the successful completion of secondary education.

The allocations of expenditures for each level as given in the Unesco data did not total 100 percent in many cases because administrative costs, special and adult education and other categories are disaggregated for some countries. When this occurred, the percentages allocated to first, second, and third levels were added to give a base of 100 and the proportions were recalculated.

It is interesting to note the median for advanced and less developed countries of the ratios between enrollment and expenditures is very close for the first level but widely disparate for the third.

Ratio between $\frac{\%\ \text{expenditures}}{\%\ \text{pupils}}$

	1st level median	1st level range	2nd level median	2nd level range	3rd level median	3rd level range
More Advanced	0.70	(0.53-1.28)	1.45	(0.52-1.66)	3.19	(1.33-4.86)
Less Developed	0.63	(0.18-0.92)	1.50	(0.74-5.62)	12.42	(3.67-83.67)

In all of the less developed countries the percent of the educational budget spent on third level is and has continued to be very disproportionate as compared to students. Two African countries -- Botswana and Central African Republic -- have no third level educational institutions but spend a sizeable percentage of their budget on grants, scholarships, and bursaries for study abroad.

The percent of student enrollment in first level is, of course, higher in the less developed countries because over the time span studied great effort was directed to make primary education universal. The percent is declining as graduates of primary swell the percent at secondary. The proportion of expenditures is also following this trend in almost all of the countries.

TABLE 2

	Distribution of Pupils and Expenditures						Ratio between % Exp. / % Pupils
	% of pupils			% of expenditures			
	1960	1965	1969	1960	1965	1969	1969
More Advanced							
Argentina							
1	79.5	75.9	74.9	56.8	55.0	41.3	0.55
2	15.6	18.4	19.4	26.5	26.4	31.0	1.60
3	4.9	5.7	5.7	16.7	18.6	27.7	4.86
Czechoslovakia							
1	85.9	82.4	81.8	65.1	66.0	57.5	0.70
2	10.8	12.9	13.5	18.1	12.4	20.9	1.55
3	3.3	4.7	4.7	16.8	21.6	21.5	4.57
France							
1	74.2	66.5	60.2	56.3	36.3	32.1	0.53
2	23.6	29.7	34.6	34.0	44.6	45.2	1.31
3	2.2	3.8	5.2	9.7	19.0	22.7	4.13
Israel							
1	85.3	79.0	75.7	69.4	51.1	45.4	0.60
2	12.0	15.8	17.8	13.7	29.0	29.6	1.66
3	2.7	5.2	6.5	16.9	19.8	25.0	3.85
Italy							
1	69.6	62.7	59.0	46.5	45.8	41.4	0.70
2	27.1	32.9	35.0	39.4	46.5	50.6	1.45
3	3.3	4.4	6.0	14.2	7.7	8.0	1.33
Japan							
1	57.5	47.4	50.2	41.2	43.2	43.1	0.89
2	39.4	47.9	42.3	41.9	44.5	42.7	1.01
3	3.1	4.7	7.5	16.9	12.3	14.2	1.89
Portugal							
1	77.9	71.5	69.9	53.5	48.4	48.1	0.69
2	20.0	25.8	27.1	35.0	38.4	40.3	1.14
3	2.1	2.7	3.0	11.5	13.2	11.6	3.87
Sweden							
1	53.1	49.0	43.9	57.7	55.5	56.2	1.28
2	44.0	46.0	47.5	33.4	31.8	24.6	0.52
3	2.9	5.0	8.6	8.9	12.8	19.1	2.22
United States							
1	70.9	60.4	55.7	80.4	74.1	69.8	0.80
2	21.2	29.9	31.6				
3	7.9	9.7	12.7	19.6	25.9	30.2	2.38
Yugoslavia							
1	84.4	78.7	75.9	62.2	55.6	55.9	0.74
2	11.4	16.5	18.0	20.6	27.8	28.6	1.59
3	4.2	4.8	6.1	17.2	16.7	15.4	2.52

TABLE 2 (con't.)

	Distribution of Pupils and Expenditures						Ratio between % Exp. / % Pupils
	% of pupils			% of expenditures			
	1960	1965	1969	1960	1965	1969	1969
Less Developed							
Algeria							
1	86.9	90.7	89.4	62.6	63.4	66.1	0.74
2	12.3	8.7	10.0	31.0	29.8	24.3	2.43
3	0.7	0.5	0.6	6.4	6.7	9.6	14.00
Botswana							
1	98.2	97.3	95.1	84.0	59.0	65.9	0.69
2	1.8	2.7	4.9	16.0	30.5	24.0	4.90
3					10.5	10.1	*
Brazil							
1	85.8	81.1	75.6	45.8	16.3	13.4	0.18
2	13.1	17.6	22.3	26.8	27 0	16.5	0.74
3	1.1	1.3	2.1	27.5	56.8	70.1	33.38
C.A.R							
1	97.0	96.1	95.5	68.0	63.0	69.0	0.72
2	3.0	3.9	4.5	32.0	30.7	11.8	2.62
3					6.2	19.2	*
Chile							
1	82.6	80.0	85.2	45.6	42.9	38.9	0.46
2	15.7	17.8	11.6	22.8	21.0	17.3	1.49
3	1.7	2.2	3.2	31.6	36.1	43.8	13.69
Colombia							
1	86.7	83.3	80.8	54.2	51.2	48.9	0.61
2	12.2	15.1	16.8	17.9	17.1	20.6	1.23
3	1.1	1.6	2.4	27.9	31.7	30.5	12.71
Dahomey							
1	94.8	91.6	90.3	80.8	78.6	66.1	0.73
2	5.2	8.4	9.6	19.2	20.8	31.9	3.32
3			0.1		0.6	1.9	19.00
Ecuador							
1	88.8	86.0	81.4	46.9	43.6	50.8	0.62
2	9.8	12.4	16.0	29.4	22.3	37.1	2.32
3	1.4	1.6	2.6	23.7	34.1	12.1	4.65
Ethiopia							
1	95.9	86.3	82.0	44.1	47.9	40.8	0.50
2	3.7	12.7	17.4	34.9	32.6	22.2	1.28
3	0.3	1.0	0.6	21.0	19.4	37.0	61.67
Ghana							
1	94.6	94.8	94.2	41.7	41.2	44.1	0.47
2	5.1	4.9	5.5	27.4	28.3	30.9	5.62
3	0.3	0.3	0.3	30.9	30.5	25.1	83.67

TABLE 2 (con't.)

	Distribution of Pupils and Expenditures						Ratio between % Exp. / % Pupils
	% of pupils			% of expenditures			
	1960	1965	1969	1960	1965	1969	1969
Less Developed							
Hong Kong							
1	83.1	77.0	76.3	62.1	60.8	56.7	0.74
2	15.4	21.8	22.0	25.7	26.4	21.0	0.95
3	1.5	1.2	1.7	12.2	12.8	22.3	13.12
India							[1965]
1	88.8	87.0	n.a.	29.5	26.3	25.8	0.30
2	9.8	11.4		49.2	47.6	47.6	4.18
3	1.4	1.6		21.3	26.1	26.5	16.31
Korea (R.)							
1	79.8	78.7	75.4	55.3	74.9	69.2	0.92
2	18.0	19.1	22.2	26.6	23.6	22.0	0.99
3	2.2	2.2	2.4	18.1	1.5	8.8	3.67
Mexico							
1	89.6	86.4	84.3	67.5	62.8	59.5	0.71
2	9.0	12.0	13.9	14.6	18.4	20.8	1.50
3	1.4	1.6	1.8	17.9	18.8	19.6	10.89
Pakistan							
1	75.2	71.2	68.5	43.1	50.6	49.6	0.72
2	22.6	26.0	28.5	30.2	26.7	27.7	0.97
3	2.2	2.8	3.0	27.8	22.7	22.7	7.57
Paraguay							
1	92.5	89.8	87.1	59.2	69.4	67.5	0.77
2	6.5	8.8	11.4	19.0	14.7	14.3	1.25
3	1.0	1.4	1.5	21.8	15.9	18.2	12.13
Peru							
1	86.2	81.7	78.0	64.3	56.9	41.0	0.53
2	11.9	15.1	18.2	27.8	24.6	40.8	2.24
3	1.9	3.2	3.7	7.9	18.4	18.2	4.92
Tunisia							
1	87.8	87.2	85.1	58.9	56.7	53.3	0.63
2	11.7	12.0	14.1	34.2	36.5	39.5	2.80
3	0.5	0.8	0.8	6.9	6.7	7.2	9.00
U.A.R.							
1	80.4	74.5	70.1	82.3	76.9	79.9	0.83
2	16.4	21.8	26.1				
3	3.2	3.7	3.8	17.7	23.1	20.1	5.29
Venezuela							
1	85.8	81.2	76.8	64.8	53.3	42.9	0.56
2	12.4	16.2	19.9	35.2	22.4	24.3	1.22
3	1.8	2.6	3.3		24.3	32.8	9.94

Table 3 gives actual dollar amounts for per pupil recurrent expenditures (again for the years closest to 1960, 1965, and 1969) and ratios between per pupil costs and per capita GNP. Recurrent expenditures include teachers' salaries, instructional materials, building maintenance and administration but do not include capital outlays. The conversion to dollar amounts was calculated with Unesco exchange rates except for Czechoslovakia.[3] All of the conversions naturally must be regarded in the light of the world-wide inflationary changes. Nonetheless, some trends in spending are evident. Though there is wide variation most of the more advanced countries showed a percentage increase in spending over the time span, particularly at third level. Only Portugal in this group showed a decline. This is also true among the less developed. Here the amount spent per pupil at third level is huge for many of the countries and has been increasing rapidly, e.g., Dahomey 112 percent increase from 1960 to 1969. Only four of the less developed countries decreased in percentage of these expenditures. In 1969 14 of the 16 less developed countries spent more than an amount equivalent to their GNP per capita per pupil at third level. In the ten-year time period only seven have gone down in relationship to GNP. In 1969 in the more advanced group only two of the ten countries -- Czechoslovakia and Japan -- spent more than their GNP per capita on recurrent pupil costs at third level. Even taking into account the strong caveat that inflation has played a part in these increases, it is no doubt true that rational allocation of educational dollars is being influenced by political pressure in the crunch for credentials.

[3] The exchange rate as given in J. Wilczynski, The Economics and Politics of East-West Trade, London: Macmillan & Co., Ltd. 1969 (page 99) was felt to reflect more accurately the amounts spent in Czechoslovakia.

TABLE 3

	Public and private recurring expenditure per pupil by level (in U.S. $)			% increase	Ratio between exp. per pupil / GNP per capita		
	1960	1965	1969	1960-69	1960	1965	1969
More Advanced							
Argentina							
1	69	94	44	-36	0.10	0.12	0.06
2	185	254	116	-37	0.27	0.34	0.15
3	295	409	429	45	0.43	0.54	0.55
Czechoslovakia							
1	90	99	141	57	0.11	0.11	0.13
2	174	166	408	134	0.21	0.19	0.38
3	770	895	1291	68	0.93	1.02	1.20
France							
1	100	129	217	117	0.07	0.08	0.10
2	316	379	532	68	0.23	0.22	0.25
3	813	974	1363	68	0.59	0.57	0.65
Israel							
1	98	153	183	87	0.12	0.14	0.15
2	273	175	188	-31	0.32	0.16	0.15
3	--	750	824	[10]	--	0.67	0.67
Italy							
1	217	268	216	0	0.29	0.28	0.19
2	368	416	362	-2	0.48	0.44	0.32
3	429	481	453	6	0.56	0.51	0.40
Japan							
1	67	116	198	196	0.13	0.15	0.16
2	79	127	243	208	0.15	0.16	0.20
3	878	1030	1510	72	1.71	1.32	1.24
Portugal							
1	19	21	23	21	0.69	0.06	0.06
2	77	66	72	-6	0.28	0.18	0.18
3	163	156	131	-20	0.58	0.43	0.32
Sweden							
1	489	633	905	85	0.22	0.27	0.37
2	594	604	1027	73	0.27	0.26	0.42
3	1499	1718	2197	47	0.68	0.74	0.90
United States							
1 & 2	434	507	659	52	0.16	0.16	0.19
3	1344	1792	2044	52	0.49	0.56	0.58
Yugoslavia							
1	25	44	90	260	0.08	0.10	0.16
2	61	115	152	149	0.19	0.27	0.31
3	145	230	308	112	0.46	0.54	0.65

TABLE 3 (con't.)

	Public and private recurring expenditure per pupil by level (in U.S. $)			% increase	Ratio between exp. per pupil / GNP per capital		
	1960	1965	1969	1960-69	1960	1965	1969
Less Developed							
Algeria							
1	44	59	60	36	0.23	0.30	0.29
2	--	257	214	[-17]	--	1.29	1.04
3	952	1243	1309	38	5.04	6.25	6.35
Botswana							
1	15	22	25	67	0.18	0.26	0.29
2	406	336	258	-36	4.95	3.95	3.04
3	--	--	--				
C.A.R.							
1	19	24	29	53	0.17	0.25	0.27
2	204	338	163	-20	1.81	3.45	1.51
3	--	--	--				
Colombia							
1	27	22	11	-59	0.12	0.10	0.04
2	129	91	40	-69	0.58	0.40	0.16
3	835	748	491	-41	3.78	3.31	1.96
Dahomey							
1	45	53	51	13	0.69	0.74	0.73
2	119	147	318	167	1.83	2.04	4.54
3	450	714	952	112	6.92	9.92	13.60
Ecuador							
1	16	19	32	100	0.09	0.10	0.16
2	77	97	158	105	0.42	0.51	0.78
3	280	342	231	-18	1.54	1.79	1.14
Ethiopia							
1	18	20	21	17	0.40	0.38	0.37
2	103	84	69	-33	2.29	1.59	1.21
3	1823	1046	1944	7	40.51	19.74	34.11
Ghana							
1	14	21	22	57	0.09	0.14	0.15
2	202	262	268	32	1.29	1.76	1.80
3	3103	3361	3424	10	19.76	22.56	22.98
Hong Kong							
1	49	66	70	43	0.15	0.13	0.10
2	110	158	156	42	0.32	0.32	0.23
3	1075	1198	1162	8	3.17	2.41	1.72
India							
1	6	7	8	33	0.07	0.08	0.09
2	10	15	14	40	0.12	0.18	0.16
3	164	219	252	54	1,98	2.61	2.80

TABLE 3 (con't.)

	Public and private recurring expenditure per pupil by level (in U.S. $)			% increase	Ratio between exp. per pupil / GNP per capital		
	1960	1965	1969	1960-69	1960	1965	1969
Less Developed							
Korea (R.)							
1	10	13	23	130	0.08	0.11	0.13
2	25	29	24	-4	0.20	0.24	0.13
3	22	30	268	1118	0.18	0.25	1.49
Mexico							
1	31	35	42	29	0.09	0.08	0.09
2	117	123	110	-6	0.33	0.29	0.23
3	324	433	545	68	0.92	1.03	1.15
Pakistan							
1	6	6	7	17	0.09	0.07	0.08
2	9	9	10	11	0.13	0.11	0.11
3	67	59	65	-3	0.94	0.71	0.71
Paraguay							
1	15	17	18	20	0.08	0.09	0.09
2	63	49	62	-2	0.32	0.25	0.30
3	263	350	338	29	1.32	1.75	1.66
Tunisia							
1	33	29	30	-9	0.21	0.15	0.16
2	188	149	162	-14	1.21	0.75	0.84
3	738	469	533	-28	4.73	2.37	2.75
Venezuela							
1	100	103	103	3	0.12	0.12	0.12
2	262	242	267	2	0.32	0.29	0.32
3	1555	1534	1903	22	1.89	1.82	2.27

Using the latest per pupil recurrent costs from the preceding table, index numbers with primary level education as base were calculated. The results as given in Table 4 show even more clearly the disproportionate amounts spent on third level education in the less developed countries. Most of these countries are spending twenty times resources to about one-twentieth the number of pupils. Only two -- Ecuador and Pakistan -- are lower than the highest -- Argentina -- in the more advanced. At second level the same pattern appears, though the disparities are not as large. Six are lower than the 3.1 of Portugal which is high in that group but the median of 3.5 for the less developed is definitely much greater than the 1.7 for the more advanced countries. Lack of data is again pointed up by the fact that primary and secondary disaggregated per pupil costs are not available for the United States. All problems of collection are not in the less developed countries.

TABLE 4

Recurring Expenditures Per Pupil: Index Numbers

	1st level	2nd level	3rd level
More Advanced			
Argentina	1	2.6	9.8
Czechoslovakia	1	2.9	9.2
France	1	2.5	6.3
Israel	1	1.03	4.5
Italy	1	1.7	2.1
Japan	1	1.2	7.6
Portugal	1	3.1	5.7
Sweden	1	1.1	2.4
United States	1*	1*	3.1
Yugoslavia	1	1.7	3.4
Median	--	1.7	5.7
Less Developed			
Algeria	1	3.6	21.8
Botswana	1	10.3	--
C.A.R.	1	5.6	--
Colombia	1	3.6	44.6
Dahomey	1	6.2	18.7
Ecuador	1	4.9	7.2
Ethiopia	1	3.3	92.6
Ghana	1	12.2	155.6
Hong Kong	1	2.2	16.6
India	1	1.8	31.5
Korea (R.)	1	1.04	11.7
Mexico	1	2.6	13.0
Pakistan	1	1.4	9.3
Paraguay	1	3.4	18.8
Tunisia	1	5.4	17.8
Venezuela	1	2.6	18.5
Median	--	3.5	18.6

*1st and 2nd levels combined

Enrollment ratios are given in Table 5. The Unesco method of calculating these ratios is, at first blush, difficult to interpret. Percentages over 100 are common in the more developed countries. The ratio is the total enrollment of all ages divided by the population of the specific age groups which correspond to the age groups of primary and secondary schooling. The result is expressed as a percentage. The ratios were calculated taking into account the differing national systems of education and the duration of schooling at the two levels. At the third level the figures for the population aged 20-24 were used throughout. The total enrollment in first and second levels includes all pupils regardless of age, whereas the population is limited to the range of official school ages. Therefore, for countries with almost universal education among the school-age population at the first level, the enrollment ratio will exceed 100 if the actual age distribution of pupils is greater than the official school ages. In addition to this wide age spread of pupils, some high ratios are caused by figures on enrollment and population data so small that any variation in statistics or any discrepancy between two factors brings about a large change in the ratio.

The relationships across national lines, however, are easier to understand. Trends in the ten-year period are particularly interesting. In the entire group only Ghana experienced a drop in enrollment ratios but, even so, had higher ratios in 1969 than in 1960.

Unesco calculates only total and female enrollment ratios. To obtain male enrollment ratios a demographically unsophisticated equation was used. On the assumption that at the age levels involved the sex groups in the population are, for practical purposes, equal, the following equation was used:

$$\frac{x + y}{2} = z$$

where y = female enrollment ratio and z = total enrollment ratio. The higher male ratios are very evident in, for example, the Arab countries, e.g., Algeria, Tunisia, and the U.A.R. In some of the advanced countries female enrollment ratios are slightly higher at first and second levels. However, in all of the countries male ratios at third level are greater. The sexist pyramid has not been upset.

Total enrollment ratios are increasing. All of the less developed countries are making real progress toward universal primary education and second level enrollment ratios are greater for all twenty over the time span. The ratios for combined first and second level education demonstrate this very clearly. For third level education, in 1969 the ratio in the more advanced countries (except for Portugal) ranges from 11.0 (Czechoslovakia) to a surprising 48 percent for the United States. This is a sizeable increase since 1960 when the range (again except for Portugal) varied from 6.8 for Italy to over 32 percent for the United States. The same pattern emerges for the less developed group at third level -- in 1960 a low of 0.8 for Algeria goes up to 4.7 for Korea and Algeria; in 1969 a low of 0.1 for Dahomey (which had no third level education in 1960) goes to 9.0 for Chile.

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TABLE 5

School Enrollment Ratios

	total			male			female		
	1960	1965	1969	1960	1965	1969	1960	1965	1969
More Advanced									
Argentina									
1 & 2	72	76	80	72	75	79	72	77	81
1	97	101	105	97	100	104	97	102	106
2	31	39	42	30	37	38	32	41	46
3	11.1	14.0	14.0	15.0	16.9	16.2	7.2	11.1	11.8
Czechoslavakia									
1 & 2	78	80	77	79	80	78	77	80	79
1	93	98	96	93	99	95	93	97	97
2	36	39	37	38	35	31	34	43	43
3	11.0	14.0	11.0	14.5	17.2	13.6	7.5	10.8	8.4
France									
1 & 2	90	88	91	89	86	89	91	90	93
1	144	135	120	145	133	120	143	134	120
2	46	56	70	43	53	66	49	59	74
3	7.4	14.0	15.9	8.5	15.8	--	6.2	12.2	--
Israel									
1 & 2	--	80	81	--	79	79	--	81	83
1	--	96	94	--	97	94	--	95	94
2	48	48	56	48	45	52	48	51	60
3	10.2	20.0	19.8	12.4	24.0	22.0	8.0	16.0	17.6
Italy									
1 & 2	66	71	77	71	75	--	61	67	--
1	115	109	106	116	111	--	114	107	--
2	35	47	56	41	52	61	29	42	51
3	6.8	11.9	16.0	9.9	15.8	19.7	3.7	8.0	12.3

TABLE 5 (con't.)

School Enrollment Ratios

	total 1960	total 1965	total 1969	male 1960	male 1965	male 1969	female 1960	female 1965	female 1969
More Advanced									
Japan									
1 & 2	91	92	93	93	94	94	89	90	92
1	102	101	99	103	102	100	101	100	98
2	79	85	88	81	87	89	77	83	87
3	8.6	11.9	15.8	13.8	18.1	22.6	3.4	5.7	9.0
Portugal									
1 & 2	67	71	81	71	75	84	63	67	78
1	87	83	95	89	83	96	86	83	94
2	36	51	60	44	60	67	28	42	53
3	3.5	5.0	6.8	5.0	6.5	7.9	2.0	3.5	5.7
Sweden									
1 & 2	85	92	98	81	90	95	89	94	101
1	95	95	96	95	94	95	95	96	97
2	77	89	100	71	85	95	83	93	105
3	8.0	11.6	18.2	10.6	14.6	22.4	5.4	8.6	14.0
United States									
1 & 2	98	101	107	--	--	--	--	--	--
1	102	104	110	--	--	--	--	--	--
2	86	96	101	--	--	--	--	--	--
3	32.2	40.4	48.1	40.5	49.1	56.7	23.9	31.7	39.5
Yugoslavia									
1 & 2	--	78	77	--	82	81	--	74	73
1	--	94	94	--	99	99	--	89	89
2	34	44	45	41	49	49	27	39	41
3	8.6	13.1	14.6	12.1	17.4	17.4	5.1	8.8	11.8

TABLE 5 (con't.)

School Enrollment Ratios

	total 1960	total 1965	total 1969	male 1960	male 1965	male 1969	female 1960	female 1965	female 1969
Less Developed									
Algeria									
1 & 2	28	39	41	34	48	51	22	30	31
1	46	68	70	55	83	86	37	53	54
2	8	7	9	10	9	13	6	5	5
3	0.8	0.8	1.0	1.1	1.3	1.6	0.5	0.3	0.4
Botswana									
1 & 2	27	44	52	23	40	51	31	48	53
1	42	69	78	36	62	75	48	76	81
2	1	3	7	1	3	8	1	3	6
3	--	--	--	--	--	--	--	--	--
Brazil									
1 & 2	47	56	66	47	56	66	47	56	66
1	100	115	128	99	115	127	101	115	129
2	11	17	25	12	17	25	10	17	25
3	1.6	2.2	4.4	2.3	3.1	5.6	0.9	1.3	3.2
C.A.R.									
1 & 2	18	32	40	29	48	55	7	16	25
1	35	61	75	57	91	103	13	31	47
2	1	3	4	1.7	5	7	0.3	1	1
3	--	--	--	--	--	--	--	--	--
Chile									
1 & 2	69	79	85	71	79	84	67	79	86
1	105	116	106	107	118	105	103	114	107
2	25	33	34	25	31	32	25	35	36
3	4.0	6.1	9.0	5.2	7.7	10.9	2.8	4.5	7.1

TABLE 5 (con't.)

School Enrollment Ratios

	total 1960	total 1965	total 1969	male 1960	male 1965	male 1969	female 1960	female 1965	female 1969
Less Developed									
Colombia									
1 & 2	45	54	59	45	54	58	45	54	60
1	77	88	95	77	86	93	77	90	97
2	12	17	21	13	18	21	11	16	21
3	1.8	2.9	5.0	2.9	4.5	--	0.7	1.3	--
Dahomey									
1 & 2	14	19	21	20	26	29	8	12	13
1	26	35	36	38	49	50	14	21	22
2	2	3	4	3	4	6	1	2	2
3	--	--	0.1	--	--	--	--	--	--
Ecuador									
1 & 2	51	59	64	54	62	--	48	56	--
1	83	91	95	87	94	--	79	88	--
2	12	17	24	14	19	--	10	15	--
3	2.6	3.6	6.5	4.2	5.5	9.3	1.0	1.7	3.7
Ethiopia									
1 & 2	5	7	11	8	10	16	2	4	6
1	8	11	16	12	16	22	4	6	10
2	1	2	4	1.9	3	6	0.1	1	2
3	0.1	0.1	0.2	--	--	--	--	--	--
Ghana									
1 & 2	27	50	39	36	61	43	18	39	35
1	38	69	56	51	84	64	25	54	48
2	2	6	5	3	9	7	1	3	3
3	0.2	0.7	0.7	--	1.3	1.2	--	0.1	0.2

TABLE 5 (con't.)

School Enrollment Ratios

	total			male			female		
	1960	1965	1969	1960	1965	1969	1960	1965	1969
Less Developed									
Hong Kong									
1 & 2	69	75	84	74	78	88	64	72	80
1	93	106	119	99	109	121	87	103	117
2	30	39	45	34	44	50	26	34	40
3	4.4	5.4	5.9	4.9	6.3	7.9	3.9	4.5	3.9
Korea (R.)									
1 & 2	65	72	75	--	77	81	--	67	69
1	96	100	104	--	103	107	--	97	101
2	27	34	38	40	43	46	14	25	30
3	4.7	6.2	7.2	7.8	9.2	10.7	1.6	3.2	3.7
India									
1 & 2	31	41	--	44	55	--	13	27	--
1	42	56	--	58	73	--	26	39	--
2	10	15	--	16	23	--	4	7	--
3	1.7	2.7	--	2.8	4.3	--	0.6	1.1	--
Mexico									
1 & 2	41	60	66	--	64	69	--	56	63
1	89	94	101	--	96	103	--	92	99
2	9	16	22	12	20	26	6	12	18
3	2.6	3.8	4.6	4.3	6.3	7.5	0.9	1.3	1.7
Pakistan									
1 & 2	22	26	29	34	39	43	10	13	15
1	33	40	44	50	58	63	16	22	25
2	11	13	16	19	21	23	3	5	7
3	1.9	3.0	3.6	3.4	5.1	6.0	0.4	0.9	1.2

TABLE 5 (con't.)

School Enrollment Ratios

	total 1960	total 1965	total 1969	male 1960	male 1965	male 1969	female 1960	female 1965	female 1969
Less Developed									
Paraguay									
1 & 2	63	63	65	69	66	68	57	60	62
1	104	103	105	110	108	110	98	98	100
2	10	13	15	15	13	15	5	13	15
3	2.6	3.4	3.6	3.6	4.0	4.2	1.6	2.8	3.0
Peru									
1 & 2	59	73	76	--	81	83	--	65	69
1	89	102	101	--	111	109	--	93	93
2	18	29	38	--	35	44	--	23	32
3	3.6	8.0	10.6	5.3	10.4	13.7	1.9	5.6	7.5
Tunisia									
1 & 2	44	61	66	--	--	84	--	--	48
1	74	102	107	98	131	131	50	73	83
2	11	15	20	--	--	29	--	--	11
3	0.9	1.8	2.1	--	--	3.4	--	--	0.8
U.A.R.									
1 & 2	43	52	52	54	65	65	32	39	39
1	66	74	70	70	89	86	52	59	54
2	16	26	31	23	37	42	9	15	20
3	4.7	6.8	6.9	7.8	10.8	10.2	1.6	2.8	3.6
Venezuela									
1 & 2	70	75	71	71	81	71	69	69	71
1	100	95	98	100	95	98	100	95	98
2	23	30	38	25	31	39	21	29	37
3	4.0	6.3	8.8	5.4	8.4	--	2.6	4.2	--

The last table lists the percentage distribution of pupils in primary education by grade for three time periods. The charts in the working paper depict these percentages graphically for a few countries. All of the statistics for the countries in the sample would paint the same picture: the more advanced the country, the more nearly horizontal the curve that would connect the bars. This data series is quite new and valuable, particularly over time. It tells a great deal about re .tion rate and repeaters. An examination of Table 6 shows that many of the less developed countries are approaching a more horizontal curve during the time period studied. Since at least four years of primary education are considered necessary for functional literacy, the steep slope of pupil distribution in, for example, Colombia must give one pause. Colombia and Brazil are the only countries in the group that consider four years of schooling as primary education. Most of the less developed give six years as primary and Chile increased first level to eight in 1969. The more advanced range from five for Italy to nine for Czechoslavakia. Portugal changed its primary system in 1969 from four years to six.

* * *

As limited as the available quantitative indicators are, the direction for future research is certainly clear. Hard data series, over time, are a must. Comparability across national boundaries must be assured. Countries must be individually surveyed, perhaps by Unesco field reporters as suggested earlier. Qualitative analysis, in depth, to investigate anomalies in trends should be undertaken on a one-country basis. Hopefully, this preliminary gathering and comparing of data will help in pinpointing the problems.

TABLE 6

Percentage Distribution by Grade in Primary Education

Grade	1	2	3	4	5	6	7	8	9
More Advanced									
Argentina									
1960	24.4	16.0	15.8	13.8	11.7	10.0	8.3		
1965	22.7	17.3	15.6	13.7	11.8	10.1	8.9		
1967	22.1	17.0	15.3	13.8	12.1	10.5	9.1		
Czechoslovakia									
1960	12.9	12.9	12.5	12.5	10.7	11.7	11.4	10.3	5.3
1965	10.0	10.7	11.1	11.5	12.0	12.1	11.9	10.9	9.7
1968	10.8	10.5	10.4	10.6	11.4	12.2	12.1	11.8	10.2
France									
1961	20.3	16.0	15.8	16.9	16.3	14.9			
1965	20.1	17.2	16.6	17.5	16.7	11.9			
1968	20.5	18.3	17.7	18.5	17.9	7.2			
Israel									
1960	12.6	13.3	13.7	13.7	12.7	11.5	11.4	11.0	
1965	12.8	12.4	12.7	12.5	12.5	12.2	12.7	12.3	
1968	12.5	12.2	12.8	12.8	12.6	12.8	12.3	12.1	
Italy									
1960	20.5	20.6	19.4	19.6	19.8				
1965	21.6	20.5	20.1	19.5	18.2				
1967	21.6	20.8	20.3	19.1	18.3				
Japan									
1960	14.0	14.8	15.6	17.1	18.9	19.5			
1965	16.5	15.7	15.1	16.7	17.2	17.9			
1969	17.0	16.6	16.5	16.6	17.1	16.2			

TABLE 6 (con't.)

Percentage Distribution by Grade in Primary Education

Grade	1	2	3	4	5	6	7	8	9
More Advanced									
Portugal									
1960	30.5	25.1	23.8	20.6					
1965	30.7	25.3	22.7	21.3					
1969	24.1	21.1	21.1	20.4	3.9	1.6			
Sweden									
1960	16.1	15.9	15.9	16.5	17.5	18.0			
1965	16.4	16.8	16.8	16.6	16.3	17.1			
1968	16.6	16.3	16.6	16.6	16.9	17.0			
United States									
1961	14.5	13.4	12.9	12.6	12.1	11.5	11.7	11.3	
1965	14.1	13.1	12.9	12.5	12.1	11.9	11.9	11.5	
1968	13.5	12.9	12.7	12.5	12.3	12.2	12.2	11.7	
Yugoslavia									
1960	15.8	15.9	14.8	15.2	12.8	11.2	8.3	6.0	
1965	14.4	13.5	13.7	13.7	13.4	12.1	10.7	8.4	
1968	14.7	14.1	13.7	13.4	12.9	11.8	10.6	8.9	
Less Developed									
Algeria									
1964	24.7	27.3	17.6	12.0	9.2	5.3	3.9		
1965	20.2	28.4	19.8	13.2	9.3	5.3	3.8		
1968	18.5	17.8	19.1	20.9	12.5	6.1	5.1		
Botswana									
1960	32.0	20.8	16.3	12.0	7.8	6.0	5.1		
1965	26.4	20.6	17.2	13.0	9.0	7.2	6.6		
1969	17.9	20.4	18.2	15.5	12.0	9.1	6.8		

TABLE 6 (con't.)

Percentage Distribution by Grade in Primary Education

Grade	1	2	3	4	5	6	7	8	9
Less Developed									
Brazil									
1961	53.1	21.8	15.5	9.7					
1965	52.1	21.6	15.7	10.6					
1968	49.8	21.5	16.8	11.8					
C.A.R.									
1960	39.7	21.1	15.8	10.9	6.7	5.9			
1965	38.8	19.6	14.5	10.6	8.6	8.0			
1967	37.4	20.5	14.5	10.7	8.8	8.2			
Chile									
1960	30.0	19.8	17.2	14.2	10.7	8.2			
1965	29.1	19.3	16.9	14.4	11.3	9.0			
1968	20.9	17.0	15.3	13.5	11.1	9.0	7.0	6.3	
Colombia									
1960	46.1	26.5	13.3	8.4					
1965	40.5	25.2	15.4	10.7					
1968	38.6	24.1	16.4	11.6					
Dahomey									
1961	28.5	19.6	16.7	14.0	11.2	10.2			
1965	27.1	19.5	15.9	12.6	12.6	12.4			
1968	25.4	18.9	16.4	13.8	13.1	12.5			
Ecuador									
1960	36.8	21.0	16.5	11.6	7.9	6.2			
1965	32.7	20.6	16.9	12.9	9.5	7.5			
1968	29.5	19.8	16.6	13.9	11.0	9.2			

TABLE 6 (con't.)

Percentage Distribution by Grade in Primary Education

	Grade 1	2	3	4	5	6	7	8	9
Less Developed									
Ethiopia									
1960	41.5	20.6	14.8	10.8	7.0	5.1			
1965	36.0	21.4	16.4	11.6	8.3	6.3			
1968	31.8	19.3	16.8	13.4	10.5	8.5			
Ghana									
1960	24.2	18.4	16.5	14.9	13.5	12.5			
1965	24.0	19.7	17.9	16.0	13.8	8.6			
1968	19.6	16.5	16.0	16.5	16.0	15.4			
Hong Kong									
1960	23.4	17.9	17.8	15.7	14.4	10.8			
1965	25.9	17.7	15.0	15.8	14.3	11.3			
1968	23.0	18.8	17.9	16.6	13.5	10.2			
Korea (R.)									
1963	20.7	20.1	16.9	15.0	15.4	11.8			
1965	20.0	17.9	17.1	17.2	15.2	12.6			
1969	18.0	17.6	17.8	16.2	15.8	14.6			
India									
1960	38.3	21.5	16.8	13.1	10.3				
1965	37.4	21.3	16.9	13.6	10.7				
Mexico									
1960	38.6	21.8	15.1	10.4	7.7	6.3			
1965	33.0	21.5	16.2	12.1	9.5	7.7			
1969	30.1	20.0	16.9	13.5	10.8	8.7			

TABLE 6 (con't.)

Percentage Distribution by Grade in Primary Education

Grade	1	2	3	4	5	6	7	8	9
Less Developed									
Pakistan									
1960	43.7	21.0	14.8	11.5	9.0				
1965	35.9	2.16	17.2	14.0	11.4				
Paraguay									
1961	36.7	23.6	16.3	11.1	7.4	5.0			
1965	33.3	23.6	16.8	12.1	8.3	6.0			
1968	30.1	23.7	17.3	12.8	9.2	6.8			
Peru									
1961	33.1	20.9	16.0	12.8	9.8	7.4			
1965	31.7	20.5	15.4	13.4	10.8	8.2			
1968	28.8	20.0	15.7	14.2	11.8	9.5			
Tunisia									
1960	25.9	20.7	18.3	15.3	12.0	7.8			
1965	23.7	19.4	17.9	15.4	13.2	10.4			
1970	20.0	18.7	17.0	15.4	14.5	14.4			
U.A.R.									
1960	20.2	18.8	18.3	14.2	14.3	14.2			
1965	19.6	17.8	17.0	15.6	14.0	16.0			
1968	19.1	17.3	16.3	16.3	14.7	16.2			
Venezuela									
1960	37.9	21.2	15.8	11.1	8.1	5.8			
1965	28.4	19.7	17.2	14.3	11.5	8.9			
1968	24.7	19.4	18.6	15.6	12.2	9.5			