Economic Evaluation of Nonformal Education in Rich and Poor Nations

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This paper sets forth the methods and results of several economic evaluations of nonformal education which have been undertaken in the United States in recent years, and it offers some thoughts on the applicability of methods and results to nonformal education in poor countries.

It employs the term "nonformal education" in the way used in W. Steen McCall's background paper of November 23, 1970, for this panel: "the entire range of learning experiences outside of the regular, graded school system." My concern with nonformal education so defined does not imply acceptance of occasionally voiced premises that nonformal education will "succeed" where formal education has "failed," that formal and nonformal education are substitutes for each other and need appraisal only for relative cost-effectiveness, or that nonformal education can be expanded with less strain on a nation's investment resources than can formal education. The degree of validity of such premises is essentially an empirical matter to be subjected to the test of data. A recognition that nonformal education is an economically very important activity in the United States, with some apparently favorable effects, suffices to justify subjecting this activity to policy analysis and research.

Economic Evaluations in the United States

Economic evaluation in the United States has been applied only to selected types of nonformal learning experiences.[1] Three such types will be covered in this paper.

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[1] A handy guide to the growing literature on economic evaluations of formal and nonformal education has been prepared by Wood & Campbell (1969). For descriptions of U.S. manpower programs, a component of nonformal education, see the Manpower Report of the President. Washington, D.C.: U.S. Government Printing Office, annually.

Institutional retraining of manpower. Holding no patent on an international "first" the United States commenced in the beginning of the 1960's a large and growing program for occupational training of adult workers, usually unemployed or seriously underemployed, in vocational schools and other training facilities not owned and operated by employers. This institutional, occupationally oriented training program, sponsored by the federal government under the Manpower Development and Training Act (MDTA) and the earlier Area Redevelopment Act (ARA) or by state governments under state legislation, has been evaluated in West Virginia, Tennessee, Massachusetts, Connecticut, and Michigan.[2]

The West Virginia study by the Somers group (1968) covered ARA and state sponsored courses largely designed to prepare workers for semi-skilled manufacturing and service occupations: riveters, welders, machine tool operators, auto repair men, construction workers, nurse's aides, clerical workers, etc. The courses took place in an economically depressed area with an economic base of manufacturing, mining, and some agriculture and with an unemployment rate ranging from 6.0 to 23.5 per cent depending on year and locality. Average class length was 3.2 months for men and 2.2 months for women covered in the study but with only a small number of classroom hours per week.

Data were obtained mainly in personal interviews with persons who entered, or sought to enter, a selected set of training courses and with a sample of persons who had filed or renewed job applications with the state employment service in the area during the year before a course was started. Instructional cost data were obtained from the state government.

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[2]For a detailed comparison of these studies see Hardin (1969).

Several reports differing in criteria of evaluation and in details of coverage and statistical method were prepared, and results differing somewhat across reports were accordingly obtained. Three reports contained estimates of the social economic benefits from training, measured as the increase in annual earnings attributable to training. Cain & Stromsdorfer (1968) found first-year annual economic benefits of training of $1,008 per man and $192 per woman, with an average of $736 per graduate. Stromsdorfer (1968) found annual benefits of $828 per male and $336 per female graduate. Gibbard & Somers (1968) classified the sample not only by sex but also by age and years of formal schooling and estimated training gains in annual before-tax earnings ranging from a high of about $1,200 to a low of approximately zero depending on subgroup, but the subgroups were often too small for reliable analysis.

While Gibbard & Somers had few results on social economic costs of training, Cain & Stromsdorfer calculated the total social economic costs as $918 per male and $527 per female graduate. However, these cost elements included two types of transfer payments: welfare payments and training and subsistence allowances. When these are disregarded, as should be done in a social economic analysis fundamentally concerned with impact on national product, the costs of training consisting of pre-tax earnings lost while in training and of the direct instructional and administrative costs are substantially lower: $789 per male trainee and $401 per female trainee.

Thus, the annual economic benefits from training as calculated by Cain & Stromsdorfer were 128 per cent of total social economic costs (as revised by me) in training of men and 48 per cent in training of

women. Based on the Stromsdorfer results they were 105 per cent for men and 84 per cent for women. For each sex and according to each study the initial investment of society was recovered in two years or less. If benefits lasted for ten years but were discounted at ten per cent per year, the benefit cost ratio was between 6.5:1 and 7.9:1 in training of men and between 3.0:1 and 5.2:1 in training of women. The benefit-cost ratios were naturally higher, by 50 to 60 per cent, if one accepts the Cain & Stromsdorfer assumption that the annual benefits continued until retirement, 36 years later for men and 26 years later for women, and even higher if one uses lower discount rates. These results represent very handsome economic rates of return on society's investment in training.[3]

The Gibbard & Somers study and the Stromsdorfer study show that a very favorable employment impact is a major explanation of the training-related gain in annual earnings. According to the former study there was an employment increase of about 15 weeks per graduate as a result of the course, while the latter study estimated the training-related employment gains as 10-11 weeks. The study of Tennessee retraining which was conducted by Solie (1968) on four 16-week training courses and by methods similar to those of the West Virginia studies showed an average employment

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[3]Cain & Stromsdorfer also calculated private economic benefits and costs of training. Among the benefits they included not only the training effects on after-tax earnings and transfer payments but also the impact on voluntary leisure, valued at the weekly earnings on the last job before the person left the labor force voluntarily. This valuation procedure implies that initially involuntary leisure has zero value and that a given stretch of nonwork time never changes between being voluntary and involuntary. However, it is very likely that highly favorable private economic returns on the training of men would also emerge, even if Cain & Stromsdorfer were to remove the value of leisure time from their calculations.

gain of 6.5 weeks, an average unemployment reduction of 4.1 weeks, and consequently a 2.4 weeks average increase in labor force participation. The implication that the gains in earnings resulted more from increased employment than from increased earnings while employed is also supported by the Borus (1964) study of retraining in Connecticut.[4]

The Michigan study by Hardin & Borus (1971) covered MDTA and ARA sponsored institutional training courses for a broad range of occupations, including those studied in the West Virginia project. Each designed for a single occupation the courses in the study took place in the early 1960's in Detroit, other large urban areas, and small towns in Michigan. The economic base of the local economy included auto production and other durable and nondurable manufacturing, government and private services, trade, agriculture, and mining. Some labor markets (the Upper Peninsula of Michigan) were chronically depressed, some suffered from a recession which heavily affected durable goods production, and some had a relatively high level of economic activity. The unemployment rate in the year before each training class in the study ranged from 2.9 to 19.1 per cent depending on locality and year.

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[4]The Borus study of Connecticut retraining has attracted widespread attention by reporting social-economic benefit-cost ratios which range from 73.3:1 to 137.3:1 depending on circumstances. It embodies a set of assumptions which differ from those of many other studies and entail unresolved methodological issues. Ribich (1968) and Hardin (1969) have attempted to reconcile his results with other evaluations. Their reconciliations show highly favorable, albeit not spectacular, benefit-cost ratios in the order of 6:1 to 15:1.

Retraining in Massachusetts was analyzed by Page (1964) who reported a social-economic benefit-cost ratio of about 6.2:1, which Ribich and Hardin independently adjusted to the neighborhood of 4:1. Given its very narrow data base the Page study can only be said to be consistent with other findings of high social-economic benefit-cost ratios from occupational training.

The Hardin & Borus study differed from the West Virginia studies in several ways. First, it evaluated retraining on three basic criteria: social economic (national product), private economic (disposable income), and government budget (government cash outlays and receipts). Second, it put heavy stress on ascertaining the relationship of economic benefits and costs to the characteristics of courses, trainees, and local labor markets. Third, as part of its concern with the differential impact of training, it analyzed the role of the length and quality of training to the magnitude of economic effects.

The Michigan study resembled the West Virginia, Tennessee, and Massachusetts studies in being highly dependent on the use of personal interviews for collection of data on earnings, employment, and other matters relevant to economic benefits and costs. However, a substantial amount of information was also obtained from government records. The tax effects of training, important for calculation of the impact of training upon disposable income and upon government net cash receipts, were estimated from tax-rate schedules.

Unlike the West Virginia project it calculated training effects from the difference between entrants into training (dropouts and graduates combined) in a set of courses and persons who had the qualifications and desire to enter the same courses but did not enroll. The choice of entrants as treatment groups was based on the realization that both dropouts and graduates are given at least some training and auxiliary services, which enter the cost of training, and that dropouts may be affected positively or negatively by their incomplete participation.[5]

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[5] In particular, some entrants learn the critical skills at an early stage and see no merit in continuing the course after that time.

The choice of qualified, interested nontrainees instead of a sample of the general population which training courses are meant to serve rested on two main considerations. First, occupations differ in demographic composition (sex, education, age, race, etc.), and the MDTA and ARA courses were each designed for single occupations. Second, enrollees for training in specific courses must be supposed to want employment in the corresponding occupation, to have most of the characteristics of its incumbents, and to be a differentiated selection from the general target population.[6]

The most striking finding of the Hardin & Borus study was that short training courses, ranging from 60 to 200 hours per enrollee, had very favorable economic effects. Before-tax annual earnings rose by an average of $976 per entrant into short training. The social economic cost of training, composed of instructional and administrative costs, reduced before-tax earnings during training, and trainee expenses, in short courses amounted to only $346 per entrant. Since annual economic benefits to society were about 2.8 times larger than total social economic cost, the economic returns from short training were magnificent. This is also indicated by the benefit-cost ratio, which with a ten-year service life and a ten per cent discount rate amounted to 17.3:1 for short training.

Further analysis showed that the economic returns from short training varied with the demographic characteristics of trainees. In particular, when adjusted for exact course length, training of persons

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[6]The conclusion that qualified interested nontrainees have different demographic characteristics depending on the training course which they do not enter was actually supported by project data.

with more years of formal education meant lower social-economic returns than training of persons with less education.[7] However, the benefit-cost ratios for short training were all far above unity, ranging from 9:1 to 30:1 depending on sex, race, educetion, prior earnings, welfare recipient status, and training occupation. Thus, it was very profitable for society to retrain disadvantaged as well as advantaged groups in short courses.

The economic benefits from short courses were also very substantial for the individual trainees. Largely because of training allowances, the trainees did not lose any disposable income during the course, and on the average they gained $743 of annual disposable income after the course. The presence of an attractive economic reward and the absence of investment barriers to training was a feature of all subgroups of short training, although the benefits and costs naturally varied somewhat from one subgroup to another.

Short courses were not only very beneficial to national product and to the disposable income of trainees but also to the cash position of the government. Government outlays of cash, covering increased transfer payments and reduced tax collections during class and the costs of instruction and administration, amounted to $404 per trainee. Annual gains of cash after training, composed of reduced unemployment benefits and welfare payments and increased tax receipts, were $275 per trainee, or about 68 per cent of total government cash expended per

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[7] Very few trainees had fewer than eight years of formal education, and mean schooling was 11 years at class start. Extrapolation of the relationship to education ending far below the eighth-grade level would be hazardous.

trainee. Thus, short training had the additional desirable feature of being self-liquidating and, indeed, generating a substantial cash surplus starting not more than two years after the end of training.

In contrast, medium and long training, represented by classes designed for 201 - 1,920 hours per enrollee, gave dismal economic results. The social economic benefits were numerically negative but should perhaps be regarded as approximately zero. The social economic cost of training was substantial, ranging from $885 per trainee in 201 - 600 hour classes to $3,293 in 1,200 - 1,920 hour classes. No demographic subgroup was found in which society obtained positive annual benefits exceeding 15 per cent of total cost from medium and long training.

Since the social economic benefits are dominated by the before-tax earnings gain, the private economic benefits from medium and long training were also mostly dismal. Only whites with less than 12 years of formal education, representing one-fourth of the sample, obtained significant rewards for enrolling. Blacks lost disposable income during training and also lost substantial amounts of disposable income after training, attributable in part to a sharp reduction in welfare payments after the class.

Medium and long training generally worsened the cash position of the government, the annual gains being less than one per cent of the total outlays. However, the losses of disposable income among blacks were also reflected in positive annual gains of cash from blacks after the class.

These evaluations from the Michigan study carry important policy implications. If the economic goal of retraining is to raise national

product as well as the disposable income of trainees without burdens on the cash position of the government the United States should not only continue but also expand its short training program. Although some resources may be obtained from outside the training area, the most obvious source is the medium and long training program. A transfer of resources from the medium and long to the short courses would add greatly to national product, turn private losses into private gains, make the program self-liquidating and cash-generating, and enable the government to aid a significantly larger proportion of the target population with a given total effort.

It would be unwarranted to recommend a complete transfer of resources from medium and long training into short classes, even if one has no reservations about the validity of the computed benefit-cost ratios. Since the social cost of training was about 3.7 times as high as medium and long as in short classes and since the majority of MDTA-AIM trainees in Michigan and in the nation were in medium and long training, there would be a manyfold increase in short-training enrollment. The training facilities could no doubt adapt to this redistribution of effort after appropriate notice. It is less certain that the labor markets for which short courses were designed, or could be designed, would be able to absorb the great increase in trainees. The benefit-cost ratio for short training might decline significantly, and it is also possible that benefit-cost ratios for medium and long training would rise in response to the reduction in that program. Compulsive caution in making policy recommendations, not a fear that the government will move with excessive speed, prompts me to add that the transfer of

efforts from medium and long training into short training should be accompanied by a close monitoring of the labor market success of persons trained in short classes.

On-the-job training. Private and public employers have long trained their employees in job skills, and most of this training has been done at the work place or at least on establishment premises. Looking for an alternative to institutional occupational training such as studied in West Virginia and Michigan, the federal government has attempted in recent years to encourage private employers to arrange training programs for their low-skill employees and also to train newly hired employees without any definite commitment or promise of long-term employment. In a sense the federal government is attempting to purchase training for low-skilled groups from private employers.

Few economic evaluations of these forms of on-the-job (OJT) training appear to have been published. The study by Scott (1970) of the Bureau of Indian Affairs (BIA) training program in Oklahoma is an exception.

Nine employers who in the period 1960-1966 signed contracts with the Oklahoma BIA for on-the-job training of Indians were covered in the study. Fearing that there exists an important systematic difference in motivation between trainees and control groups of the kinds used in the West Virginia and Michigan studies, Scott rejected the control group approach and based his benefit calculations on before-after differences in earnings and other relevant variables for a sample of Indians who did enter OJT programs. Specifically he compared (a) the monthly earnings in the job held two years after training with the monthly earnings in the last job

before entering training and (b) after-training employment with before-training employment. In both comparisons he attempted, rather unsuccessfully, to adjust the after-training variables for demographic and labor market variables which, changing over the course of time, can be expected to influence the magnitude of the before-after difference. The average adjusted before-after change in annual earnings was found to be $1,970 after taxes. Since Scott assumed that no earnings were lost during training and since the Indians were apparently not eligible for any transfer payments, no private benefit cost ratio could be calculated, and the net present value accruing to trainees, given a ten per cent discount rate, ranged from $7,500 to $19,000 depending on assumed service life.

The impact on before-tax earnings was used as a measure of annual social economic benefits. The BIA administrative costs were one of two components of social economic costs. On the explicit assumption that there were no earnings lost during training but possibly some gains and on the implicit assumption that the employers used the entire BIA subsidy payment to supply training, the BIA subsidies to contracting employers were included as the other component of social economic cost. The net results were an annual benefit of $2,034 per trainee, and a total social economic cost of only $1,010 per trainee, and a benefit cost ratio ranging from 7.6:1 to 19.5:1 given a ten per cent discount rate and five or thirty-five years of service life.

Unfortunately, there may be less content in these findings than meets the eye. Changes in economic activity and general wage levels, spontaneous decisions to enter or leave the labor force, and regression toward the mean all affect the behavior of annual earnings over the course of time. Unless there is a sharp reduction in economic activity, certainly not a feature of the 1960-1966 period, the effect of these

forces is likely to be an increase in annual earnings and, hence, an overstatement of the economic gains from the BIA program. Furthermore, it is not obvious whether coverage by the BIA program was a cause or an effect of being hired: there are indications that some employers first hired Indians and then ascertained whether subsidies would be paid, and it might be supposed that some members of the sample would have been hired and retrained even without the BIA program. Moreover, the Scott report makes it clear that the contractual training period for which subsidies were paid greatly exceeded, according to trainee opinions, the actual learning time and that skills were acquired more by learning from doing than by exposure to systematic training. One may wonder how much of the subsidies represented compensation to employers for increased scrap, machine breakdowns, and other interferences with production, which was a proper component of the social economic cost of the program, and how much was a simple windfall gain. Finally, the federal law under which the BIA program operated officially tied the wage subsidy feature to the existence of a training program. This linkage probably made it impossible for Scott to compare the before-after change in earnings under the combined program of OJT and wage subsidies with the before-after change under a pure wage subsidy program, and no conclusions can be drawn about the impact of the OJT component by itself or as an addition to the subsidy program.

The Neighborhood Youth Corps program. The Economic Opportunity Act of 1964, with the task of mobilizing human and financial resources to combat poverty, established the Neighborhood Youth Corps (NYC) which has now grown to be the largest federal manpower training program in the

United States. By creating useful work experience opportunities for unemployed youth it seeks to make enrollees more employable or to enable them to resume or continue their formal education. The out-of-school program of the NYC serves primarily the school dropouts. An economic evaluation of this part of the NYC program was made by Borus, Brennan, and Rosen (1970).

The study covered NYC programs in five cities in Indiana, two of which added remedial education to work experience projects. Most of the jobs were with government agencies, but some were with nonprofit private organizations or community organizations. The enrollees worked as aides, assistants, or helpers to regular full-time employees, and they normally had a range of work stations among which to choose. There was apparently no scheduled length of participation: entrants could remain in the program for short or long periods of time.

The annual benefits from the NYC out-of-school program were defined in terms of impact on earnings after end of participation.[8] Data on earnings in calendar year 1967 were obtained from the Indiana Employment Security Division and showed total earnings from all Indiana employers who were covered by the state unemployment insurance system, about two-thirds of the entire work force of the state but a higher proportion in urban areas. Excluded were employers of three or fewer persons,

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[8]This choice was consistent with one goal of the NYC program: increased employability. The degree to which the other goal, resuming or continuing formal education, was attained by the program was not analyzed, and those members of the initial sample who were known to have obtained additional education or training were eliminated from both experimental and control groups.

agricultural employers, nonprofit organizations, and governments. Domestic work, family employment, and self-employment were also excluded.[9]

Earnings data and demographic information were obtained for trainees who enrolled in the NYC out-of-school program, reported for work at least one day, and left the program before calendar year 1967. The same kind of information was obtained on a control group composed of persons who applied for the NYC program before 1967 and were found qualified but did not enroll because they were not called, could not be reached, or did not report. The initial trainee and control groups were reduced because of subsequent training or experience, entry into military service, move out of the state, presence of serious handicaps, or death.

Multiple regression analysis showed that, when a number of demographic variables were held constant, the person's total earnings in 1967 varied linearly and positively with hours of participation in the program. The effect of an additional hour of participation varied with sex and formal education, being higher among men than women and also higher among those with 9-10 years of education than either more or less schooling. While men gained a great deal from participation, women gained very little.

The social economic benefit cost ratios for men, based on a ten-year service life and a ten per cent discount rate, ranged from 1.8:1 to 7.4:1 depending on years of formal education and on assumptions

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[9] Conducting the NYC projects in urban areas probably helped improve the coverage of earnings reports, but provision of work experience with governments and nonprofit organizations may at the same time have steered many enrollees into these non-covered employment areas after the end of NYC participation.

concerning forgone earnings during participation, about which no data were available for enrollees or definable for control group members. For training of women the ratios ranged from zero to 2.1:1. These findings suggest that there were substantial economic net benefits, at least in terms of current earnings, from arranging NYC out-of-school programs for men, especially those who dropped out in the early years of high school, but that little was gained from such programs for women.

Implications of U.S. Evaluation Efforts for Poor Nations

What do these evaluation efforts in the United States[10] mean for economic evaluation of nonformal education in the less developed countries?

First, nonformal education does appear to yeild a significant economic return on investment of productive resources, improves the economic well-being of recipients of such education, and possibly generates enough cash for the government to avoid heavy borrowing or taxation to finance the educational activities. However, the American experience is simply an illustration that conditions did exist which permitted a favorable economic impact of nonformal education. Only further analysis, including on-site exploration and experimentation, can tell us whether and where such conditions do exist in other nations, rich and poor.

Second, substantial progress has been made in devising methods, but there remain many issues and problems to resolve before economic evaluation of human resource programs in the United States becomes a fully valid and well established routine activity.[11] Certainly there does not

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[10] For practical reasons my survey of evaluation efforts was confined to the United States, and only a limited number of these evaluations were actually discussed. However, evaluation work is also done in Canada, European countries, and other nations. There is a need to take stock of all results obtained and methods employed.

[11] See Cain & Hollister (1969), Hardin (1969), and Somers & Wood (1969).

exist a box of tested and true tools ready to be shipped abroad with instructions for assembly and use.

Some lessons may be learned and some suggestions may be offered in spite of the tentative and primitive state of our method and findings. Readers and listeners will no doubt have knowledge and experience to guide them in sorting out that which might have promise in other countries and discard that which probably does not.

Economic evaluations may be undertaken both as an important phase of basic economic research and as an aid in policy analysis and policy-making. The choice of aim will influence somewhat the nature of both topic and procedure of evaluation. My suggestions are selected from a policy orientation.

Relating evaluation to policy. The economic evaluation capabilities of any nation, rich or poor, are too limited to deserve being engaged on problems the resolution of which will not be influenced by evaluation findings. Consultation with planners and decisionmakers before evaluations commence may help evaluators avoid programs which will be retained or abandoned as a result of purely independent considerations. It may help them choose economic criteria of evaluation which are likely to have policy significance instead of merely reflecting their personal preferences. Such criteria include the choice both among indicators (gross national product, disposable income, employment, unemployment, etc.) and among alternative discount rates and service lives. Consultation may help evaluators ask questions about differential program efforts which bear on an opportunity for choice instead of assessing the merits and demerits of a practical necessity.

The nature of organizational arrangements which are most conducive to appropriate interrelations between economic evaluation and policy-making will differ from nation to nation. Evaluation work may be subcontracted to independent groups or institutes, perhaps located in universities; it may be carried out in a central policy planning agency; or it may be conducted in staff units of individual operating ministries or agencies. The general structure of government organization, the availability of specialized talent, the need for access to data which cannot be released to nongovernmental users, and the general feasibility of research in government agencies may influence the choice of organizational arrangements for economic evaluation. It may be very useful to make evaluation reports available to all interested persons and to solicit or at least facilitate comments and appraisals from scientific and other groups.

Some questions to be answered in evaluations. It is unlikely that a nonformal education program, except a very limited one, has the same economic effects in all its components, on all its target groups, and in all its environmental settings. When the effects depend on circumstances, there is an opportunity for reallocation of resources toward areas of more favorable effects. One of the tasks of an evaluator is to look for variations in effects, to estimate their magnitudes, and generally to provide information for assessing the economic desirability of a within-program transfer of resources. The value of information on differential effects is generally high, and its extra cost is relatively modest.

The relationship between size of treatment effect and length or intensity of treatment has great significance for policy in a nation where available resources do not suffice to give everyone a thorough education. A broad distribution of the benefits of nonformal education is possible without significant loss of aggregate output, if the benefit-cost ratio is independent of the length or intensity of education. If the ratio rises with increased length of education, a given aggregate of educational resources will tend to be concentrated for the use of fewer persons, while the reverse tends to occur if, as in the Michigan study, the benefit-cost ratio declines with increased length of education.

A second relationship of importance is the impact of formal schooling on the benefits from nonformal education. The Michigan finding that the earnings gain from occupational retraining declined with increased formal education might seem to suggest that nonformal and formal education are good substitutes for each other and that the choice between the two is merely one of relative cost effectiveness. However, the Indiana study indicated that the benefits from nonformal education of the NYC type actually rose with formal education, until the enrollee reached the early years of high school. Finally, the eligibility tests for Michigan retraining courses frequently included attainment of at least eight, at times twelve, years of formal schooling. Thus, the empirical evidence as to substitutability between formal and nonformal education is quite mixed, even after one disregards the fact that instructors and administrators in many nonformal education programs may require much formal education in order to do their jobs well. Assigning relative priorities to formal and nonformal education remains a difficult task.

A third matter of some importance is the impact of the economic environment upon the economic effects of nonformal education. Although earnings of semi-skilled and unskilled workers, the main targets of manpower training programs, are naturally high in periods of general economic prosperity, it does not follow automatically that training raises earnings by a greater amount in prosperity than recession. Similarly, it is not obvious that training raises earnings more in economic expansion than in economic contraction. In their Michigan study Hardin & Borus were unable to detect any impact of unemployment levels, unemployment rate changes, or the rate of nonfarm employment growth upon the earnings gains from training, which leaves an implication that the cyclical timing of manpower retraining has no impact on the gains from training, although it may affect the opportunity costs of training. However, until more findings are available on this matter, it remains difficult to specify the general economic conditions and the general economic policy under which nonformal education has its most favorable economic effects.

Some field survey requirements. Detailed data on employment and earnings are usually crucial raw materials for economic evaluations. Such data are often difficult to obtain from government sources: wage-reporting data at the state level in the United States (Borus, Brennan & Rosen, 1970) do not exist in all states of the U.S. and do not include all employers in covered states; social security data have a ceiling on reported amounts; and income tax returns filed jointly do not necessarily show earnings separately for each spouse. In addition, these data files may be closed to evaluators, and they contain no real employment

information. Elaborate field surveys, with personal interviews or mailing of questionnaires, usually become necessary.

The skills required for effective field surveys differ from those needed in statistical analysis and economic interpretation. In the United States many economic evaluators have learned sampling methods; construction of interview schedules and mail questionnaires; selection, training, and supervision of interviewers and other field representatives; and data editing and coding. Since skills of this kind are required in field surveys regardless of evaluation and research topic, it seems that developing nations should try to develop national field survey institutes, possibly within census bureaus and central statistical offices, and relieve the economic evaluators of the direct burden of field operations. Better data, lower cost of data collection, and quicker reporting of results are among the potential benefits of such a rearrangement.

Observation units. The predominant approach in economic evaluations of human resource programs to date is to use the individual person (trainees and nontrainees) as the unit of observation: the analysis has essentially been designed to answer the question, "What happened to the earnings, employment, etc., of the trainee and what would have happened, if he had not enrolled for training?" Although quite correct when the concern of the evaluator is with the group of persons trained, this approach may become misleading, when the evaluator is also concerned with the impact on other parties.

The effect of a training program upon aggregate earnings of the community is not necessarily identical with the effect on the aggregate earnings of the trainees: trainees may displace other persons into unemployment, or they may fill shortages that would otherwise have persisted.

and may vacate jobs subsequently filled readily by the unemployed. The trainee earnings gains exceed the community gains in the first case and fall short of it in the second case.

Some authors have attempted to allow for such "displacement" and "vacuum" effects by adjustments based on certain assumptions, but lack of corroboration of assumptions make these well-meaning efforts unconvincing. We may learn in due time that nothing less than broadening the unit of observation to encompass the local labor market where the educational activity takes place will effectively allow for displacement and vacuum effects. The person whom the trainee displaces is likely to be located in the same labor market, and the job he vacates is also likely to exist in that market. Thus, the changes in labor market employment and earnings attributable to training may be a more adequate representation of the net aggregate impact of training than is the impact upon the trainees.

However, use of the local labor market as the unit of observation also entails problems. First, training program enrollment in a local market is normally very small compared with market size, and extraneous variations in employment and earnings are likely to overshadow program effects. Second, assessment of market changes require use of expensive sample surveys, when routine reports to government agencies are not available. Third, since a program with voluntary participation normally cannot survive, if the participants fail to obtain personal rewards, an evaluation of the private economic benefits and costs remains a desirable part of an economic evaluation which assigns highest priority to national product effects. The labor market approach may have to be

augmented with a study based on the current treatment-group approach, unless the treatment program is very large.

Control group design. The measurement of training program effects requires knowledge both about the treatment group and a group fully comparable except for not being treated. Finding such a fully comparable control group is a major problem. Most evaluations of training rely either on qualified, interested persons or on persons representative of the target population. In either case there are systematic between-group differences which affect the variable of concern to evaluation, and statistical methods are employed to remove the effects of such differences, before the treatment effect is calculated. However, the two groups may differ in unknown or unmeasured factors affecting the evaluation variable, and the resulting biases cannot be removed by statistical control.

As economic evaluations and basic research add to our understanding of the forces which govern employment, earnings, and other variables relevant to evaluation studies, we gain increased ability to choose appropriate control groups, to identify and measure important control variables, and to incorporate the control variables in an appropriate mathematical form. However, until a reasonably complete understanding is reached, control group biases cannot be removed, unless members of a common sample or population of potential recipients of treatment are assigned by random methods into an experimental (treatment) group and a statistically equivalent control group.

The principle of randomization has long been recognized as essential in agricultural research and field trials. While more difficult to implement, it is equally essential in studies of human populations,

including economic evaluations of nonformal education. Poor countries which are still unencumbered by any nonexperimental tradition in evaluation research are well advised to take the lead and show that the principle of randomization is not only the ideal of a scientific purist but has fruitful application in an activity as practical as economic evaluation.

In the absence of strict experimental control one runs the risk of rejecting, on erroneous claims of incomparability, those correct results which are opposite to existing beliefs while accepting those results which conform with one's expectations. Economic evaluation work then becomes an expensive and useless exercise in defense of preconceived notions.

International cooperation. Economic evaluation work on nonformal education and other human resource programs is currently dominated by the rich nations. Their methods and results may not be appropriate to poor nations. A rapid exchange of information across national boundaries may help accelerate the testing of current methods and findings and, where desirable, the development of methods and findings more valid for poor countries.

The creation of one or more international institutes for program evaluation may help promote such an exchange of information. These institutes may be assigned additional functions. They may become data processing centers with appropriate computing equipment and statistical advisory staffs. They may arrange seminars and create in-service training opportunities for economic evaluation staffs. They may help coordinate cross-national experimental studies of nonformal education programs.

One may hope that international cooperation in evaluation work will commence and expand, so that the poor nations will not feel compelled to

go through a long process of isolated trial and error but can speedily put to productive use the intellectual capital existing and emerging. The very fact of this conference is an indication that such a hope is justified.

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