

The economics of recurrent education and training

Vladimir Stoikov



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PREFACE

This study was prepared within the framework of the World Employment Programme (WEP), which is the main ILO contribution to the International Development Strategy for the Second United Nations Development Decade. The principal aim of the WEP is to design strategies and policies to improve the employment situation in developing countries and to assist decision makers in the implementation of such strategies and policies. Several types of action are currently under way as part of the WEP, including action-oriented research in the fields of technology and employment; income distribution and employment; population and employment; education and training and employment; rural employment promotion; urbanisation and employment; trade expansion and employment; and emergency employment schemes.

In this study the author¹ tries to evaluate, from the points of view of equity and efficiency, a structure of education that is proposed as an alternative to existing, mostly sequential systems of education. As one writer put it: "Education is a subject much given to vogues, and in vogue at the moment is 'recurrent education'."² Here, however, the author attempts to move away from the "in vogue" character of the subject matter, by rationally analysing the effects of postponement of certain stages of education and of educating somewhat older rather than younger individuals—features that may be assumed to approximate to some of the essential characteristics of recurrent education. Recurrent education as an institutionalised system has not yet been applied in practice and, for that reason, what is evaluated here are

¹ Vladimir Stoikov, Professor of Industrial and Labor Relations at the New York State School of Industrial and Labor Relations, Cornell University.

² Mark Blaug: *Education and the employment problem in developing countries* (Geneva, ILO, 1973), p. 72.

forms of education that have certain characteristics in common with what a recurrent education system would be.

The study forms part of the WEP major research project on education and training and employment. In that sense, it must be seen as a first step in the evaluation of recurrent education from an employment point of view. It assesses the extent to which recurrent education influences economic efficiency and may be seen as evaluating different education schemes on the basis of an employment objective, in so far as an increase in economic efficiency is positively related to an increase in employment.

Recurrent education is a subject that will certainly continue to receive much attention in the near future. The present monograph may open the discussion from an angle that has so far been neglected.

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RECURRENT EDUCATION INTRODUCED

1

The general dissatisfaction with conditions prevailing in the field of education, due in particular to the frequent inability of existing educational systems to cope with changing quantitative and qualitative demands, is probably responsible for the rapidly growing literature on recurrent education. In the near past, recurrent education has increasingly gained the reputation of being the solution to most problems in the field of education and training. Therefore, with rare exceptions, recent writers are for recurrent education, indiscriminately favouring any type of programme. However, the point can be made that this new literature, not unexpectedly, lacks systematic and analytic approaches to the topic. This results often in extreme points of view being adopted on the desirability of the diverse recurrent education programmes and systems proposed by numerous authors.

It is time to approach the topic dispassionately, systematically, and from an analytic point of view. The present study is an attempt to do this.¹ It is mainly concerned with the *economics* of the topic because of the scarcity of such an approach in the literature. Nevertheless, some sections deal with the sociological and psychological aspects of recurrent education, in order to make the discussion reasonably complete.

A major difficulty with an analysis of recurrent education is the elastic quality of the concept. Any expression of a negative opinion is likely to provoke the defence that the critic has not really understood what is being proposed. And in fact more than one concept is involved. More accurately, there are a number of programmes that proponents of recurrent education

¹ The author is indebted to Alan Dillingham, Robert McLean and Richard Shortlidge, who contributed excellent research assistance, as well as to Gabriele Reuschenbach and Peggy Benz for their help respectively in reorganising an early draft and typing the manuscript.

have in mind and, when a particular programme is criticised, the natural tendency is to switch the argument to a different one.

A listing of some of the "definitions" of recurrent education will illustrate this contention :

Recurrent education is *formal*, and *preferably full-time*, education for adults who want to resume their education, interrupted earlier for a variety of reasons.¹

Recurrent education aims to spread the period of formal education over a person's entire lifetime. The notion is that instead of administering education in one concentrated dose between the ages of, say, 6 and 21, everyone would still be entitled to 15 or 16 years of schooling but they would be free to postpone the last two or three years of these to a later age.²

The term "lifelong education" [often used as a synonym for recurrent education] covers a very wide field. In some cases it is applied to strictly vocational education, that is, training and refresher courses in particular technical skills. It may also cover much the same ground as adult education, taken in a much broader sense than training for a specific job though excluding the development of all facets of an individual's personality. But more and more frequently it is being applied to new activities and fields of research which are not included in the traditional notion of adult education, much less vocational training, and which express a desire for evolving a new style of education.³

The essence of the recurrent education proposition . . . is the distribution of education over the lifespan of the individual in a *recurring way* . . . It also implies the alternation of education with other activities, of which the principal would be work, but which might also include leisure and retirement.⁴

. . . education conceived and planned as something which will be experienced by people in an individually on-going, though discontinuous way, over the whole of their lives—and which will correspond with their emerging vocational, social and personal aspirations.⁵

This list suffices. The definitions, although not necessarily inconsistent with each other, differ considerably in emphasis and final objectives. The first one emphasises giving individuals who have missed an education a

¹ OECD, Centre for Educational Research and Innovation: *Equal educational opportunity 1: A statement of the problem with special reference to recurrent education* (Paris, 1971), p. 33.

² Ken Gannicott: "Recurrent education: A preliminary cost-benefit analysis" (Paris, OECD, 1971; mimeographed), p. 3.

³ UNESCO: "Lifelong education in a changing world", in United Nations: *Investment in human resources and manpower planning* (New York, 1971), p. 75. For further developments, still of a general nature, concerning the notion of lifelong and recurrent education, the reader may consult the UNESCO publication *Learning to be: The world of education today and tomorrow* (Paris, 1972; London, Harrap, 1972), sometimes referred to as the Faure report because it contains the findings of the International Commission on the Development of Education established by UNESCO under the chairmanship of Edgar Faure, former Prime Minister and Minister of Education of France.

⁴ Denis Kallen, Jarl Bengtsson and Åke Dalin: *Recurrent education: A strategy for lifelong learning* (Paris, OECD, Centre for Educational Research and Innovation, 1973), p. 7.

⁵ J. A. Simpson: "Permanent education and community development", in Council of Europe: *Permanent education* (Strasbourg, 1970), p. 343.

second chance. The second, fourth and fifth emphasise a redistribution of education and training over the entire life of an individual, and therefore imply a postponement of an educational activity to a later stage of life. The third emphasises a new style in education whose objective remains vague. Most of these definitions are consistent with a number of alternative models of recurrent education. Some of the alternatives, formulated with particular reference to the Swedish system, have been described as follows ¹ :

- I Higher education continues directly from intermediate school. A period of higher education is followed by work in an occupation, after which higher education is completed. After some years in an occupation a brief educational period follows, perhaps a refresher or upgrading course with some specialisation.
- II From intermediate school to an occupation, after which higher education is completed in one sequence. Refresher or upgrading course after some period in an occupation.
- III Periods of occupational work both after intermediate school and between periods of higher education. Refresher or upgrading course after some period in an occupation.
- IV Part-time higher educational studies concurrently with an occupation. These commence after a period of occupational work following intermediate school. Refresher or upgrading course after a period in an occupation.
- V Part-time higher education starts concurrently with occupational work immediately after intermediate school. Final period of higher education is full-time. A later refresher or upgrading course may be taken on a part-time basis.

Diagram 1 may help to visualise these alternatives. As Mark Blaug ² has suggested, "the extraordinary elasticity of the concept of recurrent education (even these five models do not exhaust all the possibilities) make analysis virtually impossible, and perhaps this is the reason that so much of the literature about it is at best inspirational and at worst vague".

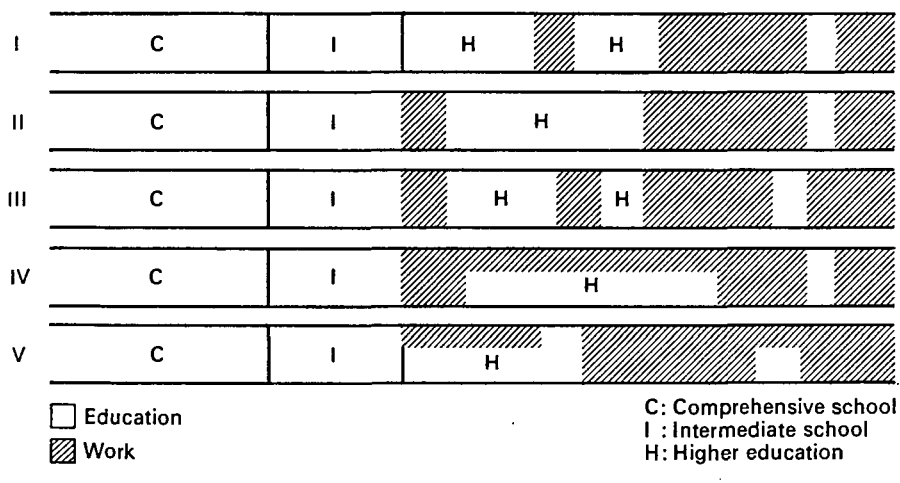
Essentially, the above definitions can be grouped in two main categories : (1) those which propose an institutionalised postponement of the different steps of existing traditional education systems, that is, primary, secondary and higher education (including university) ; and (2) those which propose the creation of a network of different types of education and training programmes and courses (mainly for adults), designed to satisfy education and training needs which could not be satisfied by the existing traditional education systems.

¹ Ulf Larsson : "Recurrent education", in Council of Europe : *Permanent education*, op. cit., p. 415.

² Blaug : *Education and the employment problem in developing countries*, op. cit., p. 73.

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Diagram 1. Some possible alternatives for recurrent education in Sweden



In considering these two main categories one question arises : What is so new about recurrent education ? A number of education and training programmes that can be considered "recurrent" have been around for a long time. Thus, returning to school as an adult, full- or part-time, is nothing new. Here are a few other examples : (a) retraining and further training of older workers ; (b) technical education for career development ; (c) reschooling the unemployed professional ; (d) helping the transition of returning ex-servicemen ; (e) education for undertaking "second careers" ; (f) management training.

The list can be extended almost indefinitely. Government support of such activities is also a long-standing practice. All these programmes have been offered in many countries by different means : in the school, in special centres, at the university, through mass media, at the place of work, and by correspondence. The initiative in starting such programmes has come from many sources, including the public authorities, firms, and associations of different sorts, depending on the need that they were meant to meet.

All this is well known. What is perhaps new in the recent movement for recurrent education is the following. Until recently all the programmes that could pass under the rubric of recurrent education were ad hoc measures undertaken to deal with needs or problems as they arose. In general these measures have remained marginal, often outside the regular educational system, and uncoordinated. The tendency now is to integrate these programmes with the general education system with a view to obtaining a co-ordinated, flexible and comprehensive system, which would consist of an initial education and training phase and subsequent recurrent education and training

phases. The objectives of such an education system are, in addition to the traditional goals of giving an initial general basic education to the population and preparing it for a life of work: (a) offering a second or third chance of an education to those who have not for one reason or another had the opportunity earlier, or who were wrongly oriented in their earlier stages of education; (b) allowing those who were educated or trained in the past, and whose skills may have deteriorated or become obsolete because of changing techniques or changing demand for products, to retool or refurbish their skills; and (c) giving those who want to proceed in their occupation an opportunity of further education. Furthermore, the motivation for such a system may have been reinforced by the *belief* that a substantial further increase in the amount of time and other resources allocated to education over the lifetime of an individual is becoming necessary for social and political reasons.

As is apparent from the discussion, recurrent education has to be understood as a global system of education composed of a number of different programmes combined in a variety of ways.¹ It should be clear that even the limited number of models listed earlier are extremely difficult to analyse. It should also be noted that the alternatives described deal only with higher education arranged in a recurring way. The alternatives multiply when one considers also the other levels of education in the same recurrent way. However, it is possible to analyse the separate programmes of which global recurrent education systems are built up. Such a procedure is justified as long as programmes are not highly inter-related. Evidence on this point being scarce, the study proceeds on the assumption that analysis of the separate parts will not do injustice to the alternative systems as a whole.

The working definition of "recurrent education and training" adopted in the present study is: a global system containing a variety of programmes which distribute education and training of different levels (primary, secondary and tertiary), by formal and non-formal means, over the life span of the individual in a recurring way, that is, alternated with work or other activities. This means that a central feature of recurrent education and training is the timing of different activities, or part of activities, such as formal education, training, work experience, throughout the life of an individual (as opposed to traditional schooling, which is generally timed early in life and in the past was meant to be final).

It is evident from the above definition that it includes any education and training effort which sets in after an initial education followed by a period of employment or other occupation. So adult education at various levels and

¹ The component programmes considered in the present text include formal and non-formal education and training.

retraining, for instance, are regarded in this study as an integral part of any recurrent education system, since they take place (by formal or non-formal means) long after a first education period or after one or a series of employments or other activities.

It should also be made clear that the above definition of recurrent education as a global system containing a variety of programmes represents an ideal situation. At present, it can safely be stated that no such global system yet exists in a comprehensive and institutionalised state : what exist are approximations, or programmes which could fit into a global system of recurrent education. Later in the study, such programmes are analysed with a view to drawing conclusions applicable to the wider framework of global systems. Although, for convenience, we shall continue to refer to these programmes as recurrent education programmes, the distinction between the global system as such and its component programmes should be kept in mind.

CRITERIA AND METHODS FOR EVALUATING RECURRENT EDUCATION

2

Before proceeding further, it is necessary to consider the criteria and methods to be applied in evaluating recurrent education and training.

In this study the evaluation of recurrent education programmes will be undertaken with two criteria in mind : efficiency and equity.¹ The efficiency criterion is important since resources used in a programme (such as instructional staff and student time) have alternative uses, i.e. to produce goods and services valued by a population or, from a narrower perspective, to provide alternative educational programmes. The equity criterion is important because by its very nature recurrent education involves a change in the distribution of activities over time and among members of a population, and such a redistribution has implications for the future social structure, thus raising important questions of social values, such as equality of educational opportunity or equality of income distribution.

Recurrent education programmes are often defended solely on equal-educational-opportunity grounds or equal-distribution-of-income grounds. This is not good enough because it disregards economic efficiency. In judging the wisdom, for example, of supplying higher education to an older worker who has had no chance to obtain such an education earlier, much will depend on whether the present value of such an investment amounts to 90 per cent or only 10 per cent of the present value of the total cost of the education. It is important therefore not to apply one criterion alone.

Ideally, recurrent education programmes should be evaluated on efficiency and equity grounds simultaneously, before they are undertaken. In

¹ Often programmes are evaluated by educational criteria, such as liberation of the inventive spirit of students, impact on IQ, convenience of teachers, or relevance to the life of the community. Such partial criteria may or may not have an independent existence and importance, but are not by themselves sufficient arguments for taking costly decisions. Ideally their impact is included in a general cost-benefit analysis.

reality, decisions on educational programmes are taken in some instances on equity grounds alone, irrespectively of the efficiency argument. This may have been justified on social or political grounds ; nonetheless, it is important to know the cost of such a decision in terms of efficiency. Of course, in the reverse case, if a decision were taken on efficiency grounds only, it would still be important to know the price to be paid in terms of equity.

COST-BENEFIT ANALYSIS

Cost-benefit analysis, as usually practised, is the empirical counterpart to the efficiency ideas of economists. It can be defined as a technique for evaluating public investment projects that compete actually or potentially with similar projects in the private sector. As Blaug points out : "In one sense, cost-benefit analysis is an attempt to do explicitly what the price mechanism does implicitly, namely, to choose investment projects in the order of their benefits per unit of cost".¹ The reason for making cost-benefit analyses is that, for reasons to be discussed in a later chapter, the price mechanism does not perform in the field of educational and training investments in the way often described in an introductory textbook on economics, being unable to take account of all costs and benefits resulting from an investment.

The reasoning is as follows. Investment is the allocation of available resources (which have alternative productive uses) to an activity (say recurrent education) whose benefits will accrue over some part of the future. The benefits take the form of production of goods and services in the widest sense, including psychic returns (or consumption benefits). The costs of an investment are the benefits that could have been obtained by using the resources in an alternative activity (e.g. building hospitals). A social investment is said to be justified if the expected benefits are greater than those costs.

A great deal of literature on recurrent education proposing widespread changes and investments neglects to mention any justification of the type just described. Some proponents of recurrent education reject outright cost-benefit analysis as a method of evaluating proposed investments, but do not suggest any viable alternatives. In the present state of the art, cost-benefit analysis in the field of education has not reached anything approaching perfection. A number of conceptual problems remain, and its application empirically is often very difficult because of our limited understanding of some of the processes involved in education and training.

¹ Mark Blaug : *An introduction to the economics of education* (London, Penguin, 1970), p. 120.

COST-BENEFIT ANALYSIS AMPLIFIED

Some further lines of analysis have been suggested and applied to recurrent education. As will be shown, they are basically efficiency arguments in a dynamic framework and, if valid, should be incorporated in a more general cost-benefit analysis.

The first of these is based on the argument that training programmes will alter the skill composition of the labour force so as to increase employment without increasing inflationary pressure. The benefits from such a programme are, it is claimed, in addition to the usual benefits, a shift of the Phillips curve towards the origin. This shift can in principle be evaluated and added to the benefits enumerated in a cost-benefit analysis. MacRae, Schweitzer, Smith and Holt have presented a preliminary analysis.¹ Their conclusion is that a very substantial expansion of manpower programmes is needed, and that this would be cost-effective in improving the trade-off between inflation and unemployment in the United States. With less than full confidence, they estimate that an increased expenditure of \$14,000 million on manpower programmes would make possible an increase of \$30,000 million in gross national product. The recommended manpower programmes are in four broad areas, only one of which could be considered to fall in that of recurrent education, namely, training and job restructuring to reduce inflationary labour shortages and pockets of high unemployment.

In the present study the additional benefits of recurrent education and training from shifting the Phillips curve to the left are on the whole ignored. Years of research have not resulted in any solid evidence that training programmes have the described effect. Thus Hall, for example, reviewing the work just discussed, is considerably less optimistic about the prospects for shifting the Phillips curve through training programmes.²

A question that is closely related to this line of analysis is the relation between recurrent education and employment. The contribution of recurrent education to employment creation is not easy to untangle. The present study makes no systematic attempt to measure that contribution because, at the present time, our knowledge of the relation is too scanty. Nevertheless, it does indicate, here and there, relationships between certain recurrent education and training programmes and certain employment problems both in developing and in developed countries.

¹ Duncan MacRae, Stuart O. Schweitzer, Ralph E. Smith and Charles Holt : *Manpower programs to reduce inflation and unemployment : Manpower lyrics for macro music*, Paper 350-28 (Washington, DC, The Urban Institute, 1971).

² Robert Hall : "Prospects for shifting the Phillips curve through manpower policy", *Brookings Papers on Economic Activity* (Washington, DC, The Brookings Institution), 1971, No. 3.

Where unemployment is truly structural, it is clear that recurrent education, and particularly certain types of recurrent training programmes, facilitate re-employment. Even though jobs are available in expanding areas or industries, workers may be left without marketable skills because of technological change, the exhaustion of a natural resource, a fall in the demand for a particular product, or the migration of a plant or an industry. In such cases retraining may be efficient (and is certainly equitable), and will lead to the workers' re-absorption into the employed.

But where the demand for labour in general is inadequate, it is difficult to see how recurrent education programmes, or for that matter any educational programme, can do much more than spread the unemployment around. Nevertheless, even simply spreading the unemployment around may have significant benefits. As is well known, prolonged unemployment is demoralising. The concentration of unemployment in particular groups (e.g., the uneducated migrants to the cities) leads to hopelessness and serious social and political problems.

In a more general way, evaluation of recurrent education and training programmes on both efficiency and equity grounds, as recommended in this study, should make a contribution to the solution of the "employment problem". To the extent that programmes are efficient, they do not absorb resources that might have been devoted to the direct creation of employment. To the extent that they are equitable, they contribute to mitigating poverty and thus reducing the "employment problem" defined in terms of income. And in the long run, desirable recurrent education systems may lead to economic growth with its expanding opportunities for employment.

The second line of analysis, employing growth models, tries to define the optimum distribution of education, training, work and leisure over the lifetime of an individual.¹ Using some very simplifying assumptions, these mathematical studies consistently conclude that education and training should be undertaken early in the life of an individual, to be followed by a period of work at the end of which considerable human capital (skills) can have been used up. The simplifying assumptions in these studies are so restrictive that little should be inferred from them about the desirability of recurrent educa-

¹ C. C. von Weizsäcker: "Training policies under conditions of technical progress: A theoretical treatment", in OECD: *Mathematical models in educational planning* (Paris, 1967); Yoram Ben-Porath: "The production of human capital and the life cycle of earnings", *Journal of Political Economy* (Chicago, University of Chicago Press), Vol. 75, No. 4, Part I, Aug. 1967; Yoram Weiss: "Learning by doing and occupational specialization", *Journal of Economic Theory* (New York, Academic Press), No. 3, 1971; and Frank P. Stafford and Paula E. Stephen: "Labor, leisure, and training over the life cycle" (paper presented at the December 1972 meetings of the Econometric Society in Toronto, Canada).

tion in the real world. For that reason, this type of argument has also on the whole been ignored in the present study. If it were included, it would be an additional efficiency argument against recurrent education, for basically it assumes growth benefits from an early completion of the period of education and training.

HIGHER EDUCATION AT A LATER AGE

Before turning, in Chapters 3 and 4, to the many further factors that have to be taken into account in a complete cost-benefit analysis, we devote the remaining part of this chapter to a detailed analysis, in terms of human capital, of investment in higher education at a later age. The discussion begins with many simplifying assumptions, most of which are relaxed as the discussion moves on. The choice of programme for analysis was made on grounds of convenience, rather than because of its importance in a system of recurrent education and training.¹

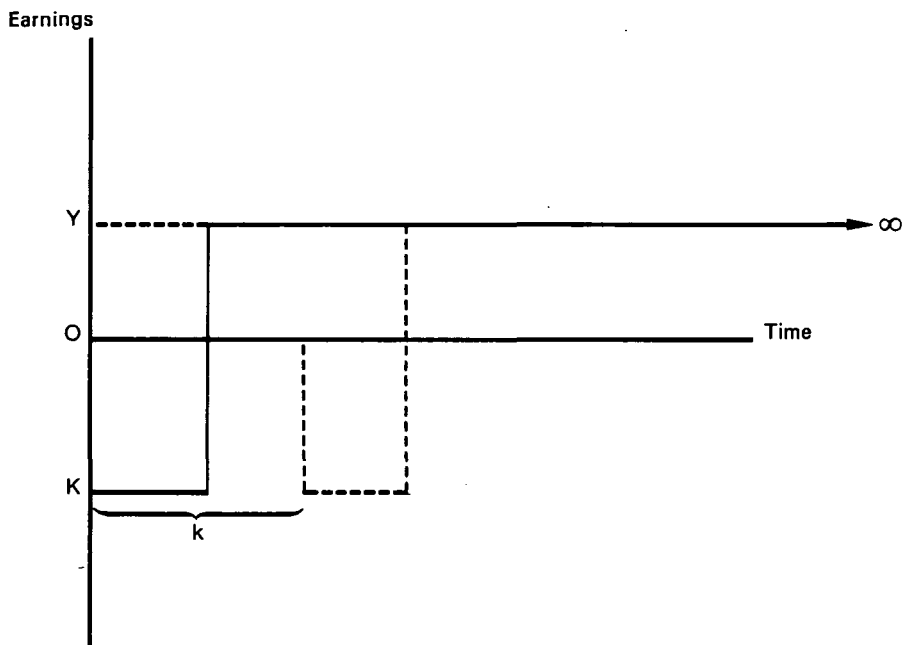
There are at least two very distinct options in supplying higher education to older individuals, which do not necessarily exclude each other. The first one implies a permanent change in the educational system, the second one a temporary change. The first would consist of encouraging (through monetary incentives, quotas or more autocratic methods) young individuals having finished secondary school and capable of entering higher education to postpone this for a number of years. The objective of this could be either to delay the expenditure of scarce resources (especially in poorer countries) or—as defended mainly by educationalists—to provide youngsters, through some years of work experience, with a better chance of improved career choice before entering higher education. This will be called “postponement”. The second option would consist of encouraging (mainly through monetary incentives) older individuals to enter higher education. The prime objective of this policy and the resulting programme is to offer the opportunity of higher education to those older individuals who, for one reason or another, missed obtaining a higher education earlier. This will be called “investing in older individuals”. It is clear that these two options imply different decisions and have to be evaluated separately.²

¹ The programme analysed is also the topic of the paper by Ken Gannicott: “Recurrent education: A preliminary cost-benefit analysis”, *op. cit.* This analysed the postponement of higher education by no less than 17 years.

² Gannicott, *op. cit.*, does compute two sets of rates of return which appear to correspond to the above distinction. However, the presentation is not clear on this point, and since the calculations differ only by postponed costs (p. 11), at least one or the other calculation does not correspond to this distinction.

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Diagram 2. Shifted earnings differential



The analysis begins with the simplest (but not realistic) case in order to bring out clearly the logic of the two decisions. It assumes a constant earnings differential between higher-education graduates and high-school graduates, and total costs of a certain size. For simplicity it is assumed that (a) after his education, the older person will receive the same earnings as the earlier educated individual will receive at this greater age ; and (b) (most unrealistically) that individuals will never retire. Diagram 2 illustrates the conditions described. One period is relevant to the present discussion : k , the length of time for which an investment (costing K and yielding Y for ever) is postponed or the difference in age between the age of an older worker ready to undertake an investment and the earliest age at which he could have undertaken it ; k stands for two somewhat different things because two different decisions are involved in evaluating this type of recurrent education : (1) What is the loss in human capital in postponing an investment for k years ? (2) Once the investment has been postponed for k years, what is the gain or loss in human capital through investment for an older individual rather than a younger one ?

The effect of "postponement" is defined as the difference between the present value of the investment at time zero and the present value of the investment on an education postponed for k years. Let i be the discount rate. Then the present value of the investment (PV) is given by :

$$PV = \frac{Y}{i} - K. \quad (1)$$

The present value of the postponed investment is :

$$\frac{\frac{Y}{i} - K}{(1 + i)^k}. \quad (2)$$

The difference expressed in terms of PV is:

$$\text{Difference} = \text{Loss} = PV \left(1 - \frac{1}{(1 + i)^k} \right). \quad (3)$$

As long as PV is positive, the difference (loss) is always positive, indicating a capital loss from the postponement which increases with the length of postponement and the size of the discount rate (assumed always positive).

The loss or gain in "investing in older individuals" is defined as the difference between PV (equation 1) and the present value of a similar investment of an individual k years older. On the simplifying assumption that returns are collected forever, PV is exactly the same as given by equation 1, so that the loss on this investment is equal to zero. In the more realistic situation of a limited working life, investing in older individuals leads to a shortening of the period over which returns are collected and therefore to a certain loss in this programme.

The point of the present exercise is to demonstrate that, even when the period over which returns are collected is not shortened, there is a sizable loss in human capital in "postponement". Table 1 calculates for purely illustrative purposes the loss involved as a function of the number of years of postponement (k), assuming typical values of a four-year college education. It is clear that the longer the period of postponement, the larger is the proportion of present value of an investment lost. Even as small a postponement as 10 years leads to a capital loss of over 50 per cent of the present value (this percentage is an increasing function of the discount rate).

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Table 1. Losses of postponement as a function of k and i

k (years)	$i = 0.10$ $PV = 10,000$	$i = 0.08$ $PV = 20,000$
5	3 791	6 388
10	6 145	10 736
15	7 606	13 694
20	8 514	15 710

$Y = 4,000$

$K = 7,500/\text{year}$ or 30,000 for four years

The conclusion to be drawn is that an institutionalised postponement of a paying investment is always more expensive than an investment in an older individual (rather than in a younger one) since the older individual has already incurred the capital loss of a postponement.

We turn now to a somewhat more realistic and complex cost-benefit analysis of the same two decisions. The analysis begins by assuming different earnings differentials between higher-education graduates and high-school graduates (in one case a constant differential, in a second case an increasing differential). Costs of a certain size are also assumed (in one case constant, in the other increasing with the age of the individual undergoing the education). For simplicity it is assumed again that, after his education, the older person will receive the same earnings as the earlier educated individual will receive at this greater age.¹

With these assumptions, one can proceed to evaluate the loss (if any) in present value (or loss in human capital) of (a) an option of "postponement" and (b) an option of "investing in older individuals". The appendix to this chapter presents this evaluation in some detail. The losses in human capital for an individual are expressed in terms of the present value of the investment of a young individual (PV), the income differential (Y), the number of years of postponement (k) (which also stands for the difference in age between the older and younger student), the discount rate (i), the rate of increase of the

¹ Gannicott, op. cit., pp. 8-9, argues that such an assumption is over-optimistic, but does not consider two important effects: (a) the complementarity of work experience and learning, and (b) the improved education obtained at a later date. There are other possible effects, but it is clear that arguments are not sufficient to resolve this issue since it is an empirical one. The present study makes the simplest assumption for lack of evidence on this point.

Table 2. Losses due to selected education options

k	Differentials	Postponement option	Investing in older individuals option
5	Constant	6 159	794
	Increasing	6 927	99
10	Constant	10 350	1 961
	Increasing	11 866	765
20	Constant	15 144	6 193
	Increasing	17 898	5 125

 $Y = 4,000$ $r = 0.01$ $p = 40; n = 4$ $K = 5,275$ (yearly total cost) $i = 0.08$ Implied PV constant differentials ($r = 0$) = 17,589Implied PV increasing differentials ($r = 0.01$) = 21,330

Source : Calculated from expressions in the appendix to this chapter.

differential (r) (which could also include a rate of obsolescence), and the length of the investment period (n).¹

The illustrative results could have included a very special case, where the present value of the investment of a young individual is equal to zero. The case describes long-run equilibrium in which there are no further incentives for anyone to enter the profession or occupation under consideration. Although the case has some theoretical interest, it does not describe realistically the situation in a dynamic economy subject to technological change in which skills and knowledge are subject to a great deal of obsolescence, and there are consequently constantly shifting and increasing demands for different and new skills and accomplishments. These changes will constantly create opportunities resulting in positive values of PV . For that reason Table 2 considers only the general case of $PV > 0$.

Table 2 presents the human capital losses due to the two options under the assumption of "realistic" values of the variables briefly defined earlier.² The upper portion considers a postponement (or alternatively an age differential in the case of "investment in older individuals") of 5 years, the middle

¹ A reading of the appendix to this chapter is necessary for complete understanding of the evaluation.

² By "realistic" values we mean values which correspond in order of magnitude to a four-year college education in the United States. For the purpose at hand, nothing more precise is necessary. Our main conclusions are not sensitive to variations in these "realistic" values.

portion one of 10 years, and the lower portion one of 20 years. The conclusions to be drawn from this table can be summarised briefly as follows : (1) the human capital losses in an option of "postponement" of even as little as 10 years are a very substantial portion of the capital value of the investment ; (2) the human capital losses in an "investment in older individuals" are small compared to either the capital value of the investment or the losses involved in a system of postponed higher education.¹

Note that these losses can be interpreted as the cost of undertaking the programme in question rather than the alternative. In the case of "investing in older individuals", these are the costs of investing in an older individual rather than in a young one. These costs are small, mainly because the capital loss has already been sustained by the older individual and does not come into the decision whether or not it is worth educating him now. Thus, these costs are a reasonable measure of the cost to society of redistributing educational expenditures from the young to the old, *ceteris paribus*. Given that the argument of reasonable income distribution (or just educational distribution) is being applied to this group, there is no cogent reason why the additional investment should not be undertaken, especially since it is more or less a one-shot affair.

On the other hand, given the high cost of a postponed higher education, and the fact that there is no income distribution argument to offset it, there appear to be no valid reasons for considering a recurrent education system which includes an option of postponement for a substantial² number of years.

The results reported here are for an assumed discount rate i of 8 per cent and a growth of differential returns and costs of 1 per cent. The second part of the appendix reports on the sensitivity of these results to variations of i and r . The qualitative conclusions reached above remain unaffected.

¹ The same conclusions were drawn from a somewhat flawed analysis of the problem in Vladimir Stoikov : "Recurrent education : Some neglected economic issues", *International Labour Review* (Geneva, ILO), Vol. 108, Nos. 2-3, Aug.-Sep. 1973, pp. 187-208. In particular the values in the table on p. 192 of that article were computed inconsistently by specifying at the same time both PV and K (yearly total cost). After the inconsistency was corrected in the present study, I received a note from K. Gannicott and J. R. Shannon (both of OECD), pointing the matter out to me.

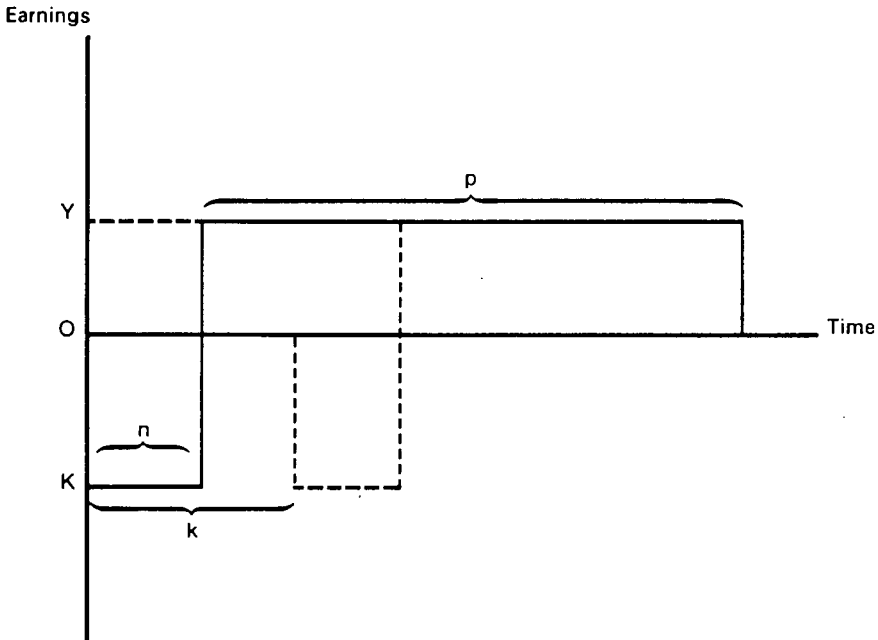
² "Substantial" meaning anything over five years. It will be argued later than certain postponements of less than five years may very well be highly desirable.

APPENDIX : HUMAN CAPITAL LOSSES DUE TO SELECTED RECURRENT EDUCATION OPTIONS

Constant differential and constant costs

Let Y_t be the yearly net earnings obtained from an activity, in this case an investment in human capital. An example of such an activity is a four-year college education. The earnings are net of the earnings in the best alternative activity not involving such an investment. In the present case these net earnings are assumed constant over the working life of the individual. Let K_t be the total costs of this investment. Total costs include the direct cost of the education plus the income forgone throughout the period of the investment. These costs are also assumed constant and independent of the age at which the investment is undertaken. Diagram 3 illustrates the conditions described. Three periods of time are relevant to the present discussion: (1) n , the length of the investment period; (2) p , the length of the period over which net returns are received as a result of the investment, and (3) k , the length of time by which an investment is postponed or the difference between the age of an older worker ready to undertake an investment and the earliest age at which he could have undertaken it; k stands for two somewhat different things because two questions requiring different answers are involved in evaluating recurrent education: (1) What is the value or loss in human capital in postponing an investment for k years? (2) Once the investment has been postponed for k years (having involved a capital gain or loss), what is the gain or loss in human capital in investing in an older individual compared to investing in a young individual?

Diagram 3. Constant differential and constant costs



Postponed investment

The loss through postponement is defined as the difference between the present value of the investment at time zero and the present value of the investment in an education postponed for k years. Let i be the discount rate. Then the present value of the immediate investment (PV) is given by:

$$PV = \frac{Y}{i(1+i)^n} \left(1 - \frac{1}{(1+i)^p}\right) - \frac{K}{i} \left(1 - \frac{1}{(1+i)^n}\right). \quad (1)$$

The present value of the postponed investment is:

$$\frac{Y}{i(1+i)^{k+n}} \left(1 - \frac{1}{(1+i)^{p-k}}\right) - \frac{K}{i(1+i)^k} \left(1 - \frac{1}{(1+i)^n}\right). \quad (2)$$

The difference [(1) - (2)], expressed in terms of PV , can be shown to be equal to:

$$\text{Difference} = PV - \frac{PV}{(1+i)^k} + \frac{Y}{i(1+i)^{p+n}} \left(1 - \frac{1}{(1+i)^k}\right). \quad (3)$$

This difference is always positive (for $PV > 0$), indicating a capital loss from the postponement. One can note the following conclusions. As the years of postponement (k) increase, the capital loss increases. As p increases the loss approaches the figure given by $PV \left(1 - \frac{1}{(1+i)^k}\right)$. Finally, there is a special case worth considering, i.e. one of long-run equilibrium where $PV = 0$, and there is indifference between investment or non-investment before postponement. For reasons discussed in the text this case, although theoretically interesting, is rather unrealistic in a dynamic society subject to technological change. In that very special case the loss is reduced to:

$$\text{Difference(competitive)} = \frac{Y}{i(1+i)^{p+n}} \left(1 - \frac{1}{(1+i)^k}\right). \quad (4)$$

Note that in this special case an increase in the discount rate generally reduces the loss (for $p + n$ considerably larger than k). In the more general case described by equation 3, as long as PV is of a reasonable size compared to Y , an increase in the discount rate will increase the loss.

Investing in older individuals

The loss (or gain) is defined as the difference between PV (as given by equation 1 in the previous section) and the present value of a similar investment of an individual k years older. This latter value is given by:

$$\frac{Y}{i(1+i)^n} \left(1 - \frac{1}{(1+i)^{p-k}}\right) - \frac{K}{i} \left(1 - \frac{1}{(1+i)^n}\right). \quad (5)^1$$

The difference can be shown to be equal to:

$$\frac{Y}{i(1+i)^{p+n}} \left((1+i)^k - 1\right). \quad (6)$$

¹ Throughout this appendix, it is implicitly assumed that the older person will, after the investment, be as productive as a younger investor reaching the same age. In the constant-earnings-differential case discussed here the assumption is reasonable. In the case to be discussed shortly the assumption may appear over-optimistic.

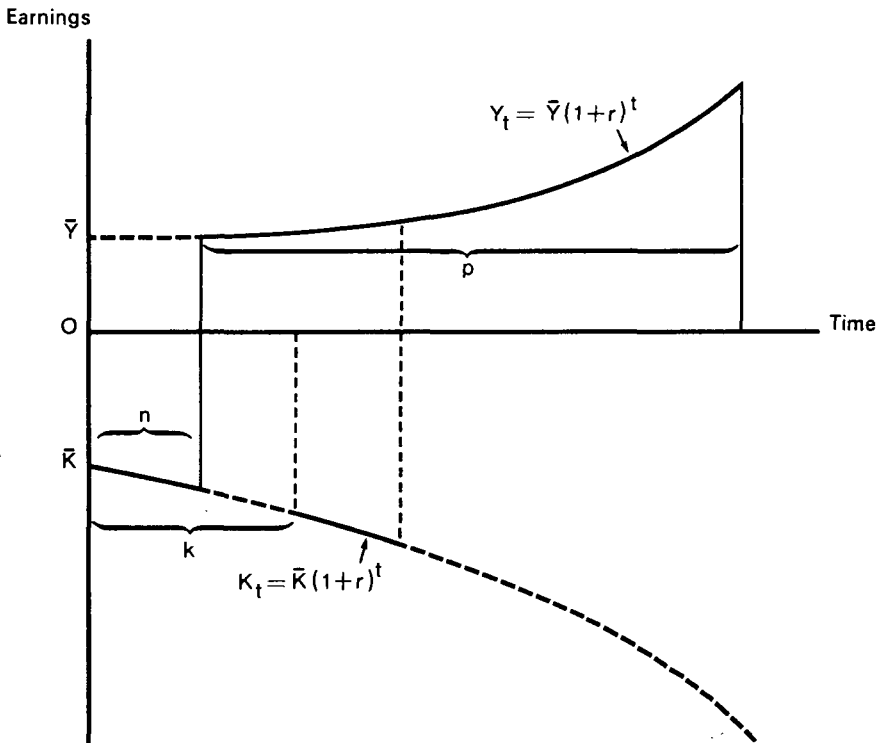
This difference is always positive, indicating a capital loss in educating an older worker compared with educating a young one. The loss is directly related to the age differential and inversely related to the length of working life and the length of the period of education.

In the general case in which PV is positive and of a reasonable size in relation to Y , the loss from postponement is greater than the loss from educating older individuals instead of young ones. This should be intuitively clear since, in the case of deciding to educate an older person, a human capital loss has already taken place and does not influence the decision of whether or not it is worth educating him now.

Equation (6) is a reasonable measure of the cost to society of redistributing educational expenditures from the young to the old, *ceteris paribus*. This is discussed in more detail in the text.

In this case the net earnings are assumed to increase at a constant rate over the working life of the individual. If both the gross earnings and their opportunity cost increase at a given rate, the differential will increase at the same rate. The case is convenient for analysis, and is probably more realistic than the constant-differential case. Since the opportunity costs increase with postponement (and age), it is assumed for convenience that direct costs increase at the same rate so that total costs also rise by r per cent per year. Diagram 4 illustrates the conditions described.

Diagram 4. Increasing differential and increasing costs



Postponed investment

The loss from postponement is defined as in the previous case. The present value of the immediate investment (PV) is given by¹:

$$PV = \frac{\bar{Y}}{(1+i)^n(i-r)} \left(1 - \frac{1}{(1+i-r)^p}\right) - \frac{\bar{K}}{(i-r)} \left(1 - \frac{1}{(1+i-r)^n}\right). \quad (7)$$

The present value of the postponed investment is:

$$\frac{\bar{Y}(1+r)^k}{(1+i)^{k+n}(i-r)} \left(1 - \frac{1}{(1+i-r)^{p-k}}\right) - \frac{\bar{K}(1+r)^k}{(1+i)^k(i-r)} \left(1 - \frac{1}{(1+i-r)^n}\right). \quad (8)$$

The difference [(7) - (8)], expressed in terms of PV , can be shown to be equal to:

$$\text{Difference} = PV - \frac{PV}{(1+i-r)^k} + \frac{\bar{Y}}{(1+i-r)^p(1+i)^n(i-r)} \left(1 - \frac{1}{(1+i-r)^k}\right). \quad (9)$$

The difference is always positive (for $PV > 0$), indicating a capital loss in the postponement. The expression is very similar to that obtained in the constant-differential case, and similar conclusions follow.

Investing in older individuals

Here again the loss is defined as in the previous case. The present value of an investment in an individual k years older than the youngest investor is given by:

$$\frac{\bar{Y}(1+r)^k}{(1+i)^n(i-r)} \left(1 - \frac{1}{(1+i-r)^{p-k}}\right) - \frac{\bar{K}(1+r)^k}{(i-r)} \left(1 - \frac{1}{(1+i-r)^n}\right). \quad (10)$$

The difference can be shown to be equal to:

$$PV - PV(1+r)^k + \frac{\bar{Y}(1+r)^k}{(1+i-r)^p(1+i)^n(i-r)} \left((1+i-r)^k - 1\right). \quad (11)$$

In the case of $PV > 0$, where PV is of a reasonable size compared with \bar{Y} , the loss either becomes very small, or can become a gain.

Sensitivity analysis

Table A reports the calculations of losses involved in the two alternative options for discount rates varying from 4 to 12 per cent and for rates of growth of differential returns and costs from 0 to 3 per cent. Nothing in this table changes the main conclusion reached in the text: if anything, the contrast becomes even stronger at higher rates of growth of differential returns and at higher rates of discount. Table C reports the PV values implied by the different i and r values assumed in table A.

The same calculations were performed for $K = 7,500$ in order to see whether the qualitative conclusions could be influenced by the size of total costs of the investment. These calculations are reported in table B. Nothing new results. Table D reports the PV values implied in these calculations. It is clear that with a discount rate of 12 per cent (and $r = 0.00$ and $r = 0.01$) the contemplated investment without postponement is not worth undertaking. Under these special conditions there is a gain attached to postponing the investment decision, as should be intuitively clear. The gain increases with the length of postponement, which simply means that the investment should never be undertaken.

¹ $\frac{(1+r)^t}{(1+i)^t}$ where i and r are small compared to 1, and $i > r$, can be approximated closely by $\frac{1}{(1+i-r)^t}$.

Table A. Sensitivity of losses from alternative investments to different i and r values for $K = 5,275$

		$k = 5$		$k = 10$		$k = 20$	
		Postponement	Investing in older individuals	Postponement	Investing in older individuals	Postponement	Investing in older individuals
$r = .00$	$i = .04$	11 812	3 857	21 521	8 551	36 060	21 208
	$.06$	8 727	1 736	15 248	4 060	23 762	11 331
	$.08$	6 159	794	10 350	1 961	15 144	6 193
	$.10$	4 018	369	6 514	962	9 025	3 457
$r = .01$	$.12$	2 233	174	3 501	479	4 628	1 968
	$i = .04$	12 965	2 818	24 149	7 056	42 118	21 282
	$.06$	9 668	795	17 244	2 522	27 830	10 306
	$.08$	6 927	99	11 866	765	17 898	5 125
$r = .02$	$.10$	4 644	-80	7 663	172	10 900	2 722
	$.12$	2 742	-70	4 369	54	5 908	1 657
	$i = .04$	14 223	1 253	27 104	4 585	49 340	20 217
	$.06$	10 695	-587	19 486	119	32 650	8 032
$r = .03$	$.08$	7 765	-923	13 568	-1 092	21 144	3 010
	$.10$	5 328	-758	8 954	-1 088	13 101	1 210
	$.12$	3 298	-468	5 346	-691	7 407	825
	$i = .04$	15 595	-1 023	30 433	758	57 984	17 420
$r = .04$	$.06$	11 816	-2 564	22 009	-3 479	38 386	3 907
	$.08$	8 680	-2 381	15 481	-3 858	24 986	-649
	$.10$	6 074	-1 739	10 404	-2 994	15 694	-1 449
	$.12$	3 905	-1 072	6 444	-1 875	9 166	-790

 $Y = 4,000$ $p = 40; n = 4$ Implied PV values are recorded in table C.

Table B. Sensitivity of losses from alternative investments to different i and r values
for $K = 7,500$

		$k = 5$			$k = 10$			$k = 20$		
		Postponement	Investing in older individuals	Postponement	Investing in older individuals	Postponement	Investing in older individuals	Postponement	Investing in older individuals	Investing in older individuals
$r = .00$	$i = .04$	10 374	3 857	18 900	8 551	31 669	21 208			
	$.06$	6 778	1 736	11 843	4 060	18 456	11 331			
	$.08$	3 805	794	6 394	1 961	9 356	6 193			
	$.10$	1 345	369	2 180	962	3 020	3 457			
	$.12$	-690	174	-1 082	479	-1 431	1 968			
$r = .01$	$i = .04$	11 829	3 239	22 033	7 922	38 427	23 103			
	$.06$	7 960	1 197	14 198	3 348	22 914	12 043			
	$.08$	4 764	438	8 161	1 554	12 309	6 784			
	$.10$	2 121	287	3 500	927	4 978	4 309			
	$.12$	-64	282	-102	776	-139	3 177			
$r = .02$	$i = .04$	13 424	2 135	25 583	6 440	46 569	24 334			
	$.06$	9 257	253	16 866	1 887	28 260	11 957			
	$.08$	5 817	-120	10 163	596	15 838	6 756			
	$.10$	2 974	9	4 998	526	7 313	4 791			
	$.12$	625	266	1 012	853	1 403	4 252			
$r = .03$	$i = .04$	15 174	360	29 611	3 743	56 418	24 418			
	$.06$	10 680	-1 246	19 892	-635	34 694	10 574			
	$.08$	6 972	-1 124	12 435	-1 145	20 069	5 711			
	$.10$	3 911	-539	6 699	-4 021	10 105	4 626			
	$.12$	1 382	76	2 280	604	3 244	5 021			

$Y = 4,000$
 $p = .40 ; n = 4$
Implied PV values are recorded in table D.

Table C. Values of *PV* for different *r* and *i* values

<i>i</i>	<i>r</i> = .00	<i>r</i> = .01	<i>r</i> = .02	<i>r</i> = .03
.04	48 529	59 427	73 448	91 681
.06	29 394	35 662	43 563	53 628
.08	17 589	21 330	25 960	31 746
.10	9 997	12 301	15 108	18 556
.12	4 935	6 389	8 139	10 257

 $Y = 4,000$ $p = 40 ; n = 4$ $K = 5,275$ Table D. Values of *PV* for different *r* and *i* values

<i>i</i>	<i>r</i> = .00	<i>r</i> = .01	<i>r</i> = .02	<i>r</i> = .03
.04	40 451	51 157	64 976	83 000
.06	21 684	27 772	35 487	45 358
.08	10 220	13 794	18 250	23 856
.10	2 944	5 093	7 739	11 020
.12	-1 824	-514	1 086	3 049

 $Y = 4,000$ $p = 40 ; n = 4$ $K = 7,500$

RECURRENT EDUCATION, EQUITY, INCOME DISTRIBUTION AND EMPLOYMENT

3

By its very nature recurrent education involves a change in the distribution of activities over time and among members of a population. Programmes will therefore involve not only a change in the distribution of income over time for a single individual, but also a change in the distribution of income among social and economic classes. Such changes will have employment effects, particularly if governments accept an employment increase explicitly as a policy objective.

RELATION BETWEEN EQUITY AND EFFICIENCY

It is convenient and useful to separate questions of efficiency from questions of equity, although this is at present considered by a number of economists as arbitrary.¹ If benefits and costs were interpreted in the wide sense to include all advantages and disadvantages of a programme, including the extent to which equity effects were favourable or unfavourable, then there would be no need for the separation. However, as the practical difficulty in placing a value on these effects so that they can be directly compared with the more conventional benefits and costs is enormous, economists have preferred to deal with efficiency and equity aspects separately on pragmatic grounds. Standards of equity may differ and change over time between regions or nations, and may often be difficult to specify. By separating the issues it becomes more feasible to deal with the separate parts. But this does not mean that one part or another can be overlooked. Thus a conventional cost-benefit analysis that implicitly evaluates only efficiency (be it in a static, or in

¹ Burton A. Weisbrod: "Income redistribution effects and benefit-cost analysis", in Samuel B. Chase, Jr. (ed.): *Problems in public expenditure analysis* (Washington, DC, The Brookings Institution, 1968), p. 178.

a dynamic sense including the inflation-unemployment trade-off) should at the same time spell out the favourable and unfavourable effects of a programme on equity, even if a definite value cannot be placed on these effects.

Some contend that society should allocate its scarce investment resources in the most efficient way, i.e. for those who can most readily acquire the skills which are in greatest demand. If this resulted in great disparities in skills and income, income could then be redistributed through taxation and transfer payments. As Thurow¹ points out, such a solution poses three problems. First, a society's willingness to redistribute income may be limited—for example, by its preferences regarding the type of transfer. In particular, the public may feel that inefficient manpower and training programmes which lead the recipient to work are better than straight transfers.² Second, heavy taxation for transfer payments may considerably reduce the incentive to work of both those who are taxed and the beneficiaries. Finally, some consumption (psychic) benefits are attached to productive work, and can be obtained only by having an interesting job.

Redistribution through taxation and transfer payments is thus a far from costless undertaking.³ It is therefore necessary and desirable in evaluating a programme to balance efficiency against equity directly. It should be noted that sometimes there is no conflict between efficiency and equity, as in the case of recurrent education for village-level extension workers in India (discussed in Chapter 5). But frequently a trade-off between efficiency and equity will exist, and maximising both simultaneously will be impossible. In such a case equity will have to be valued, and the price paid in undertaking a programme will be the extent of departure from efficiency in the usual sense. Such reasoning was used earlier in the discussion of investing in higher education for older individuals in Chapter 2. As Ribich has so aptly put it :

Operationally, it means decision makers should seek to find how much equity, of various sorts, can be purchased with compromises on efficiency *and* what a responsible valuation would be for varying degrees of attainment of each of the equity goals.⁴

¹ Lester Thurow : *Investment in human capital* (Belmont, Calif., Wadsworth, 1970), pp. 126-127.

² This latter point has received some attention in recent literature ; see, for example, R. H. Scott : "Avarice, altruism, and second party preferences", *Quarterly Journal of Economics* (Cambridge, Mass., Harvard University Press), Vol. LXXXVI, No. 1, Feb. 1972, pp. 1-18.

³ Weisbrod, *op. cit.*, p. 183, cites also administrative and political costs.

⁴ Thomas I. Ribich : "Equity and efficiency considerations in recurrent education", paper presented at the OECD Recurrent Education Conference, Washington, DC, 18-21 March 1973 (mimeographed), p. 21.

Some of the more important equity goals can be summarised at this point. The most general classification of goals used by economists are the notions of horizontal and vertical equity. Horizontal equity prescribes that individuals in similar economic and social circumstances should be treated equally by public policy. Two examples of this equity idea are the notions of (a) giving more education to older workers because their educational opportunities were less than those of the present generation ; and (b) giving more education to women because in similar circumstances they were treated unfairly by the educational system. Vertical equity prescribes that public policy should be relatively more generous to those in relatively less well-off situations. The extent of this generosity is defined quite specifically in education where the standard of equal educational opportunity is applied (see below).

In addition to the horizontal and vertical notions of equity, two further standards are often applied in discussions and evaluations of recurrent education programmes. These are (a) the notion of reward, exemplified by public education policies towards returning ex-servicemen ; and (b) the notion of fulfilling legitimate expectations threatened by forces outside the control of the individual, exemplified by public policy towards the loss of occupational job status due to technological change or to changing demand and supply conditions in an economy.

MEASURES OF EQUALITY

Equality of economic status is conventionally measured by equality of yearly income. Though in practice a number of different concepts of income have been used in comparisons of income distribution, they are usually closely related, and all have the feature in common that they are annual amounts. One may feel some doubt whether equality can be properly described solely in terms of the flow of income at a point in time : the flow of income during a person's lifetime may be more relevant. Harry Johnson asserts that most economists would agree that "inequality is to be measured not by the labour incomes of individuals undifferentiated by age and education but by the lifetime earnings (or with greater theoretical accuracy, consumption) profiles of these individuals".¹ It has been demonstrated that the distribution of current earnings is a function of the age composition of the population and the distribution of earnings over the lifetime of the individuals making up the population.² There is no feasible way of constructing earnings

¹ Harry G. Johnson : "The alternatives before us", *Journal of Political Economy*, Vol. 80, No. 3, Part II, May/June 1972, p. S285.

² Vladimir Stoikov : "How misleading are income distributions ?" (1973 ; mimeographed).

distributions standardised for these factors because they interact in a multiplicative manner. The more unequal the distribution of earnings over the lifetime of individuals, the more important becomes the age composition in determining the earnings distribution. And yet the literature, as will be shown in the next section, continues to describe, analyse, and compare earnings and income distributions. The alternative of constructing a distribution of the present value of lifetime earnings and income would involve difficult empirical work, and some possible conceptual pitfalls, but appears at this point considerably more attractive.

The question of a measure of equality of educational opportunity is somewhat simpler if it is possible to agree on a standard of equal opportunity. At least three versions of the standard are in use. These require that individuals of lower economic status be subsidised to a degree sufficient to ensure that (a) individuals have the same range of educational choices ; (b) individuals participate at the same rate in education ; and (c) individuals receive the same benefits in terms of income derived from schooling. To each version corresponds an operational measure that can be defined with relative ease. Clearly the last version, however, involves the same problems as the measure of equality in general.

EFFECT OF SCHOOLING AND RECURRENT EDUCATION ON EQUALITY

In the past it has been an article of faith of educationalists and the rest of the community that the more schooling (conventional or recurrent) there is, the more equal the distribution of income will be. More recently, this article of faith has been challenged by a number of scholars. In the United States two such recent studies stand out. There is first the work of Christopher Jencks and his associates.¹ Applying statistical techniques, they have calculated what part of income variations can be attributed to each of three antecedents—schooling, intelligence and home environment—and have found that the part attributable to each is small. Their estimate of individual income variance explained by schooling is of the order of 12 per cent.

One might legitimately inquire how scholars ever got the impression that schooling is an important means to upward mobility and general welfare. The answer is that Jencks' findings are consistent with the propositions that (a) schooling has been in the past in the United States, and is in the present in other countries, a means to upward mobility ; and (b) schooling benefits

¹ Christopher Jencks : *Inequality : A reassessment of the effect of family and schooling in America* (New York, Basic Books, 1972).

the income of the community as a whole at all times, even when it no longer enables individuals to rise in relation to their fellows. The consistency becomes clear if one looks back at what has happened in most developed countries. In the not-too-distant past few individuals went to school. Those few had high incomes as a result of schooling. As the State came to subsidise education, larger and larger numbers went to high school and college. The result was a rise in average income as education raised the general level of competencies in the population. During this period educated people were in demand, and schooling was a means of social and economic mobility for many. As subsidised education became widespread, those with more education could no longer capture much of the total benefit of that schooling. At the same time the variation in number of years of schooling diminished, so that at the end one would expect a low correlation between income and education; at the same time those who are at the bottom of the income distribution are at the bottom of a rich rather than a poor country.

The other study which comes to conclusions similar to those of Jencks is one by Lester Thurow.¹ This reveals that, while the distribution of education has moved in the direction of greater equality over the post-war period in the United States, the distribution of income has not. The remarks made in relation to Jencks' study apply equally well here. In addition, for the reasons mentioned in the preceding section, the results of both studies can be questioned on the ground that their measures of economic welfare—income flows at a point in time—are biased. The results of a recent study² may clarify this point. Two findings are of relevance to the present argument: (a) as one moves up the educational ladder, the distribution of income (at a point in time) within each educational group becomes significantly *more unequal*; and (b) as one moves up the educational ladder, the distribution of the present value of expected future earnings at the age of 18 within each educational group becomes very significantly *more equal*. From the first finding one can infer within limits that, as the distribution of education becomes more equal (especially as a higher proportion of high-school graduates go on to university), one can expect the distribution of income to become more unequal. This finding is consistent with those of the studies discussed, but points to the weakness of the measure of inequality chosen. The second finding may tempt one to infer that, for all groups as a whole,

¹ Lester C. Thurow and Robert E. B. Lucas: *The American distribution of income: A structural problem*, US Congress, Joint Economic Committee Print, 92nd Congress, Second Session (US Government Printing Office, 17 Mar. 1972). See also Lester C. Thurow: "Education and economic equality", *The Public Interest* (New York, National Affairs Inc.), No. 28, Summer 1972, pp. 66-81.

² Stoikov: "How misleading are income distributions?", *op. cit.*

economic inequality (measured by the suggested alternative measure of life-time income) decreases as more individuals attain a higher educational level. Such an inference would be incorrect because over-all inequality depends not only upon inequality within groups but also on the proportion of each in the total. Only when the proportion of the group in the upper end becomes very large can one safely make the intuitive inference.

It is possible to raise the question whether perceived economic equality is best measured by a measure of equality of the population as a whole. To some extent perceived equality is a function of the relative equality among peers. A relevant peer group is the individual's educational attainment class. If that is accepted, perceived equality will increase partially to the extent that individuals move up from one educational attainment group to a higher one. In that sense there has been some equalisation of economic welfare in the United States over the past 20 years.

We have given so much space to the effect of schooling on economic welfare mainly for two reasons. The information is of some relevance to recurrent education. The more obvious reason is that, apart from the study of village-level workers in India (see Chapter 5), there is almost no empirical information on the direct effect of recurrent education and training on the distribution of economic welfare. A great deal is claimed for recurrent education, but serious empirical research has been scarce. It is earnestly hoped that the present exposition may inspire such work in the future.

EQUALITY AND INCENTIVES

Having found that schooling has little effect on income, Jencks and his associates opt for a public policy designed to redistribute income through taxation and income transfers. We emphasised earlier that such a policy is far from costless. In recommending such a policy, Jencks assumes it to be costless : thus the comparison made is not a fair one. In addition it is not at all clear that redistribution of the type contemplated by him is a feasible solution. These points will be taken up in turn.

The prospect of higher income induces a person to work harder. This is a mechanism governing societies independently of their social and political systems. It may be quite possible that income above a certain level is not sought for the consumer goods it can provide, but for the social status it provides. Whatever the motivation, there is no doubt that the distribution of income affects the amount of production. Redistribution in such a situation can have very serious effects. As redistribution proceeds (through taxation and transfers, not through equalisation of skills and other human competencies), the incentives to produce of both the "penalised individuals" and the

“beneficiaries” could fall so low that even the latter would have lower incomes than they did before redistribution. If more concrete knowledge were available on this relation, it would be possible for an electorate to vote intelligently on redistribution through the means discussed here. Even without that concrete knowledge at the moment, proponents of simple redistribution should obviously be careful not to omit to mention the costs of such a policy.

When the graduated income tax was introduced, the object was to achieve a certain amount of redistribution. The argument for redistribution was that the satisfaction obtained from an additional dollar was higher for a poor man than a rich man, so that total economic welfare could be increased through such a tax. This simple idea was modified as time passed, with consequences well known to all. Loopholes, exceptions, special treatments and (not least) inflation have eroded its redistributive power to such an extent that the incidence has become similar for all income levels. Jencks and his associates do not compare the equalising effects of schooling with those of the income tax, as both have operated in fact. If they had done that, and in addition had taken account of the problem of incentives, they might well have concluded that schooling was the relatively more effective means of redistribution.

RECURRENT EDUCATION AND EQUITY

Given the small amount of empirical work available, any remarks on the relation between recurrent education and equity are bound to be somewhat speculative in nature. Their controversial aspect may induce research in this rather complicated area, so that the topic will become one day less a matter of debate, and more a matter of choosing well-documented alternatives.

We have stressed throughout this and the preceding chapter the importance of evaluating programmes on both efficiency and equity grounds, partly because a logical separation is difficult, and partly because any recurrent education programme has an impact on both, and thus has to be judged by both criteria. The literature on recurrent education is often deficient on this point. It either evaluates a programme on conventional cost-benefit criteria (efficiency) and makes a recommendation on those grounds alone, or at the other extreme it evaluates a programme on equity grounds and proceeds with a recommendation without considering efficiency. An example of the first type is the study by Gannicott cited in Chapter 2 ; an example of the second type is the OECD Clarifying Report on recurrent education.¹

In general, the motivation for recurrent education programmes for older individuals is the desire for equity, a desire to bridge what is called the “edu-

¹ Kallen, Bengtsson and Dalin, op. cit.

cation gap" between generations. Such is the case of Sweden.¹ No mention is made of an efficiency argument, although in some cases of vocational retraining such programmes may be also very efficient. This means that the price at which the equity of the programme is to be bought is not evaluated.

Even equity may not be served well by such programmes. As Eide² and others have pointed out, those demanding and obtaining most post-work education are also those who have had much previous schooling. Unless special precautions are taken, recurrent education programmes may end up in fact having the opposite effect of that desired.

There are some programmes proposed on equity grounds which often could be better defended on efficiency grounds. Thus Schultz gives, for example, the following argument :

The advances in knowledge become an integral part of instruction and as this occurs, they are the source of new skills. But these new skills tend to make the skills of older workers obsolete. It would be very convenient if workers with obsolete educational capital (skills) could be abandoned like obsolete physical capital ! But this option is foreclosed on welfare grounds.³

The implication is that it may not pay to retrain them, but that on equity grounds they should be retrained. There are three reasons why it may be efficient to retrain them. First, the economic lifetime of a skill is often short, so that a young person has no advantage in learning it over an older individual who will be still working when the new skill becomes again obsolete. Second, older workers with work experience in a particular industry may learn certain skills more rapidly than younger unexperienced workers. Finally, the opportunity costs of older workers with obsolete skills may be negligible, especially since their alternative is very often unemployment. In this case the efficiency argument is strong enough by itself ; added to the equity argument, it makes a very strong case for this type of recurrent education programme.

An example of an argument for recurrent education on efficiency grounds where the equity argument is obvious is the issue of psychic returns (returns obtained in the form of satisfaction rather than money). Ribich, in presenting the argument, believes it to be the most underrated and misjudged issue in the economics of education.⁴ The more important problems raised by psychic

¹ See J. Bengtsson : "Intergenerational inequality and recurrent education : The case of Sweden", paper presented at the OECD Recurrent Education Conference, Washington, DC, 18-21 March 1973.

² Kjell Eide : "Recurrent education : General policy options and objectives", paper presented at the OECD Recurrent Education Conference, Washington, DC, 18-21 March 1973.

³ Theodore W. Schultz : "Human capital : Policy issues and research opportunities", in National Bureau of Economic Research : *Human resources*, Fiftieth Anniversary Colloquium VI (New York and London, Columbia University Press, 1972), p. 36.

⁴ Ribich, op. cit., pp. 8-13.

returns can be summarised as : (a) psychic returns complicate the market knowledge problem of the potential investor ; (b) the imperfections of the capital market in relation to investment in education ¹ worsen when the psychic returns component of education is present ; and (c) the existence of psychic returns implies that individuals of equal learning ability and similar preferences will not invest in themselves equally if their initial wealth and income position are not the same, even if capital markets and market knowledge are perfect. Ribich concludes with this statement :

Low-status adults may have an overly low regard for the psychic components of education, and their low income position makes it predictable that they will purchase less than affluent individuals even if they become as convinced as the affluent of the psychic rewards of education. Add to this the more severe capital market problem and the generally weak market knowledge of low-status persons, and a fairly convincing theoretical case results for subsidising recurring education for the relatively poor, independent of equity considerations and without resort of externality arguments. ²

These examples should convince the reader that the relation between efficiency and equity in recurrent education programmes is rather complex. We conclude this section with a somewhat sobering thought on the possibilities of too much recurrent education. The object of recurrent education systems, as suggested, is to expand the individual's freedom of choice, especially at the foot of the social ladder. This, it is hoped, will lead among other things to a more egalitarian distribution of income. As Pen ³ and others have pointed out, if we educate everyone to the limit of his capacities, it may very well happen that inequality of income is intensified because "the untalented, the incorrigibly stupid" lag behind. Furthermore, "the danger threatens that permanent education will lead to permanent stress on performance and achievement, to a concentrated pursuit of success and career, and so perhaps to permanent nervousness". ⁴ In that case perhaps alternative ways of reducing income inequalities should be considered after all.

RECURRENT EDUCATION AND EMPLOYMENT

Although the discussion up to this point has been mainly illustrated with material from developed countries, most of the principles apply equally well to developing countries. Nevertheless, one special point about developing countries needs to be made. Because of the recent explicit adoption of an

¹ See Chapter 6.

² Ribich, op. cit., p. 13.

³ Jan Pen : *Income distribution* (London, Allen Lane The Penguin Press, 1971), pp. 408-409.

⁴ *ibid.*, p. 409.

additional goal (maximising employment) by their policy makers, it is necessary to relate this objective to our adopted criteria for evaluating recurrent education and training.

Until recently the major objective of the governments of developing countries has been the growth of income per head. After that objective is reached, it was argued, fiscal policy could be used to redistribute the output in a socially desirable way. As Thorbecke points out there are at least three objections to this conception of the problem :

First, the political power balance is at least partially related to primary income distribution (before taxes), so that it is very difficult in most developing countries to design and implement policies acceptable to the power groups which would permit redistribution of increased output and corresponding income. Secondly, even if there is a political will to use fiscal and other instruments to alter income distribution, the actual institution, enforcement and administration of these measures is often beyond the administrative capability of these countries. The third objection is perhaps even more fundamental, namely that there is a sense of frustration and lack of human dignity associated with being unemployed which is not going to be removed simply through any income redistribution scheme.¹

More recently, partly in recognition of these points, governments have adopted the additional objective of increasing the number of productive jobs (employment). Now, it should be clear that the attainment of this objective will affect personal and regional income distribution since the link between employment pattern and income distribution is a close one. Thus it turns out that the additional objective of employment growth is mostly an objective of an equitable income distribution in disguise. Since a more equal income distribution is difficult to arrange through fiscal tools, it is being attempted through a policy of increasing employment.

As with our earlier criteria of efficiency and equity, there may be a trade-off between the goals of growth and employment—goals incidentally which closely correspond to the notions of efficiency and equity. However, it should be pointed out that, as in our earlier discussion, certain policies or actions which increase employment may be efficient and thus satisfy the goal of income growth as well.

Having clarified the intent of a policy of employment expansion, it is perhaps well to inquire again about the relation between recurrent education and employment. As we have already said, the contribution of recurrent education to employment creation is not easy to untangle. Since in the rest of the study recurrent education programmes are always compared with the corresponding conventional education programme, it may be of some value to look

¹ Erik Thorbecke : "The employment problem : A critical evaluation of four ILO comprehensive country reports", *International Labour Review*, Vol. 107, No. 5, May 1973, p. 406.

at the relation of conventional education to the employment problem in developing countries. An excellent monograph on that topic by Mark Blaug has recently appeared.¹ After defining the problem and discussing most of the suggested solutions he tentatively concludes :

If the less developed countries maintain their present growth rates, the problem in the foreseeable future will indeed remain that of unemployment heavily concentrated among those aged 15 to 25. On the other hand, there is no easy remedy in sight for youth unemployment and for educated unemployment. The present tendency of educational systems to grow more quickly at the top rather than at the bottom of the educational ladder must somehow be reversed, and I have argued that this can be achieved only by a restructured pattern of educational finance combined with deliberate intervention in labour markets. But to reverse these trends does mean that we shall cure educated unemployment only to create or to aggravate the "school leaver problem". But the remedy for the school leaver problem, at least in the short run, lies in the provision of out-of-school education. In the long run, it lies in the slow and patient reform of primary education from within by curriculum reform, examination and the improvement of teacher training.²

If the problem is as stated briefly in this conclusion, then it is apparent that, in addition to the solutions offered by Blaug, certain recurrent education programmes, particularly of the type suggested in the report of the ILO comprehensive employment strategy mission to Sri Lanka,³ can have the desired effect. Nothing further of value can be said here in general terms. An attempt will be made to point out at the appropriate places the relation between specific recurrent education programmes and the employment problem in developing countries.

¹ Blaug : *Education and the employment problem in developing countries*, op. cit.

² *ibid.*, p. 89.

³ ILO : *Matching employment opportunities and expectations : A programme of action for Ceylon*, report and technical papers in two volumes (Geneva, 1971) (at the time the mission took place, Sri Lanka was known as Ceylon). See also below, Chapter 7.

Any cost-benefit analysis of an investment in recurrent education and training programmes will have to consider a number of further factors if it is to be reasonably complete and accurate. The following will influence a decision for or against a specific recurrent education programme, taken on the basis of the narrower cost-benefit analysis discussed in Chapter 2 : (a) age and deterioration of skill acquisition abilities, affecting costs at different ages ; (b) deterioration of human capital through non-use, which influences skill acquisition costs at any age ; (c) obsolescence of human capital, which will influence both the span of time over which skills are productive and the rate at which productivity decreases ; (d) occupational choice and the information problem, which will influence the optimal timing of investments in relation to the maturing of investors and the risks of making mistakes.

AGE AND DETERIORATION OF SKILL ACQUISITION ABILITIES

This section will be concerned with deterioration of physical and mental abilities resulting from ageing. The deterioration of physical abilities will be given somewhat less space because its nature is more fully known.

1. Physical abilities

Deterioration of physical abilities with age is well established, and therefore only sensory and psychomotor functions will be discussed since they are most relevant to education programmes.¹ The findings on them in the literature are typical of those on other activities as well, and the evidence is so strong that only a brief sample of the empirical studies which support the theoretical

¹ David Wechsler : *The range of human capacities* (Baltimore, Williams & Wilkins, 1952), Ch. IX.

arguments is necessary. Two sensory functions—the visual and the auditory—are of special interest.

The effects of age on vision have been studied from many different angles : visual accommodation, visual acuity, visual fields, etc. Several studies made in the 1930s and 1940s showed that visual accommodation declines sharply with age from under 10 years to around the age of 50, at which time the decline ceases.¹ Acuity increases rapidly until about the age of 20, then remains constant until around the age of 50, at which time it begins to decrease at an accelerating rate.² Although considerable empirical research has been done to determine changes in visual fields with age, no conclusive evidence is available.³

Auditory function is another physical ability that is fundamental for the process of acquiring human capital. It too has been examined from several angles. Tests of audibility range reveal that with increasing age severe loss of ability to hear higher frequency tones occurs.⁴ It has also been found that older workers suffer more auditory damage from sustained occupational noise levels than younger workers.⁵ Deterioration of auditory ability in normal living is not serious until quite late in life.

Psychomotor functions are the bodily implementation of mental commands involving sense organs, an effector organ, and the brain and nervous system as the means of communication between them.⁶ Extensive research into the composition of sensorimotor functions was required in order to obtain satisfactory evidence of age effects on psychomotor capacity.

An example of a psychomotor function which, with age, is limited by the responsiveness of the effector organ (not the nervous system and brain) is physical strength. It is also the best documented function, since the relation between strength and age has been studied at least since 1835, and in every study the same results have been found. Briefly, the research indicates that by the age of 30 (at the very latest) physical strength has peaked and begun a slow decay. A paper by Fisher and Birren summarises the historical results with clarity and brevity.⁷

¹ Alfred D. Weiss : "Sensory functions", in James E. Birren (ed.) : *Handbook of aging and the individual* (University of Chicago Press, 1959), p. 510.

² *ibid.*, pp. 509-510.

³ *ibid.*, p. 519.

⁴ *ibid.*, p. 520.

⁵ *ibid.*, p. 521.

⁶ The following theoretical discussion of psychomotor functioning relies heavily on Alan T. Welford : "Psychomotor performance", *ibid.*, pp. 562-613.

⁷ M. B. Fisher and J. E. Birren : "Age and strength", *Journal of Applied Psychology* (Silver Spring, Md., American Institutes for Research), Vol. 31, Oct. 1947, pp. 490-497.

The reaction time of psychomotor functions is determined by the time required for perception, choice of response and implementation of response. The results of studies measuring reaction time indicate that it does lengthen with age, but only slowly. Reaction times for simple operations, such as pressing a button in response to a light, increase only slightly, and frequently only at advanced ages of 60 or 70.¹ The reaction times for more complex tasks increase with age but not much faster than those for simple tasks.² An experiment by R. A. Brown provided significant evidence that, although reaction times do not vary much with age, the methods of reaction do change.³ In this experiment the younger subjects reacted quickly, but often made mistakes and had to reset their estimate; the older subjects were slower, more careful and made fewer errors. The point is that, as people age and undergo physiological changes, the mode of psychomotor reaction tends to alter so as to compensate for a particular deficiency resulting from the physiological change.

2. Mental abilities

Considerable semantic difficulties arise because of the ambiguity of the term "mental ability". Even though in this chapter mental ability will be confined to "intelligence", the ambiguity persists because intelligence is also not well defined. Since our aim is to determine the effects of mental deterioration on human capital acquisition, we need a rather precise definition for evaluating the empirical studies in the literature. The concept of intelligence adopted is drawn from Raymond Cattell⁴, and John L. Horn's⁵ later elaboration. It divides "intelligence" into two basic types: fluid and crystallised.

Fluid intelligence (FI) is the general ability to discriminate and perceive "relations" independent of education and experience. This type of intelligence is composed of "primary abilities" such as general reasoning, inductive and deductive reasoning, figural relations, span of apprehension, and associative memory. *Fluid intelligence increases until one's early twenties, then*

¹ Alan T. Welford, op. cit., pp. 566-569.

² W. R. Miles: "Correlation of reaction and co-ordination speed with age in adults", *American Journal of Psychology* (Urbana, Ill., University of Illinois Press), Vol. 43, July 1931, pp. 377-391.

³ Alan T. Welford: *Ageing and human skill* (London, Oxford University Press, 1958), pp. 65-72.

⁴ Raymond B. Cattell: "Theory of fluid and crystallized intelligence: A critical experiment", *Journal of Educational Psychology* (Washington, DC, American Psychological Association), Vol. 54, Feb. 1963, pp. 5-6.

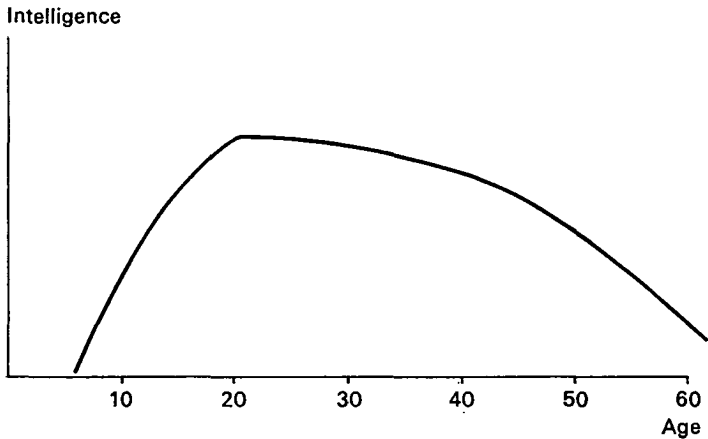
⁵ John L. Horn: "Intelligence: Why it grows, why it declines", in J. McVicker Hunt (ed.): *Human intelligence* (New Brunswick, Transaction Books, 1972), pp. 53-74.

begins an accelerating decline which is caused by physiological deterioration of the organism.

Crystallised intelligence (CI) is experience or discriminating habit acquired initially through FI. It "is a product of environmentally varying, experientially determined investments of FI".¹ It consists of primary abilities such as verbal comprehension, formal reasoning, and experiential reasoning which might be called "social intelligence".² *CI increases over the life span at a decreasing rate.*

There have been quite a number of studies and tests on the age-intelligence relationship which support the above conclusions. Cross-sectional tests³ to examine an individual's FI tend to arrive at parallel results; these are illustrated by Wechsler's growth curve of intelligence (diagram 5). Studies and intelligence tests to examine an individual's CI⁴ indicate that

Diagram 5. The growth curve of intelligence (from Wechsler-Bellevue scale)



¹ Cattell, op. cit., p. 4.

² Horn, op. cit., p. 57.

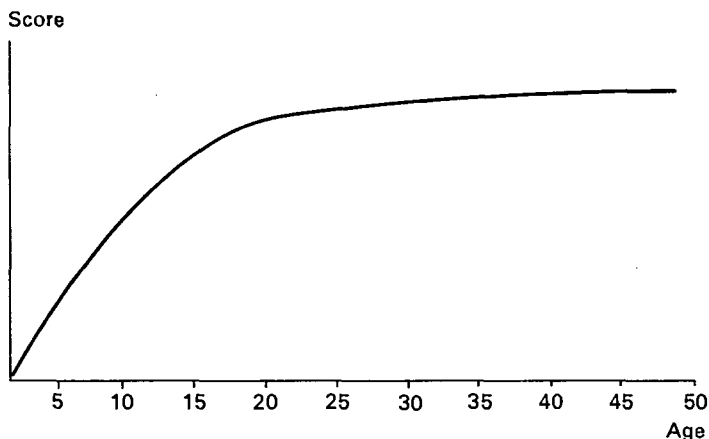
³ See R. L. Thorndike and G. H. Gallup: "Verbal intelligence of the American adult", *Journal of Genetic Psychology* (Provincetown, Mass., Journal Press), Vol. 30, 1944, pp. 75-85; D. F. Vincent: "The linear relationship between age and score of adults in intelligence tests", *Occupational Psychology* (London, National Institute of Industrial Psychology), Vol. 26, Oct. 1952, pp. 243-249; R. M. Yerkes (ed.): *Psychological examining in the US Army*, Memoirs of the National Academy of Science (Washington, DC, US Government Printing Office, 1921); Wechsler, op. cit., pp. 104-106; J. C. Raven: "The comparative assessment of intellectual ability", *British Journal of Psychology* (London, Cambridge University Press), Vol. 39, Sep. 1948, pp. 12-19.

⁴ H. E. Jones and H. W. Conrad: "The growth and decline of intelligence", *Genetic Psychology Monograph* (Provincetown, Mass., Journal Press), Vol. 13, Mar. 1933, pp. 223-298; Raven, op. cit., pp. 15-18; K. Sward: "Age and mental ability in superior men", *American Journal of Psychology*, Vol. 58, Oct. 1945, pp. 443-479; R. J. Corsini and K. K. Fassett: "Intelligence and aging", *Journal of Genetic Psychology*, Vol. 83, Dec. 1953, pp. 249-264.

there is no decline until around the age of 60. Throughout a person's life span it is the combination of fluid and crystallised intelligence which is important, but early in an individual's life that combination becomes loaded heavily with CI. Education and social experience become increasingly important as the brain and nervous system suffer deterioration, through ageing.

However, the results from the cross-sectional studies seem to be contradicted by the results of a number of longitudinal studies.¹ The rather strong indications from these prompted Nancy Bayley to construct a "composite age curve of intelligence" based on the Owens, and Bayley and Oden results.² This curve, depicted in diagram 6, is obviously quite different from the initial age-intelligence curves based on cross-sectional studies (diagram 5). How can these two results be reconciled? Part of the reconciliation has already been performed. Any study which relates exclusively CI with age will have quite different results from one that relates FI with age (e.g., the results of Wechsler and Owens). The other aspect of the reconciliation is methodological. Not only is there a correlation between test results and the

Diagram 6. Bayley's composite age curve of intelligence



¹ M. Glanzer and R. Glaser: "Cross-sectional and longitudinal results in a study of age-related changes", *Educational and Psychological Measurement* (Durham, NC), Vol. 19, Spring 1959, pp. 89-101; W. A. Owens: "Age and mental abilities: A longitudinal study", *Genetic Psychology Monograph*, Vol. 48, Aug. 1953, pp. 3-54; idem: "Age and mental ability: A second adult follow-up", *Journal of Educational Psychology*, Vol. 57, Dec. 1966, pp. 311-325; V. J. Bentz: "A test-retest experiment on the relationship between age and mental ability", *American Psychologist* (Washington, DC, American Psychological Association), Vol. 8, Aug. 1953, pp. 319-320; Nancy Bayley: "On the growth of intelligence", in Leona E. Tyler (ed.): *Intelligence: Some recurring issues* (New York, Van Nostrand Reinhold, 1969), pp. 161-162.

² Nancy Bayley: "On the growth of intelligence", *American Psychologist*, Vol. 10, Dec. 1955, pp. 805-818.

type of intelligence tested, but the results are also strongly correlated with the type of population sample used : cross-section or longitudinal.

Ageing and cohort succession are separate dynamic processes. As individuals in each cohort age, they accumulate knowledge and social experience while undergoing biological and psychological changes. This ageing process is a particular "life-course pattern" ; differences between individuals of the same cohort but of different ages are "life-course differences".¹ Along with the ageing of the first cohort, a second (and third) ageing process is occurring in a second (and third) cohort. Simultaneously, the society in which all of these cohorts exist is changing ; therefore, each new cohort encounters a unique sequence of social and environmental events. Each different cohort ages in a different way, and these differences in cohort ageing are "cohort differences". Studies using cross-sectional data will not be able to delineate the unique processes affecting the data and therefore may draw fallacious conclusions.

This argument based on the distinction between cohort succession and ageing has been generally accepted by current researchers.² It is accepted here as partial explanation for the contradictory results of some empirical studies. In addition, the curve derived from the cross-sectional studies usually excluded ability derived from CI which compensates for the rather rapid deterioration of FI. Eliminating those two "errors" removes the inverse portion of the curve, leaving a relationship approximated by diagram 5.

The development of intelligence over the life-cycle is a dynamic process involving different combinations of the brain, nervous system and environment at different points in time. Very early in life physiological deterioration of FI begins. An individual attempts for the remainder of his life to compensate for it by relying on his CI. From the cited empirical evidence it is apparent that people are successful up to a point in their compensating efforts. The level of performance achieved through compensating techniques may be retarded or increased by other factors, such as motivation or responsibility.

¹ The systematic argument and terminology are from Matilda W. Riley : "Aging and cohort succession : Interpretations and misinterpretations", *Public Opinion Quarterly* (New York, Columbia University), Vol. 37, Spring 1973, pp. 35-49.

² See L. E. Tyler : *The psychology of human differences* (New York, Appleton-Century-Crofts, 1965), p. 286 ; and H. E. Jones : "Intelligence and problem-solving", in Birren : *Handbook of aging and the individual*, op. cit., pp. 717-718.

3. Implications for recurrent education

Two main implications may be inferred from the empirical studies : (a) the deterioration of physical abilities necessitates compensatory behaviour requiring flexibility in time schedules and work pace ; (b) intelligence will not begin to deteriorate until as late as 50 years of age, assuming that CI develops properly.

Although each implication is based on different empirical studies, the two are strongly interdependent. The development of CI hinges initially upon the use of FI to consolidate and integrate environmental experiences. Later, an individual's intelligence requires use and stimulation for its maintenance, since it is strongly dependent upon experience ; this implies that non-use (described below in greater detail) contributes to the deterioration process by arresting the dynamic growth of intelligence. The physiological deterioration of sense organs and effector organs decreases a person's ability to integrate his environment and use his experiential learning, so that the growth of intelligence is also slowed down.

If human capital, or the ability to acquire it, suffers from deterioration, then recurrent education proposals must be designed so that such deterioration does not affect efficiency. The efficiency criterion for such education implies that by providing either different age-groups with education or the same population with education at a different time in the life-cycle, the stock of human capital will be increased—with no increase in resource expenditure. In fact, most of the proposals include an argument that efficiency (more education with less resource expenditure) will increase.

DETERIORATION OF HUMAN CAPITAL THROUGH NON-USE

The non-use of human capital for a lengthy period of time may lead to a serious deterioration of skills, knowledge, good working habits, etc. This occurs often in the case of workers (and professionals) subject to long periods of unemployment. The problem may be even more serious in the case of women who, after their education, spend 10 to 15 years outside of the labour force, while engaged in child-rearing activities. However, direct evidence that skills or the ability to acquire them deteriorate with non-use is scattered and tenuous. Results from two very similar tests performed some 30 years apart indicate the general trend of the results. Herbert Sorenson found that, in a group of public-school teachers taking university courses, those who had been regularly involved in a learning environment outperformed those who had returned to the classroom for the first time in many years (with other

factors such as study time held constant).¹ In a 1965 study of the performance of a test group faced with a new learning situation, the above results were substantiated ; those members of the group who had recent academic experience outperformed the non-experienced members significantly.²

Additional light on deterioration from non-use is thrown by the empirically supported theory of intelligence. Cattell, in his original specification of CI, suggested that it was composed, in a multiplicative manner, of three aspects : (a) the amount of time in earlier periods devoted to using one's abilities in a whole range of "intellectual performances" (*T*) ; (b) the average strength of interest in learning in earlier time periods (*I*) ; and (c) the level of fluid intelligence over these earlier learning periods (*FI*).³ Consequently, any change in any one of the components will affect CI ; more specifically the implication is that "learning begets learning", in the sense that the use of one's abilities has an effect on CI in future periods of time.

As it is rather clear that non-use of skills and knowledge leads to their deterioration, it would be useful to analyse the efficiency of recurrent education programmes aimed at updating the skills and knowledge of individuals with a view to reintegrating them in the labour force. Studies have been carried out to determine the costs and benefits of retraining the hard-core unemployed as compared to other individuals. A study by Borus on retraining programmes in Connecticut showed that it is more expensive to train the hard-core unemployed because their level of education is usually lower so that they are more likely to need additional and remedial basic education, and because their cost in training allowances and their drop-out rates will be higher.⁴ However, when trained, they were able to find employment that was usually of a highly stable kind, their annual income increase was twice that enjoyed by more employable workers, and the reduction in government unemployment payments was more than seven times greater for the retrained and re-employed hard-core group than for the other retrainees. Nevertheless, the economic benefits of such recurrent education programmes for hard-core unemployed do not match the costs. Economically, it would be sounder to concentrate on retraining the better qualified workers. Their capacity and motivation for training are greater and they can be trained for certain higher-level posts that the hard-core unemployed could never hold even with optimum training. In addition, the less employable workers would still benefit

¹ H. Sorenson : *Adult abilities in extension classes* (Minneapolis, University of Minnesota Press, 1933).

² D. D. Sjogren and A. B. Knox : *Influence of speed and prior knowledge and experience on adult learning* (Lincoln, University of Nebraska, 1965), pp. 8-9, 80-81.

³ Cattell, op. cit., pp. 7-10.

⁴ M. E. Borus : "The cost of retraining the hard-core unemployed", *Labor Law Journal* (Chicago), Vol. 16, No. 9, Sep. 1965, pp. 574-583.

indirectly through a “vacuum” effect, since when any worker is upgraded he leaves a vacancy into which an unemployed person of lower skill level will be drawn.

These conclusions are consistent with the findings of Sorenson, Sjogren, Knox and Cattell mentioned above (and with the findings described in the section on age and deterioration of skill acquisition abilities), which are that knowledge and the capacity to acquire it tend to deteriorate through non-use, with age, or when the educational background is meagre. These findings would seem to speak against recurrent education programmes in such cases because of their high cost when compared with alternative programmes.

However it remains to be shown whether, on equity grounds, such programmes should be further considered for some of the groups who have “suffered” from non-use of their knowledge and skills and want to re-enter the employment market (e.g. women).

The emphasis in justifying a particular recurrent education proposal should be placed on criteria other than the fact that age and non-use may have deleterious effects on human capital, and its acquisition. However, the evidence cited in the last two sections indicate limits outside of which such justified proposals will involve inefficiency.

OBSCOLESCENCE OF HUMAN CAPITAL

For purposes of the present discussion, obsolescence is characterised by the decreasing usefulness of previously acquired skills. More generally, any process by which an individual with a fixed set of skills finds these increasingly in less demand in his work, or in extreme cases no longer in demand at all, will be regarded as obsolescence.

Obsolescence of human capital may modify considerably certain arguments against recurrent education.¹ In an economy in which technological change occurs at a rapid pace there are a number of jobs that disappear or require new skills and knowledge. Workers can be educated and trained for these positions, but this human capital—although vital at the time—often has a very limited economic life span. Techniques change and old skills and knowledge may become obsolete overnight. Examples of such changes abound in the mechanical industries, the aircraft and space industries, and in general in the technologically prominent sectors of the economy, where equip-

¹ A good discussion of problems of educational obsolescence, with an interesting policy proposal, can be found in S. Mushkin: “Resource requirements and educational obsolescence”, in E. A. G. Robinson and J. E. Vaizey (eds.): *The economics of education*, Proceedings of a Conference held by the International Economic Association (London, Macmillan ; New York, St. Martin’s Press, 1966), pp. 463-478.

ment changes often and requires competent supervision, maintenance and repair. There is a literature in most countries describing such problems and the attempted education and training solutions in various branches of economic activity : the automation crisis in the electro-mechanical industries in the Federal Republic of Germany ¹ ; the impact of technological change on the offshore maritime industry in the United States ² and on the merchant navy of the United Kingdom ³ ; the repercussions of technical progress on the training and personnel structure in the rolling mills of the Common Market countries ⁴, on the building industries in the USSR ⁵ and on the pulpwood logging industry in Canada. ⁶

A recent survey on the impact of technological advance on a cross-section of the United States labour force concludes :

Over a five-year period about 10 per cent of the labour force underwent one or more changes in machine technology which (in their own view) altered their work significantly. Another 12 per cent experienced a machine change as a result of a job change, where the job change was (again in their own view) not caused by a change in machine technology. True, in some cases workers may not see some of the more remote and indirect forces which make a job unsatisfactory and induce them to seek other employment. Still, we must conclude that, percentage-wise, technological advance changed relatively few jobs to a significant degree—about 2 to 3 per cent a year. In rough absolute terms, such percentages imply 1.5 to 2 million members of the labour force a year, not a small number at all. ⁷

The survey, furthermore, brings some long-standing myths to rest. ⁸ It finds little evidence that technological change determines the precise inci-

¹ C. Kellner : "Wird die weitere Mechanisierung durch Facharbeitermangel im Elektro- und Maschinenbetrieb erschwert ?", *Glückauf* (Essen), Vol. 99, 1963, No. 18, pp. 993-996 ; Arbeitsring der Arbeitgeberverbände der Deutschen Chemischen Industrie : *Auswirkungen der technischen Entwicklung auf die Ausbildung von Reparatur- und Wartungsarbeitern und von Anlagenfahrern (Maschinenführer) in der chemischen Industrie* (Wiesbaden, 1965).

² A. W. Warner : "Technology and the labor force in the offshore maritime industry", in Industrial Relations Research Association : *Proceedings of the Eighteenth Annual Winter Meeting* (Madison, Wis., 1966).

³ J. C. Thomason : "Changes in the training of merchant navy engineer officers", *Technical Education and Industrial Training* (London), Vol. 8, 1966, No. 11, pp. 492-495.

⁴ Institut für Sozialwissenschaftliche Forschung (Munich) : *Les répercussions du progrès technique sur la structure et la formation du personnel dans les laminoirs* (Luxembourg, Communauté Européenne du Charbon et de l'Acier, Haute Autorité, 1966).

⁵ N. Akimova : "Vazhny faktor uluchshenie stroitel'stva", *Planovoe Khoziaistvo* (Moscow), Vol. 43, 1966, No. 5, pp. 27-34.

⁶ D. R. Campbell and E. B. Powers : *Manpower implications of prospective technological change in the Eastern Canadian pulpwood logging industry* (Ottawa, Department of Manpower and Immigration, 1966).

⁷ Eva Mueller : *Technological advance in an expanding economy : Its impact on a cross-section of the labor force* (University of Michigan Survey Research Center, 1969), p. 10.

⁸ *ibid.*, pp. 11-15.

dence of unemployment. Often firms that introduce labour-saving machinery can rely on normal retirements and resignations, and on expanding markets, to bring their labour needs and supply into balance. The burden of unemployment resulting from the introduction of new machinery is borne by the less well placed, less educated, elderly member of the labour force who has to wait longer for a job. Skilled and experienced people who are laid off tend to find new employment quickly. The well educated who work with new machines and equipment do not complain about unused skills : in fact they express a need for further education and training.

Obsolescence implies that the training costs have to be amortised over the period for which the training is of value. It is clear that in this case there is no argument against training older people for tasks which will have a life span of a few years only. Postponement is not a possible solution since the training is not available until the new technique is available, i.e. an older worker could not have been trained in the technique when he was young. The argument based on the number of years over which the returns are collected does not hold as long as the life span of the new training is equal to or shorter than the expected working life of the worker. It might still be argued that the older worker may have higher forgone income during training because of his greater on-the-job experience, but this argument can cut both ways. Greater on-the-job experience may be complementary to training for a new technique, so that on the whole it might look more efficient to employers to train older and experienced workers for new tasks. At any rate there is no *prima facie* argument here against training older workers.

Furthermore, it is often the case that training of the type described here is "produced" jointly with ordinary production. Thus there may be complementarities between training and not only previous experience but also present production, thus increasing the value of offering recurrent training within the firm for personnel of an older age-group.

The individual faced with obsolescence has three possible courses of action. He may, of course, do nothing. Remaining in his current occupation without any skill updating, he must expect a steady decline in his wages or unemployment. The greater the rate of technological advance (and thus of potential obsolescence) the greater will be the expected rate of decline, though this may be offset by such non-technical factors as popularity, racial bias, convenient kinship or marital relations, or job security. The second course of action is to eliminate (or mitigate) the obsolescence through some retraining mechanism (to be discussed below). The third option is for the worker to leave his present job and to move to one for which he still is adequately skilled (the engineer who moves to a position of management at mid-career is the most familiar example).

Employers have a related set of options for dealing with obsolescent employees. One is to dismiss employees with obsolete skills in favour of recent graduates. This course of action is, in general, undesirable on grounds of both equity and efficiency : it would eliminate any complementarities between formal schooling and work experience, might engender the wrath of labour organisations, and is not acceptable in a humane society. Another is to move the individual from position to position, but downward occupational mobility at mid-career is unacceptable on a large scale in any organisation. The employer then, like the worker, will find maximum utility in some programme which faces up to obsolescence and turns it back.

It is now possible to consider what characteristics would maximise the effect of a recurrent education programme for dealing with human capital obsolescence. This task must be undertaken with the constant realisation that one is "treading upon thin ice" in so doing. Obsolescence is still a tenuous, unquantified concept. What one author calls obsolescence (and hence what he finds to be a remedy for it) may be radically different from the way in which the word is used in an article by another.

Margulies and Raia ¹ interviewed technical personnel to determine what types of experience served best to keep them up to date. Their findings (for 290 interviews) are as follows :

	Percentage of respondents
On-the-job problem solving	42
On-the-job colleague interaction	20
Publishing and independent reading	16
Formal courses	14
Outside professional activities	4
Other	4
	<hr/> 100

The above findings are consistent with a proposition of Seifert ² that formal course work is fine for those recently educated but is not at all beneficial for those who lack a recent academic background. Following a theme presented by Seifert ² and French ³, it appears, in the light of the data of Margu-

¹ Newton Margulies and Anthony P. Raia : "Scientists, engineers, and technological obsolescence", *California Management Review* (Los Angeles, University of California Press), Vol. X, No. 2, Winter 1967, pp. 43-48.

² William W. Seifert : "The prevention and cure of obsolescence in scientific and technical personnel", *Research Management* (New York, Industrial Research Institute), Mar. 1964, pp. 143-154.

³ Earl B. French : *Personnel problems in industrial research and development* (Ithaca, NY, New York State School of Industrial and Labor Relations, 1963).

lies and Raia, that placing the older (experience-rich), technically obsolescent individual in maximum contact with the younger (methods-rich) individual provides the best anti-obsolescence programme. In the case of individuals who have proceeded relatively far along the path of obsolescence, a term of service in a particularly "methods-rich" group working on some particularly demanding project might be an adequate remedial measure.

Consider Mueller's case studies of 12 individuals who had relatively poor adjustments to technological change.¹ Of these, only two expressed any felt need for further education, while six actually disclaimed any such need. Both of those who expressed a desire for more education were among the four case studies who had received some post-secondary education.

If one can assume Mueller's cases to be representative of the labour market as a whole, then the argument of French² is supported by this information, i.e. the individual who values education will adjust positively to technological change.

Empirical evidence allows a rather unambiguous answer to the question of which groups of the working population are particularly vulnerable to obsolescence, and consequently would be the priority clients for recurrent education programmes. The richer the educational background (in terms of quantity and quality) the smaller is the risk of obsolescence. In general, technical and specific education and training are more subject to obsolescence than general education and knowledge. Consequently, priority clients for recurrent education programmes would be those with a relatively small educational background in the technical trades and occupations rather than those with a large educational background in the professions. Furthermore, as a rule, it can be said that it is part of the job of (for instance) medical doctors, engineers and university professors to keep abreast of new developments in their respective fields. Normally a proportion of their working time is devoted to learning activities.

Increased attention given in early years to the development of those intellectual capabilities which facilitate the individual's ability to adjust to change in later life would also contribute to reducing considerably the risk of obsolescence. Taking into account the considerations contained in the latter part of this section, the optimal role of recurrent education as an antidote for human capital obsolescence seems to be preventive rather than curative. Efficient programmes which would maximise the possibility of the non-

¹ Mueller, *op. cit.*, Chap. 7.

² French, *op. cit.*

obsolete (or not-yet-obsolete) individual to keep abreast of current technology (optimally through a series of many sessions) are more attractive than attempts to isolate obsolete individuals and to enroll them in formal course work.

OCCUPATIONAL CHOICE AND THE INFORMATION PROBLEM

The fourth factor to be considered is that, when choosing to invest in skills acquisition, an individual's basis of information is limited. Education decisions are usually made in the face of considerable ignorance : ignorance about oneself, ignorance about the production of skills, ignorance about the future values of these skills.

The importance of work roles in social and self-identification places the young person anticipating the transition into the world of work in a dilemma. He must not only be able to identify those characteristics of himself which will be marketable in the world of work, but he must understand how his own individual uniqueness will fit into a particular work role. Yet in modern society the young adolescent is isolated from the mainstream of socially meaningful activity. This creates within the individual a crisis of self-identification.

In addition to separating geographically the areas in which family and work roles are performed and creating a clear distinction between paid and unpaid forms of work, modern society has transferred the traditional learning functions from the family to the school, which is physically separated from the family and the world of work. In a traditional society, crafts and trades were identified with particular families and kinship groups. The young person in these societies learned his occupational skills from the training furnished by his parents and relatives. In addition to learning the skills needed to follow his occupation, he also learned the expected norms of behaviour within the class or caste as well as how to behave regarding other social groups in society. With industrialisation and the proliferation of occupations, the family became an inefficient means of teaching the child the skills necessary to perform in the world of work. The school became increasingly the source of training for that world. As technology advanced and required more highly trained and skilled individuals, the school became an important component of the process of moving into an occupation.

The growth in the number of occupational options open to the individual has resulted in a corresponding increase in the "freedom of choice" available to the individual. Yet with an expansion in freedom has come the increased complexity of the decision process. The limited range of options open to an individual in a traditional society and the combination of family, school and

work activities in the home reduced the complexity of the process of growing up and moving into the world of an adult. In a modern industrialised society, freedom of choice among occupations involves both a need for information about the nature of occupations and a means of evaluating individual aptitudes and skills. In view of the increasing complexity of the world of work and of all the uncertainties and risks, how do individuals make educational and occupational choices ?

1. Occupational choice as a process

The last two decades of literature in the area of occupational choice has been dominated by the work of Eli Ginzberg, Donald Super and Anne Roe.¹ The primary contribution of Ginzberg and Super was the introduction of the notion of occupational choice as a process. This was a decisive improvement over the earlier notion among vocational guidance personnel that occupational choice was basically the matching of an individual possessing a set of observed characteristics or traits with a particular occupation in which these traits seemed important. Work in the area of occupational choice has been centred mainly on validation of the theories of Ginzberg, Super and Roe by empirical studies. It has been largely based on samples drawn from student bodies of college-age individuals. This has in part been due to the difficulty of eliciting the support of other groups in society.

Regarded as a process, occupational choice ceases to be a single decision at a given moment and becomes a series of decisions over time. For Ginzberg, the process was viewed as having three dimensions. First, it involves a progression over time from a level of generalisation to specification; in other words, the process of movement into an occupation occurs in stages, with each stage progressively narrowing the range of alternatives. Second, the process has an aspect of irreversibility in it. With the narrowing of alternatives and the interdependency with decisions made previously, each additional decision tends to follow from previous ones. To alter or reverse the process may involve the individual in a loss of time. Third, the process requires the individual to compromise between his known and perceived abilities and aptitudes and the realities and constraints in the world of work.

Ginzberg conceives the process of occupational choice as occurring in three distinct stages. The first stage he calls "fantasy". This corresponds

¹ Eli Ginzberg, Sol W. Ginsburg, Sidney Axelrad and John L. Herma : *Occupational choice : An approach to general theory* (New York, Columbia University Press, 1951) ; Donald E. Super : *The psychology of careers : An introduction to vocational development* (New York, Harper & Brothers, 1957) ; and Anne Roe : *The psychology of occupations* (New York, John Wiley ; London, Chapman & Hall, 1956).

approximately to the ages 10 to 12 years. The primary characteristic of this stage in the process is the child's desire to be an adult. He identifies with an adult whom he may admire or like, but has no conception of his abilities and aptitudes and their relationship to success in the occupation. Also the child is unaware of the constraints and limitations which the world of work may impose on the achievement of this occupational goal. The next stage is that of "tentative choice". This corresponds to the ages 13 to 19. It is the first time that the individual considers himself as an entity. There is pressure from family members, and he becomes aware that he must make a choice regarding a career. He also begins to realise the permanency and seriousness of the decision ; yet the concept of self is not firm, and he tends to feel unsure about his personal attributes and the attributes of the world of work. At the same time his efforts to learn more about himself and the world of work are thwarted by his dependency relationship in the home and by the isolation of the school environment from the environment of work. The next stage in the process of occupational choice is the "realistic stage". This corresponds to the years of early adulthood following the age of 19. The individual realises the need to make a definite choice, and the pressure to move into the world of work is stronger than it was during the tentative stage, when he tended to vacillate between occupations. For the college-bound individual this is the point at which he begins to move away from the physical dependency of childhood. For the young high-school graduate who is not going to college, this is the point at which he enters other types of training or the labour force. For this latter group the process of occupational choice is often marked by a series of short-term employments. It is during this period that the individual is testing his aptitudes and abilities under different work situations. It is also the period in which he begins to construct a more realistic notion of his own abilities and aptitudes and the requirements of different occupations.¹

The realistic stage is divided into three sub-stages. The first of these is called "exploration". The individual is involved in testing himself in new situations. For the student in college, this period may be marked by new social contacts and new challenges in the course work ; he begins to get a clearer notion of himself and of the way in which others perceive him. Similarly, for the individual who decided to enter the world of work after high school, this period is marked by self-testing in different work and personal situations. The period is also marked by self-doubts which stem from an inadequate concept of self.

¹ Ginzberg *et al.*, *op. cit.*, pp. 59-72.

The next sub-stage is “crystallisation”. This is “the process whereby the individual is finally able to synthesise the many forces, internal and external, that have relevance for his decision”.¹ He may become increasingly aware that specific occupations require special training. He has begun to narrow down considerably the range of alternatives open to him. The crystallisation sub-stage is followed by one of “specification”. This is the final commitment to a particular occupational area. The individual has decided upon an area in which he wishes to specialise. For the college student, specification involves the decision to take a particular course within a field : for example, the engineering student decides to follow a chemical as opposed to a mechanical engineering course. The young adult who did not opt for college decides to become an automobile mechanic after vacillating between different types of mechanics. He may also decide at this point to undertake specialised training in his chosen area.²

2. Uncertainty and background influences

Super's work follows very closely the work of Ginzberg, placing emphasis on the concept of self.³ Roe's work centres primarily on developing a theory of occupational choice relating future occupational decisions to childhood experience.⁴ Further to the above it can be said that occupational choice is probabilistic.⁵ It involves the careful weighing by the individual of his own perceived characteristics and the characteristics of the labour market. Not only must the individual evaluate the decision in terms of the current state of these conditions but he also must be able to project his expectations about his personality and changes in the labour market over time. Therefore, the decision regarding occupation is one involving risk and uncertainty.

The process of obtaining a college education is not only costly but quite risky as well. A particular student does not really know, in any precise way, the quality of the services he will receive from an educational institution. Moreover, these services are only one of several inputs to the educational transformation. The student is also likely to be at least partially ignorant concerning his ability to make use of what the higher educational sector provides and, more important, of the value of the product produced by those inputs and with his own efforts and abilities. Some types of education are narrowly vocational in character ; much professional education at the postgraduate level in medicine, law, business, and engineering may also be of this nature, as recent events bring home. The demands by the

¹ Ginzberg *et al.*, op. cit., p. 107.

² *idem*, pp. 95-117.

³ Super, op. cit., pp. 80-100.

⁴ Roe, op. cit.

⁵ Yoram Weiss : “The risk element in occupational and educational choices”, *Journal of Political Economy*, Vol. 80, No. 6, Nov./Dec. 1972, pp. 1203-1213.

economy for particular sorts of educated people are constantly changing ; to the extent that a college education specifically "fits" an individual for a particular profession or occupation or specifically prepares him for postgraduate training which does so, an element of substantial risk is introduced into the calculation of the worth of an investment in a college education.¹

Although this passage relates to the decision to invest in a college education, it is appropriate to the broader issue of occupational choice. A chosen occupation, particularly in an industrialised and technical society, requires special training. This training may take the form of learning through experience on the job or of formal education and training (college, vocational school, etc.). The individual faced with the decision must be aware of the alternative means of acquiring training, as well as of the relationship between specific occupations and the career pattern he wishes to follow.

The nature of the risk involved in an occupational choice decision like that of undertaking education will differ according to the individual's situation and way of responding to it. One who is very uncertain about his ability to perform well in the training situation or at college may attempt to lessen the uncertainty by opting for a less demanding programme. Uncertainty about his ability to achieve a particular occupational goal may also influence his choice of occupation. In a study of the impact of social class on the occupational aspirations of young people, Ellis and Lane found that individuals in college from a lower social class tend to have lower occupational horizons and aspirations than those from the upper social classes.²

Characteristics of the home or family background are important determinants in the occupational choice decision of the individual. For example, individuals from lower socio-economic status families are more likely to enrol in programmes of vocational or commercial training in high school than individuals from the upper classes.³ The relationship with socio-economic status is stronger for females than males, particularly for the decision to continue education beyond high school.⁴ In a sample of young adults in Greensboro

¹ Marc Nerlove : "On tuition and the costs of higher education : Prolegomena to a conceptual framework", *Journal of Political Economy*, Vol. 80, No. 3, Part II, May/June 1972, p. S185.

² Robert A. Ellis and W. Clayton Lane : "Social mobility and career orientation", *Sociology and Social Research* (Los Angeles, University of Southern California), Vol. 50, No. 3, Apr. 1966), pp. 280-296.

³ Rupert N. Evans and Joel D. Galloway : "Verbal ability and socioeconomic status of 9th and 12th grade college preparatory, general, and vocational students", *Journal of Human Resources* (Madison, Wis., University of Wisconsin Press), Vol. VIII, No. 1, Winter 1973, pp. 24-36.

⁴ William H. Sewell and Vimal P. Shah : "Social class, parental encouragement and educational aspirations", *American Journal of Sociology* (Chicago, University of Chicago Press), Vol. 73, No. 5, Mar. 1968, pp. 559-572.

(North Carolina), Adams and Meidam found that the father's occupation was a critical determinant in the decision to seek a college education. Individuals from white-collar families are more likely to go to college than individuals from blue-collar families. In addition, Adams and Meidam found that, within a family, males are more likely than females to go to college. The effect of the number of siblings is more apparent for females from blue-collar families : as the number of brothers increases, the number of females going to college decreases. This relationship is not found to exist among white-collar families.¹

In making the occupational decision an individual must also weigh his or her expectations about roles in areas other than work : for example, the demands of family responsibilities and the requirements of leisure activities. These considerations are more important for the female making an occupational decision than for the male. Generally, the traditional role of husband and father is compatible with an occupational decision ; for the female the choice of career outside the home is complicated by the incompatibility between her traditional role as mother and wife and the career role. Therefore, the decision to undertake a particular type of training leading to an occupational goal must be weighed against anticipated roles in the home and the compatibility of these goals with the objectives of the husband's career.

The main points which can be drawn from the literature of psychology and sociology regarding occupational choice are the following. First, occupational choice is a complex process taking place over a period of time. Second, the process closely corresponds, at least during the initial period, with biological maturation of the individual. Third, the process involves the development of self-perception : the notion of self is influenced by an individual's aptitudes, abilities, expectations and skills, as well as by external factors such as family socio-economic conditions, inter-personal family and non-family relationships, and reinforcement both in and outside the home. Fourth, the notion of self is linked to the experience of the past and present, and to future expectations. Fifth, work is an important element in personality development and the defining of individual identification. Sixth, the process of occupational choice in an industrialised society is separated geographically and physically from the work environment.

¹ Bert N. Adams and Miles T. Meidam : "Economics, family structure, and college attendance", *American Journal of Sociology*, Vol. 74, No. 3, Nov. 1968, pp. 230-239.

3. Implications for recurrent education

Having considered the process of making an educational and occupational choice as well as some of the factors influencing such choices, the question arises as to their relation with recurrent education programmes. This will be considered under three headings.

(a) *The process of an occupational choice.* The case for defining specialised training has been put by Bowman :

Once the assumption of full knowledge is dropped and we look at actual behaviour, the sequence of private decision-making takes on other aspects. Part of the investment becomes investment in the acquisition of knowledge about one's self and about opportunities in the world around. Moreover, decisions on "first moves" will take into account the extent to which what is done now may narrow the range of choices available later. Maintaining flexibility of future choice may be as important as making the optimal choice, and in fact much more feasible. Thus uncertainty, including self-uncertainty, will encourage exploratory rather than delimiting self-investments, keeping open the channels of feed-back correction for error. There is then a strong case for deferment of specialised training.¹

The type of uncertainty discussed here cannot be reduced by any government insurance scheme.² It can be reduced, as Bowman suggests, by a postponement of higher education for a reasonable period of search, say of a year or two. If such a period can sufficiently reduce the risk of having picked the wrong specialisation, it can more than make up for the possible losses involved in the postponement. This phenomenon is especially important when programmes involving the slight postponement of higher education are evaluated.

(b) *Occupational choice in relation to age.* In almost all countries a large proportion of youngsters leave school after the compulsory schooling period, and make up their minds as to the type of specialised training they want or the trade or occupation they will work in before the age of 19. According to Ginzberg the age period before 19 (from 13 to 19) is one of "tentative choice", where the concept of self is not firm and the individual tends to be unsure about his personal attributes and the attributes of the world of work. This would imply that youngsters making their occupational decision during this age period have only a small chance of picking the career which best fits their capabilities and expectations. Three alternative solutions appear to merit special consideration in this context.

¹ M. J. Bowman : "The costing of human resource development", in Robinson and Vaizey (eds.) : *The economics of education*, op. cit., p. 446.

² For a discussion of the reducible and non-reducible risk and uncertainties in education, see Nerlove, op. cit.

The first is a postponement of specialised training until after the age of 19 years, which corresponds (according to Ginzberg) to the “realistic stage” of occupational choice. This would mean that youngsters either (a) stay in school, which would increase the educational expenditure without significantly increasing their possibilities of knowing more about the world of work ; or (b) take up a series of employments not requiring specialised skills and knowledge, which on the one hand would contribute to a realistic occupational choice but which on the other hand have the negative effect of making it difficult for the individual to leave employment to undertake long-term (2-3 years) training without payment, at an age where most youngsters build up families ; or (c) do nothing, the negative effects of which do not need to be further explained.

The second solution is to let youngsters undergo vocational guidance or orientation, which would increase their knowledge about their personal attributes of the world of work. This increase in knowledge will diminish the risk of a wrong choice.

The third solution is to let youngsters be trained early, but to set up corrective measures, e.g. recurrent education and training programmes which would provide—at a later stage—the possibility of further training or retraining.

A precise cost-benefit analysis of the three alternatives would call for answers to a set of questions which have not been dealt with extensively in the literature. Nevertheless, whatever the answers to these questions, Ginzberg’s theory on the different stages of occupational choice strengthens the case for recurrent education programmes for a large part of the population which, at an apparently too early time in life, has made the choice of a skilled trade or occupation.

However, the case for *significant* postponement of higher education appears once again rather weak for two reasons. First, occupational choices made after the age of 19 (“realistic stage”) have, according to Ginzberg, a reasonable chance of being accurate (significantly better than choices made during the “tentative choice” stage). Second, the existence of the increasingly popular “co-operative education” programmes, which generally involve the alternation of a semester of work with a semester of study, give additional assistance to the individual in selecting an occupation. This type of programme offers an opportunity of rethinking one’s occupational choice before the cost of having made a mistake increases too much.

(c) *Occupational choice in relation to socio-economic class.* The available literature confirms the close relationship of occupational aspirations and choices with the socio-economic class of origin and the environment in gen-

eral. It is apparent that the level of aspirations and the occupation chosen are directly proportional to the level of the individual's socio-economic background. Therefore, if only on equity grounds, it would seem necessary to undertake some kind of corrective educational action in favour of some groups of the population. These would be mainly individuals from the lower economic classes, and women whose occupational aspirations and choices have traditionally been hampered by their environment. Here again, any corrective action would have to include better guidance and information on available educational and occupational opportunities, as well as recurrent education programmes providing opportunities for retraining and further training.

EXAMPLES OF RECURRENT EDUCATION PROGRAMMES

5

After the foregoing discussion of the criteria and other elements for an evaluation of recurrent education programmes, this chapter gives five examples of such programmes. These cover recurrent education at the secondary level (intensive programme for the preparation of industrial labour) and higher level (training of village-level workers), a programme of a permanent character (recurrent education for women) and of a temporary nature (recurrent education for ex-servicemen) and, lastly, the introduction of recurrent education as a nation-wide system (the case of France).

As a whole the examples selected cover a great number of the programmes suggested in the literature. The analysis is suggestive rather than exhaustive, and considerably more work will be required for a definitive evaluation. But on the whole, the programmes analysed can be justified on efficiency or equity grounds, or both. Once they are specified in sufficient detail, they can be seen to be sensible programmes. Examples of unjustified programmes will be encountered in the chapters that follow.

It should be stressed here again that the examples taken are only programmes which could qualify to be part of a wider recurrent education system. With the exception of the French case, which could perhaps be considered as an approximation to an institutionalised global system of recurrent education, all the other examples are only partial measures analysed with a view to finding out whether they are equitable and efficient educational programmes which could be incorporated in a recurrent education system under given circumstances.

The first example qualifies under the adopted definition as a "recurrent programme" since its objective is to give additional training and education to persons who have had some kind of initial education and training long ago and who, after a period of employment, need a second chance to acquire

some further education and training. Although the training may be basic in character, its timing is scheduled later than in the conventional systems.

The second example does the same, but at a higher level of education.

The third and fourth examples describe education and training programmes for persons who have for one reason or other been outside the regular wage-earning labour force and who may or may not have held previous employment.

The fifth example seems interesting as it constitutes an attempt to introduce *by law* an institutionalised recurrent education system, as opposed to the more partial measures of the first four examples. Whether or not the French system will boil down to a nation-wide scheme of educational leave ¹—as some people forecast—remains to be seen, as the legislation was only adopted in 1971.

INTENSIVE PROGRAMME FOR THE PREPARATION OF INDUSTRIAL LABOUR

During or since the 1950s an increasing number of large training programmes have been launched and implemented in various countries with a view to preventing or eliminating bottlenecks due to the scarcity of adequately skilled manpower. From among these, the Brazilian Intensive Programme for the Preparation of Industrial Labour has been selected mainly because of its large scope, and the availability of data and of an evaluation. ²

Before the initiation of the Programme at the end of 1963 :

it was estimated that Brazil's annual need in terms of qualified manpower, based on a combination of a growth factor and a replacement factor for deaths, retirements and movement away from industry, was approximately 5,000 technicians and 60,000 skilled workers. In 1963, however, the graduate output of the technical and vocational schools stood at 1,000 technicians and 12,000 skilled workers—no more than one-fifth of the estimated needs. ³

To meet the urgent needs for skilled workers and technicians, a developing nation has two training alternatives. It can train its unskilled manpower for these highly skilled occupations, or it can upgrade and retrain its semi-skilled and skilled workers. The latter is not a long-range substitute for the former, but it is a much more rapid procedure—and this is the approach followed by the Intensive Programme. ⁴

¹ Paid educational leave is discussed in Chapter 6 as one means of financing a recurrent education system.

² The analysis of the Intensive Programme is based mainly on: "Evaluation of training in Brazil", *Training for Progress* (Geneva, ILO), Vol. 5, 1966, No. 4, pp. 1-48.

³ *ibid.*, p. 1.

⁴ *ibid.*, p. 35.

Some additional features of the Programme are : the informality of its organisational and administrative structure ; its utilisation of unused capacity and facilities at existing schools and training centres ; the close consultation and co-operation with industry, manpower organisations and training and educational institutions ; the ability shown in avoiding conflicts with the educational system ; the speed with which training agreements with industry and institutions were concluded and implemented ; a decentralised plan of operations which gives complete liberty of action to regional co-ordinators ; the freedom of choice allowed in teaching methods and techniques ; the way in which the Programme gained the confidence of the people and institutions involved ; and, finally, its flexibility.

The initial target set in late 1963 was to train, in 20 months, 46,185 persons for jobs at the skilled worker, foreman, junior technician and industrial technician levels as well as teaching staff. After this first period of operation it was decided to carry out an evaluation of the Programme.¹ This was based principally upon two sets of information : (a) cost data, and (b) the results of questionnaires used in personal interviews with workers, technicians and administrative staff, vocational teachers, drop-outs, supervisors in employment, programme teachers and instructors, directors and administrators of courses. In all 3,393 persons were interviewed.

Some of the results of the evaluation are of particular relevance for our purposes. As regards the *relationship between the courses taken and the trainees' occupations*, it was found that 62 per cent had been employed in the same occupation for which the course was given ; 20 per cent indicated that the subject-matter was completely different from their occupation ; 11 per cent said that the two were similar, and 6 per cent indicated they had been unemployed before the course. Of the *unemployed*, approximately 45 per cent found a job in less than one month ; approximately 20 per cent found a job in one to two months ; 20 per cent needed more than six months to find a job. As inflation and rather rapid changes in salaries make it difficult to compare earnings in Brazil over time it was decided to use the standard of "minimum salary" to estimate the *impact on earnings*. The results are shown in table 3.

When *rating the opinions* of course participants and their supervisors in employment, it was found that 93 per cent of the former considered the course to have been worth their while ; of the supervisors 83 per cent replied that the courses were good, while 15 per cent felt they were just average.

¹ The evaluation was carried out by Morris A. Horowitz and Manuel Zymelman of the Department of Economics, Northeastern University, Boston, under the auspices of the Brazilian Ministry of Education and the ILO's Inter-American Research and Documentation Centre on Vocational Training (CINTERFOR).

Table 3. Percentage distribution of earnings of respondents before taking course and at time of interview

Scale of earnings	Both areas		Semi-industrial area		Industrial area	
	Earnings before taking course %	Earnings at interview time %	Earnings before taking course %	Earnings at interview time %	Earnings before taking course %	Earnings at interview time %
Less than a minimum salary	12.9	7.0	17.0	9.9	11.5	6.1
1-2 minimum salaries	32.1	30.6	31.8	31.6	32.2	30.2
2-3 minimum salaries	18.4	20.6	15.8	20.4	19.4	20.6
3-4 minimum salaries	11.5	13.8	9.7	11.1	12.1	14.7
4-5 minimum salaries	7.9	8.7	5.7	6.5	8.6	9.5
More than 5 minimum salaries	9.9	15.5	7.9	12.0	10.6	16.6
No reply	7.3	3.8	12.0	8.5	5.7	2.2

Source : "Evaluation of training in Brazil", *Training for Progress* (Geneva, ILO), Vol. 5, 1966, No. 4, p. 18.

When asked to compare workers having gone through the Programme with those who had not, 52 per cent of the replies of the supervisors in employment were "more efficient", 29 per cent "equally efficient", and 3 per cent "less efficient".

The main aim in analysing the *cost* of the programme was to find out what happens to the cost of training a graduate when the programme is expanded or contracted, and how expensive it might become in the future, so as to compare it with other alternatives. When measuring the wastage resulting from *drop-outs* it was found that the largest percentage occurred in longer courses and in the public institutions, while the smallest percentage occurred in private industry and in courses of short duration.

It was concluded from the evaluation study that the Programme served a real purpose and was not in conflict with other vocational training programmes. It was recommended that it should be kept at least at its 1965 level, as this level was unlikely to increase the cost per graduate, while a reduction probably would do so. The Programme's flexibility and its ability to meet the changing manpower needs of industry were found to be largely due to its focus on upgrading and retraining. Since the evaluation, the Programme has not only continued on the same level of operation but has expanded its activities. Recent legislation¹, though maintaining the transitory character of the Programme, has extended its responsibility to training any manpower at the secondary level as opposed to industrial manpower only.

TRAINING OF VILLAGE-LEVEL WORKERS²

Given the priority of problems of employment, unemployment, and educational wastage and stagnation, there would seem to be, in general, little incentive for widespread use of schemes of recurrent education in the developmental context. However, this does not preclude the utilisation of special programmes of recurrent education at various levels to meet specific problems or bottlenecks in the development process. Such programmes may be efficient and/or equitable. They may be directed at improved health care, decreasing birth-rates through upgrading the skills of family planning personnel, training agriculturalists to meet the demands of rapid change in the sector, or retraining of industrial workers (as seen in the previous example). As shown in the present example, they can also be successfully directed to

¹ Decreto No. 70882 — de 27 de Julho de 1972. Dispõe sobre o Programa Intensivo de Preparação de Mão-de-Obra (PIPMO) e dá outras providências, *Diário Oficial* (Brasília), Vol. 110, No. 143, 28 July 1972, pp. 6705-6706.

² This section is based on: Richard L. Shortlidge, Jr.: "University training for gramsevakhs in India: An example of recurrent education in a low income country" (paper being prepared for publication).

higher levels of education, the main prerequisite for efficient and/or equitable schemes of recurrent education for developing countries being that they are primarily directed at correcting (a) short-run changes in the labour market requirements, and (b) the quality of public service personnel.

The gramsevak, or village-level worker, is the main formal channel of "developmental" communication between the Government and the village in India. With the emphasis on planned development in the early 1950s, the districts within each of India's states were subdivided into developmental "blocks" headed by a block development officer with a small clerical staff. The blocks were further subdivided into village groups. The gramsevak became the main extension link between the block office and the ten or so villages in his group.

With the expansion of agricultural technology in the mid-1960s in relation to the development of high-yield seed varieties, there was a corresponding increase in the qualifications required for the liaison role of the gramsevak. No longer was knowledge of existing practices and customs a sufficient condition for success ; he now needed to understand the complexities of hybrid seeds, pesticides, fertilisers and sophisticated water-control. In 1961, with the backing of the Government of India, G. B. Pant College of Agriculture and Technology initiated a special baccalaureate programme in agriculture for gramsevaks, covering two years instead of the normal three years required for a Bachelor of Science (Agriculture) degree. To qualify for admission, the gramsevaks had to have : (1) a pass in both the high school and the intermediate examinations ; (2) a pass in the two-year diploma course ; (3) five years of field experience or its equivalent.

These admission standards represented a lowering of the general academic requirements for the regular three-year programme. In lowering its admission standards and allowing a one-year reduction in the training programme, the university was substituting experience in extension work for formal education.

The results of the programme have been evaluated in terms of efficiency and equity, asking two questions : Have the resources invested in the special programme given as high a rate of return as those invested in the regular degree programme ? Has the gramsevak training programme been successful in extending higher education to a lower socio-economic group in India ?

Data on employment and earnings came from the respondents to a questionnaire mailed to all graduates from the university between 1963 and 1971. For each respondent, actual expenditures on tuition and fees, food, hostel and scholarships received were derived from official university student accounts. The official university expenditures for recurring and non-recurring budgets were also utilised to compute the social costs.

To determine the benefits from the programmes, age-specific earnings profiles were developed, using a single equation regression model.¹ The average age of gramsevak at graduation was 31, as compared to 21 for regular agricultural graduates.

The estimation of social costs involves measuring the value of total resources invested in the training of agricultural undergraduates at the university. These costs include (1) the annual recurring expenditure per student ; (2) the annual rent per student on the fixed capital investments ; (3) the student's expenditure on books and stationery ; (4) the net annual expenditure per student on food and lodging resulting from the decision to go to university ; and (5) the forgone productivity as measured by earnings sacrificed in exercising the option of going to university instead of entering the labour force.

In assessing costs per graduate, the probability of completing the degree is taken into account along with the probability of more than the specified time being required for it. Since the university engages in functions other than teaching, an estimate of the proportion of the university's facilities employed in teaching is needed. An estimate made in 1970-71 of the staff time devoted to teaching and related activities in the College of Agriculture gave the proportion as 29 per cent. With the growth in research and extension activities over the decade, it is assumed that this proportion was 80 per cent in 1960-61 when the university admitted its first students, and then declined linearly to the observed level in 1970-71. Depreciation of the fixed investment in buildings is estimated using a life expectancy of sixty years for such structures. Only annual depreciation is counted as cost.

Forgone earnings for the regular Bachelor of Science (Agriculture) graduate were based on the earnings of matriculates in the *Urban Income Survey 1960*.² Since the minimum qualification for admission to the university is intermediate, these earnings figures underestimate the earnings forgone by

¹ Monthly earnings are related to : (1) year of graduation ; (2) age at graduation ; (3) over-all grade point average for academic work completed at the university ; (4) the initial period of unemployment in months ; (5) number of jobs previously held ; (6) employment in Uttar Pradesh state ; and (7) months since graduation. To measure the impact of the category of employment, a series of dummy variables is also utilised ; these are used only in estimating earnings for graduates of the regular three-year programme since the overwhelming majority of gramsevak graduates are employed in state government service. The variables are : (1) employment in university research, extension and/or teaching ; (2) employment in Government of India sponsored corporations or research institutions ; (3) employment in state government ; and (4) employment in farming or private business. Very good fits were obtained in both equations, considering that individual observations were used. The R^2 for the gramsevak equation is 0.661 and for the regular three-year graduate 0.541.

² Mark Blaug, R. Layard and M. Woodhall : *The causes of graduate unemployment in India* (London, Allen Lane The Penguin Press, 1969), Table 7.1, p. 171.

graduates. To allow for this and for changes in earnings due to inflation, the earnings profile for matriculates in 1960 was adjusted to 1970-71 rupees using the "Consumer Price Index for Urban Non-Manual Employees", published by the Reserve Bank of India.

The earnings forgone by gramsevak are estimated directly from information provided on the questionnaire and by plotting the earnings of graduates who are not promoted from positions as gramsevak after leaving the university. This procedure allows the use of the full value of the differential in earnings as a measure of the benefit of investments in the gramsevak programme, since it is through promotion that advanced education becomes reflected in higher earnings. In the absence of similar longitudinal data for the regular agricultural graduate, it is assumed that only 60 per cent of the differential is the result of the investment in higher education.

Two relevant pairs of social rates of return are computed. The first assumes no delay in the promotion of gramsevak. The second assumes that the real measure of the social benefit from the investment in gramsevak is the earnings of the regular three-year agriculture graduate. The support for the latter assumption is threefold : first, the similarity in training programmes ; second, the significantly higher grade point average for gramsevak ; and third, the experience of gramsevak who elected not to return to their posts in state government service.

In the first case, the average social rate of return for gramsevak is 8.3 per cent, and for regular Bachelor of Science (Agriculture) graduates employed in government service 9.9 per cent. In the second case, the social return to gramsevak is 13.5 per cent. Given the similarity in training experience, the higher academic performance of gramsevak, and the ability of a few gramsevak to compete effectively in the same employment market, it is possible to claim that the programme is more efficient than the regular agriculture degree. If correct, this is attributable to the reduction of the training programme by one year. The analysis concludes that the special programme is at least as efficient as the regular undergraduate programme. The performance of gramsevak at university suggests, furthermore, the presence of complementarities between work experience and learning.

Among the regular undergraduates in agriculture who come from farming families the median landholding is 30 acres ; this places them in the top 1 per cent socio-economic group in rural India. On the other hand, the mean landholding for gramsevak is between 10 and 15 acres. Approximately 10 per cent of India's landholding families own between 10 and 15 acres. We conclude, therefore, that the gramsevak programme has allowed the participation in higher education of a lower socio-economic group although by no means the "poorest" in India.

RECURRENT EDUCATION FOR WOMEN

The first two examples of recurrent education and training programmes are, in principle, temporary in nature and will become superfluous as soon as the specific needs they were designed to meet are satisfied. Recurrent education for women, on the other hand, will have a permanent character as long as the tradition of a large proportion of women leaving the labour force for long periods of time is maintained. This section will not discuss the desirability of a change in this tradition, but will concentrate on three main points. First, the historical evolution of women's participation in the labour force. Second, the question of whether it would be efficient to postpone education and training for young women who will probably leave the labour force upon marriage. Third, recurrent education programmes which facilitate the re-entry of women into the labour force after long periods of absence from it.

Participation of women in the labour force is not a recent phenomenon associated with industrialisation or modern society.¹ Women have traditionally participated in the agricultural activities of pre-industrialised societies, either in the production of goods and services consumed by the household or in the production of goods and services marketed by the household. What is of fairly recent origin is the tremendous growth in the number of women in the labour forces of the developed countries of Europe, the Americas and Asia.

Historically, women played an important role in the development of the New England textile industries in the nineteenth century. Given the favourable land-labour ratio of the United States, the early industrialisation of New England was a function of child and woman labour.² Similar patterns of development in the industrialisation of Europe occurred even though the land-labour ratio did not favour it: women were traditionally a source of cheap labour and in many countries the early manufacturing industries relied on the skills developed by women in their household activities.³ Nevertheless, in contrast to the participation of men in paid work outside the household, the participation of women still represented a small proportion of the population of eligible women. Since the Second World War, both the United States and Europe have witnessed a tremendous expansion in the proportion of women working outside the home. Traditionally the increases have come from among women in the post-childbearing ages and the immediate post-

¹ Francine B. Weisskoff: " 'Women's place' in the labor market", *The American Economic Review* (Menasha, Wis., American Economic Association), Vol. LXII, No. 2, May 1972, p. 161-166.

² *ibid.*

³ Phyllis M. Deane: *The first industrial revolution* (London, Cambridge University Press, 1965).

educational or pre-marital years. Recently however there have been noticeable shifts in the participation of women in the childbearing ages, particularly among those with pre-school children, and since 1966 in the United States the largest proportional increase in the participation of women has occurred for this group. The increase in the participation of women has brought a marked increase in the number of families with more than one worker in the labour force. Corresponding to the increase in the participation of women has been an increase in the educational qualifications of women in the paid labour force. Another phenomenon of the last two decades has been the growth in the number of single-parent households headed by women.¹

Although changes in the pattern have been taking place in the developed countries, the employment of women outside the home is still predominantly in unskilled, clerical and white-collar work. In Eastern Europe, the participation of women has increased dramatically in the retail trades and in public service employment.² In Japan, the traditional role of women in agriculture has been reduced by the expansion of women's employment in the growing non-agricultural sector of factory and office work. The patterns of female employment in both these geographical areas resemble the one observed for Western Europe and United States in that participation of women is greater for unmarried women and women in the post-childbearing years.

In contrast with the developed countries, the participation of women in the developing countries remains minor and mainly restricted to agricultural and domestic tasks. In agriculture, the employment of women is generally confined to family-owned holdings and tends to be more seasonal than men's employment, being concentrated in the peak harvest and planting periods. The employment of women in most Moslem developing countries tends to be less than in non-Moslem countries, except in Turkey where a relatively large proportion of the women participate in the labour force, though outside the agricultural sector this is confined traditionally to certain industries. In India, women have traditionally been employed in the jute and textile industries ; in addition women often predominate in small craft operations which can be performed in the home, such as the making of local cigarettes.

The recent expansion of educational and health facilities in the developing countries has brought an increase in the demand for women in the labour force. The women employed in teaching and public health work tend to be

¹ Howard Hayghe : "Labor force activity of married women", *Monthly Labor Review* (Washington, DC, US Department of Labour), Vol. 96, No. 4, Apr. 1973, pp. 31-36 ; and Anne M. Young : "Children of working mothers", *ibid.*, pp. 37-40.

² Jerzy Berent : "Some demographic aspects of female employment in Eastern Europe and the USSR", *International Labour Review*, Vol. 101, No. 2, Feb. 1970, pp. 175-192 ; and Nabuko Takahashi : "Women's employment in Japan in a period of rapid technological change", *ibid.*, Vol. 98, No. 6, Dec. 1968, pp. 493-510.

predominantly from the more affluent families and the daughters of public service personnel.¹

The expansion of women in the labour forces of developed countries and developing countries raises questions about the validity of current educational systems to meet the requirements of women and those of the labour market. The differences in the nature of the employment of women between these two stages of economic development indicate the need to make a distinction in the policy recommendations for educational change.

The behaviour of the household resembles that of a firm engaged in the production of goods and services. The household is both a production unit and a consumption unit. It is engaged in the production of goods and services from which the household derives utility. The efficiency with which these goods and services are produced depends on the educational and socio-economic characteristics of the family.² There are, for instance, studies indicating a relationship between the education of women and the educational achievement of children: Shea and Wilken found that the education of mothers is an important determinant of whether children go to college or not.³ Women, therefore, in their work roles in the home perform important educational functions.⁴

The social costs of women's work outside the home are often difficult to assess, given the limited information on the sacrifice of household production involved. However, Levinson's study on working women in India indicates the possibility that major long-run social costs may result from the necessity for women to participate during the seasonal agricultural peaks; he finds, for example, that the incidence of infant mortality increases dramatically with the participation of women, particularly among the very poor in the labour force. Besides the loss of life (which includes both pecuniary and

¹ Fuad Baali: "Educational aspiration among college girls in Iraq", *Sociology and Social Research*, Vol. 51, No. 4, July 1967, pp. 485-493; Lee L. Bean: "Utilisation of human resources: The case of women in Pakistan", *International Labour Review*, Vol. 97, No. 4, Apr. 1968, pp. 391-410; D. R. Gadgil: *Women in the working force in India*, Kunda Datar Memorial Lectures, University of Delhi, 1964 (Delhi, Asia Publishing House, 1965); Labour Bureau, Ministry of Labour, Government of India: *Economic and social status of women workers in India*, Publication No. 15 (Delhi, Ministry of Labour, 1953); Padmini Sathianadhan Senguta: *Women workers of India* (Bombay, Asia Publishing House, 1960).

² Gary S. Becker: "A theory of the allocation of time", *The Economic Journal* (London, Macmillan; New York, St. Martin's Press), Vol. LXXV, No. 299, Sep. 1965, pp. 493-517; and Robert T. Michael: "Education in non-market production", *Journal of Political Economy*, Vol. 81, No. 2, Part I, Mar./Apr. 1973, pp. 306-329.

³ John R. Shea and Roger A. Wilken: *Determinants of educational attainment and retention in school* (Columbus, Ohio, Center for Human Resource Research, Ohio State University, Apr. 1972).

⁴ W. J. Swift and Burton A. Weisbrod: "On the monetary value of education's inter-generation effects", *Journal of Political Economy*, Vol. 73, No. 6, Dec. 1965, pp. 643-649.

psychic costs), there is a corresponding increase in morbidity with potentially serious effects on the productivity of the future labour supply.¹

Furthermore, the observed differential in earnings between men and women is a function of several factors which relate to differences in the career considerations facing males and females. The requirements of the home mean that women must give consideration to those careers (such as teaching or positions in a field such as public health) which are compatible with their household responsibilities. The need for flexibility in the scheduling of non-household work leads women to prefer employment in occupations with a high proportion of part-time employment.²

It is more realistic to think of the decisions as involving a dimension of time. In making a decision regarding an educational or occupational investment, women take into account the possibility of having to rely upon these investments to supplement family earnings at a time in the future (children reaching college age, death or illness of spouse, or a drop in socio-economic status). During the early childrearing years, the trade-off between non-household and household work may favour household work; but as children grow older the utility of additional earned income grows. The decision process can be seen as an intermittent one during the life-cycle of the individual.³

Much of the discussion concerning schemes of recurrent education for women has revolved around considerations of equity.⁴ In the present discussion emphasis will be placed on the efficiency of such investment.

A case cannot be made for a postponement of higher education or secondary education for women, since these obviously have social value as well as private value; general education in particular increases the efficiency of female labour in household production. A case can be made for a postponement of specialised training. Such training derives its primary stream of benefits from participation in the labour market. Therefore, from a social as well as a private point of view, it makes more sense to postpone this period

¹ Franklin J. Levinson: "An economic analysis of malnutrition among young children in rural India" (unpublished Ph.D. dissertation, Ithaca, NY, Cornell University, May 1972).

² Lack of part-time alternatives in a profession decreases the probability that a woman will choose it. See David C. E. Chew: "Wastage patterns in the nursing profession in Singapore: A study of manpower utilisation", *International Labour Review*, Vol. 100, No. 6, Dec. 1969, pp. 583-594.

³ Helena Znaniecki Lopata: "The life cycle of the social role of housewife", *Sociology and Social Research*, Vol. 51, No. 1, Oct. 1966, pp. 5-22.

⁴ Barbara R. Bergmann: "The economics of women's liberation", *Challenge*, Vol. 16, No. 2, May/June 1973, pp. 11-17; Gisela Schade: "Notes on recurrent education for women", *Higher Education* (Amsterdam, Elsevier), Vol. 1, No. 4, Nov. 1972, pp. 477-481; and Harriet Zellner: "Discrimination against women, occupational segregation, and the relative wage", *The American Economic Review*, Vol. LXII, No. 2, May 1972, pp. 157-160.

of training until entry into the labour force. However, the current system of timing educational investments forces women to undertake specialised training even if they intend to make use of it several years later. Uncertainty about future availability of educational alternatives makes it more rational for women to undertake their training at an earlier age, despite the risk of this training decreasing in market value over time (deterioration through non-use). The availability of specialised training at some future point in the life cycle of women will lessen the likelihood that they will invest in this training at an early age. By postponing costs (benefits are postponed by the decision to stay away from the labour force) the present value of the investment is increased, all else being equal.

Experience with the Open University in the United Kingdom and programmes of continuing education in the United States demonstrates the demand for recurrent education schemes by women. When the University of Pittsburgh initiated its programme of continuing education, it found that a high proportion of women who had failed to complete their baccalaureate degree returned.¹ The Open University in the United Kingdom attracts older women primarily in the post-childrearing ages. They tend to come from more affluent socio-economic groups.²

Yet despite the increasing number of education programmes for older workers, there is some reluctance on the part of women to participate in them. Generally, these programmes of continuing education offer a traditional form of higher education. Long absence from the learning environment and the predominance of young people in the educational system add uncertainty to women's decisions to return to school. Their preference for short training courses in vocational areas is a reflection of this uncertainty. Entering a regular academic institution involves not only a greater commitment of resources but also greater uncertainty regarding potential benefits.

Furthermore, admission standards in regular universities are geared to young people fresh from secondary school. The requirement of a secondary school transcript or letters of reference from high-school teachers is absurd for women in their thirties. In addition, emphasis on scores in scholastic attainment tests increases the risk that they will fail to meet the academic admission requirements. Their performance in the home, their experience in the community and their activities related to their husbands' career are not usually taken into account for admission to a regular four-year institution.

¹ Caryl M. Kline : "Educational planning for mature women", paper presented at the OECD Recurrent Education Conference, Washington, DC, 18-21 March 1973.

² Leslie Wagner : "The economics of the Open University", *Higher Education*, Vol. 1, No. 2, May 1972, pp. 159-183.

Short-cycle educational schemes, such as the community colleges in the United States, generally cater to women and disadvantaged groups. Unfortunately these institutions face problems of staff recruitment and of status in the community. A scheme of recurrent education must provide training for those women who wish to enter the labour force after completion of the course programme. The tendency now is to see short educational programmes as a stepping-stone to a four-year institution, and to structure curricula accordingly.¹

While the requirements of developed economies are for recurrent education to increase the competency of the labour force and to meet the increasing needs of women to participate in the labour force, those of developing countries are different. The primary function of the majority of women in these countries lies still in household activities. Furthermore, the fact that in developing countries there are not even sufficient employment opportunities for men (who are traditionally preferred for most jobs to women) gives women little incentive to acquire job-oriented training and education (outside traditionally female occupations), let alone recurrent education and training. From a purely economic point of view it would be more efficient for programmes of recurrent education to aim mainly at providing specialised training for those groups who serve the majority of women who remain in the home : the training of teachers, public health personnel, and family planning personnel. In this situation, it will remain an open question how developing countries will reconcile the basic right of non-discrimination in education and employment with efficient education and recurrent education programmes for women.

RECURRENT EDUCATION FOR EX-SERVICEMEN

Long before the Second World War drew to a close, several nations sought to develop comprehensive national plans for the reintegration of the discharged soldier into the civilian labour force. Such schemes had a multiple rationale. First, they could meet the training needs of the individual and the manpower needs of the labour market. Second, they would soften the impact of the sudden influx of former servicemen on the labour supply. Third, they could compensate the serviceman whose education or career had suffered a lengthy wartime interruption.²

¹ Dorothea Furth : "Issues in short-cycle higher education", *Higher Education*, Vol. 2, No. 1, Feb. 1973, pp. 95-102.

² A series of articles in the *International Labour Review* described such programmes in a number of countries : "Demobilisation and re-employment of ex-service personnel in South Africa", *International Labour Review*, Vol. LII, No. 5, Nov. 1945, pp. 525-527 ;

In a few countries, these "rehabilitation" or "resettlement" programmes took the form of mammoth recurrent education programmes. We shall attempt first to describe and then to analyse those aspects of post-war ex-servicemen's training in the United States and the United Kingdom which may have general applicability for other programmes of recurrent education.

In the United States, the bulk of the educational benefits awarded to veterans¹ were administered under Public Law 346—the Serviceman's Adjustment Act of 1944 (the so-called GI Bill of Rights). Anyone who had served a minimum of 90 days in the military between 16 September 1940 and 26 July 1947 (having other than a dishonourable discharge) was entitled to these benefits, which covered most of the cost of attendance at any approved institution.² While returning to high school did not qualify a veteran for GI benefits, a variety of non-collegiate (agricultural training, business school) programmes were approved. In addition to aid for explicitly educational purposes, the programme also provided other benefits which greatly reduced the financial burden of participation in education.³

In the United Kingdom a similar programme, the Further Education and Training Scheme (FETS), was developed by 1943 and went into effect at the end of the war. Like its American cousin, the scheme included benefits also for those engaged in training activities other than traditional university education. The British programme differed from the American in that its coverage was considerably broader—including "everybody who had done work of national importance"⁴—and in that it required payments by the parents of aid recipients who were under 21.⁵ These parents' payments were suspended as soon as the recipient attained majority.

Before the start of the ex-servicemen's benefit programmes, there was widespread concern (at least in the United States) that they would be detri-

"Education and vocational training for war veterans in the United States", *ibid.*, Vol. XLVIII, No. 6, Dec. 1943, pp. 773-774; "Post-war educational facilities for demobilised persons in Great Britain", *ibid.*, Vol. XLVII, No. 6, June 1943, p. 777; "Post-war training needs in Canada", *ibid.*, Vol. XLIX, No. 6, June 1944, pp. 665-666; "Reconstruction training in Australia", *ibid.*, Vol. LVI, No. 3, Sep. 1947, p. 325; "The rehabilitation of discharged service personnel in New Zealand", *ibid.*, Vol. XLIX, No. 2, Feb. 1944, pp. 197-205; "Resettlement of ex-servicemen in India", *ibid.*, Vol. L, No. 3, Sep. 1944, pp. 370-372.

¹ In US usage ex-servicemen are referred to as "veterans".

² Donald E. Johnson: "A quarter century of the GI Bill", *School and Society* (New York, Society for the Advancement of Education), Vol. 98, Apr. 1970, pp. 226-228.

³ Wilbur J. Cohen: "The Federal Government's program for ex-servicemen", *Annals of the American Academy of Political and Social Science* (Philadelphia), No. 238, Mar. 1945, pp. 63-70.

⁴ H. and M. H. Peston: "The Further Education and Training Scheme", paper presented at the OECD Recurrent Education Conference, Washington, DC, 18-21 March 1973, p. 3.

⁵ *ibid.*, p. 10.

mental to higher education. The result, it was feared, would be to turn the university experience into "a form of cheapened impractical vocational experience".¹ This, however, proved not to be the case, and a study found no significant difference in academic performance between ex-service and other college students in 1950.² In Great Britain, an unusually large percentage of FETS beneficiaries completed their programmes of study successfully, there being only about a 20 per cent "wastage rate".³ In some subject areas as many as 91 per cent of the FETS trainees completed their courses of study (civil service and teaching) while in others (e.g. architecture and chemistry) wastage rates were considerably above the over-all rate.

Before proceeding further, it is of interest to know how many students were involved in these programmes, and in what fields of study. In the United States, 7.8 million veterans took advantage of GI Bill benefits (at a cost of \$14,500 million or just under \$2,000 per trainee).⁴ Of these, 2.23 million attended approved colleges and universities. In 1947, fully 70 per cent of all male college students were receiving GI benefits.⁵ It is estimated that 50 per cent of all Second World War veterans in the United States received such benefits. A partial breakdown of fields of study is reproduced below (it includes some trainees other than those attending colleges and universities) :

Field of study	Number participating
Trade or industry	2 600 000
Commerce or business	1 375 000
Engineering	450 000
Education	238 000
Life sciences	90 000
Physical sciences	85 000
Medicine	66 000
Dentistry	22 000

Source : Johnson, op. cit., pp. 226-228.

¹ "Education of veterans under Public Law 346", *Journal of Criminal Law* (Baltimore, Williams & Wilkins), Vol. 36, May 1945, p. 40.

² Donald D. Stewart and Richard P. Chambers : "The status background of the veteran college student", *Sociology and Social Research*, Vol. 35, No. 1, Sep./Oct. 1950, p. 21.

³ Peston and Peston, op. cit., p. 6.

⁴ Johnson, op. cit., p. 227.

⁵ *ibid.*

The FETS in the United Kingdom had fewer participants than did the American scheme—only 86,425 participants at all levels of training.¹ A breakdown of the aid recipients by intended occupation is reproduced below (the British scheme included more women than the American, but women constituted only 7 per cent of FETS recipients)² :

Occupational area	Percentage	
	Men	Women
Architecture	6.0	2.1
Art	4.5	13.4
Chemistry	3.0	0.7
Civil service	5.8	3.0
Commerce	3.1	14.2
Dentistry	1.6	0.3
Engineering	14.6	0.0
Law	2.9	0.4
Medicine	6.3	3.2
Music and drama	2.3	10.0
Pharmacy	1.4	0.3
Religion	5.9	0.0
Teaching	27.3	23.5
Social work	1.0	9.6
Unclassified	14.3	19.3

Source : Peston and Peston, op. cit., p. 4.

At this point, attention should be drawn to the longer-term effects of these recurrent education programmes on the stocks of human capital in the United States and the United Kingdom and on the income levels of the participants. Clearly, in both countries, ex-servicemen's benefits enabled some students to begin and/or complete their education who otherwise would not have been able to do so. Hence, the over-all level of human capital accumulation in both countries was greatly improved. It has been calculated that 12.5 per cent of all male college graduates between 1940 and 1955 would not have attended college at all without GI benefits.³ Another study is somewhat more impressionistic, but the conclusions are the same.⁴

¹ Peston and Peston, op. cit., p. 3.

² *ibid.*, p. 3.

³ Charles B. Nam : "Impact of the 'GI Bills' on the educational level of the population", *Social Forces* (Chapel Hill, NC, University of North Carolina Press), Vol. 43, Oct. 1964, p. 30.

⁴ Peston and Peston, op. cit.

Veterans in the United States have had higher median years of schooling than non-veterans.¹ There is also evidence to indicate that, at any educational level, veterans who were of the prime age to take advantage of GI benefits have had higher median incomes than non-veterans.²

The success of the ex-servicemen's education programmes is, of course, due in part to the characteristics of the men themselves. In the United Kingdom benefits could be received only after admission to an educational institution—a fairly effective screening device.³ In the United States where advanced education was more readily available, Stewart and Chambers found that veterans tended to come from lower socio-economic status groups than did their non-veteran collegiate colleagues, but that both groups were of higher-status background than the mean of the population as a whole.⁴ The armed services of both countries maintained some minimum requirements of intellectual capacity, so that those who were eligible for these benefits had been screened to some extent. Indeed, those most likely to participate in post-war training were those who had been participating in some form of educational activity prior to the war.⁵

Ex-servicemen's education programmes must face several problems, some of which were analysed during the post-war period. To be successful, any such programme must recognise that those participating are unlike students of 18-24 years of age who have had an uninterrupted school life. They want educational experiences which are more job-oriented.⁶ A quick examination of the subject choices of American veterans and of the firm occupational goals of British ex-servicemen substantiates this notion.

They must also adjust to the campus environment—one quite foreign to a man more accustomed to the barracks or the foxhole.⁷ To take advantage

¹ See "Educational attainment of civilian male non-institutional war veterans, post-Korean conflict veterans, and non-veterans in the US, March 1967, related to income in 1966", United States Veterans Administration, Research Note 042A1-600 (mimeographed, 1968).

² *ibid.*

³ Peston and Peston, *op. cit.*, p. 3.

⁴ Stewart and Chambers, *op. cit.*

⁵ Nam, *op. cit.*, p. 30.

⁶ Ivan Gustafson: "Educator's idealism vs. veteran's realism", *Education* (Milwaukee, Wis.), Vol. 67, Sep. 1946, pp. 55-56.

⁷ See Rosalind Loring and Edward Anderson: "The considerations in planning and administering a college prep program for veterans", *Adult Leadership* (Washington, DC), Vol. 20, Sep. 1971, pp. 100-102 and 110-112; Edward C. McDonagh: "Adjustment problems and characteristics of university veterans", *Sociology and Social Research*, Vol. 31, No. 2, Jan./Feb. 1947, pp. 220-225; Harry Estill Moore: "Campus adjustment of veterans", *ibid.*, Vol. 32, No. 2, Jan./Feb. 1948, pp. 711-717; and William W. Wattenberg: "Separate schools for veterans?", *Educational Forum* (Columbus, Ohio), Vol. 10, Mar. 1946, pp. 359-362.

of the ex-servicemen's increased motivation and to help them in their adjustment, some institutions developed separate programmes for them.¹

Loring and Anderson list ten characteristics of veterans which should be remembered in designing any recurrent education programme to meet their needs: (a) high motivation; (b) anxiety at being above average age; (c) desire to be respected for service experience; (d) low academic self-concept; (e) diversity of verbal skill levels; (f) ambivalence toward authority; (g) accustomed to discipline; (h) lack of career plans; (i) dissatisfaction with "the establishment"; (j) need for considerable readjustment.² To deal with some of these factors (especially items (h) and (j)) counselling has long been recognised as an integral part of any effective veterans' education programme.³

While the post-Second World War programmes are perhaps the best known, in the United States veterans' educational benefits have become a permanent fixture of the educational system. New social situations, however, place new demands on these recurrent education schemes. Fendrich, for example, points out that the Black veteran from Viet-Nam is torn between the United States' two great traumas: the war itself and racial tension. Any veterans' benefit scheme must take account of these new specific needs of the Black veteran.⁴

To sum up, educational programmes for ex-servicemen in the United States and the United Kingdom have succeeded because (a) direct money costs to the individual and (in the face of post-war unemployment) opportunity costs have been minimised; (b) economies of scale have been achieved; (c) rather than placing the ex-serviceman in unmodified, traditional educational situations, specific recognition has been given to his "separateness" as described above.

The success of these educational programmes and the experience accumulated in their planning and implementation have had a positive impact on the development of recurrent education in general. As these programmes have been the forerunners of large recurrent education programmes, their outcome was bound to influence further action in that field. Their success

¹ See, for example, Roger Williams: "Veterans... A subtle difference", *Alcalde*, The University of Texas at Austin Alumni Magazine (Austin, Tex.), Vol. LXI, Mar. 1973, pp. 24-25.

² Loring and Anderson, *op. cit.*

³ W. Leslie Barnette, Jr.: "Report of a follow-up of counseled veterans: II. Status in pursuit of training", *Journal of Social Psychology*, Vol. 32, Nov. 1950, pp. 143-156 (part of a series of articles on counselling for veterans).

⁴ James M. Fendrich: "The returning Black Vietnam-era veteran", *Social Service Review* (Chicago, University of Chicago Press), Vol. 46, Mar. 1972, pp. 60-75.

has encouraged educational authorities, and also employers and potential students, to embark upon similar programmes for different groups of the population and at various educational levels.

A GLOBAL SYSTEM OF RECURRENT EDUCATION AND TRAINING

The examples discussed up to now are programmes which are only a fraction of the global education system, into which they are not even always properly integrated. They were designed for coping with precise and limited education and training needs which the regular system could not satisfy.

Having seen how these partial measures have been put into practice, we can now usefully consider a more global approach to recurrent education and training. To our knowledge, the only example of an attempt to introduce explicitly and institutionalise recurrent education at the national level as a system is the 1971 legislation adopted in France.¹ A series of previous measures had prepared the way. Two Acts, passed in 1966² and 1968³ respectively, had represented a first cautious step towards recurrent education and provided the basic financial regulations for establishing the right of each worker to the recurrent training.⁴ The national inter-industry agreement on initial and further training made in 1970 between French employers and workers' organisations, which among other things recognised workers' rights to educational leave, was a further step towards a system of recurrent education and training.⁵ In the preparatory work for the Sixth National Development Plan it was estimated that training would be needed for 600,000 persons each year: initial training for 200,000 young persons; upgrading training for 200,000; retraining of 100,000 for the same or another kind of work; training for 100,000 in new techniques.⁶ One of the recommendations of the Plan

¹ Act No. 71-575, to organise continuing vocational training as part of lifelong education. Dated 16 July 1971 (*Journal officiel de la République française*, 17 July 1971, No. 164, p. 7035). English translation issued in ILO: *Legislative Series*, 1971-Fr. 1.

² Act No. 66-892, to lay down a vocational training policy and programme. Dated 3 Dec. 1966 (*Journal officiel*, 4 Dec. 1966, No. 279, p. 10611). English translation issued in ILO: *Legislative Series*, 1966-Fr. 2.

³ Act No. 68-1249, respecting the remuneration of vocational trainees. Dated 31 Dec. 1968 (*Journal officiel*, 2 Jan. 1969, No. 2, p. 74).

⁴ Charles Moulin: "La formation permanente et la loi", *Informations sociales* (Paris), No. 10, Dec. 1971, pp. 30-45.

⁵ "Formation et perfectionnement professionnels: accord national interprofessionnel du 19 juillet 1970", in *Liaisons sociales* (Paris), Collection législation sociale, No. 3651 (supplement to No. 5878): Conventions collectives et accords, pp. 1-10.

⁶ "Rapport sur les principales options qui commandent la préparation du VI^e Plan" (Paris, Commissariat général du Plan d'équipement et de la productivité, 1970).

for meeting these needs was that public educational establishments should make large-scale provision for lifelong education and training, according to a coherent plan. The 1971 Act supplements the previous measures, sets out a coherent framework for recurrent education and training and contains provisions for the financing of the new policy.

The policy is defined as follows :

Permanent vocational training constitutes a national duty. It shall comprise initial training followed by subsequent periods of training provided for adults and young persons already engaged in active life or entering such activity. The subsequent training periods constitute the continuing vocational training.

Continuing vocational training shall form part of permanent education. Its object shall be to enable workers to adapt to changing techniques and conditions of work and to promote their improved industrial proficiency through incentives and further training by gaining access to other levels of culture and occupational skills and their contribution to cultural, economic and social progress.

The State, local bodies, public establishments, public and private educational establishments, associations, occupational, trade union and family organisations and undertakings shall collaborate in providing such recurrent vocational training.¹

After laying down the administrative structure for this policy, the Act deals in some detail with the financial means and implications: training leave, financial assistance by the State, employers' participation in financing continuing occupational training, financial assistance to vocational trainees, and provisions respecting training of central and local government employees.

Leave of absence up to a maximum of one year will be granted to employees with two years' service or more in the enterprise who wish to follow an approved training programme, other than those who have held a full-length higher or equivalent certificate for less than three years. The number of persons entitled to training leave at any one time will vary according to the size of the undertaking.

State aid will be granted for the following types of training : retraining for a different type of employment ; adaptation or additional training for facilitating entry into first or new employment ; occupational upgrading ; updating or refresher training ; pre-vocational training, initial training, specialisation or other training for entry into employment.

Employers with more than ten employees will participate in financing the above types of training by a contribution equal to at least 0.8 per cent of their total annual payroll. This rate will rise progressively to 2 per cent by 1976.

The amount of *financial assistance to trainees* is calculated depending on the type of training.

¹ *Legislative Series*, 1971-Fr. 1 (art. 1 of the Act).

The economics of recurrent education and training

It would seem that the Act has sufficient built-in “safety factors” to avoid too much training for jobs with few occupational opportunities, to encourage training in occupations with large numbers of openings, to prevent or (if necessary) overcome obsolescence, to facilitate training for those who need it most, to assure the necessary financial resources and to provide the required administrative infrastructure.

However, the system has not as yet been operating long enough for us to be able to draw conclusions regarding its efficiency (or equity).

Although financial considerations have been postponed to almost the end of this study, they are far from unimportant. In fact, how the cost of recurrent education is to be shared between students (workers), employers and taxpayers is a central issue because it largely determines who will be educated and trained and in what fashion. Such financial considerations are rather complex.

They are complex, firstly, because the cost of any education and training activity has many components and some of these are difficult to determine. Some of the more important components of the total cost are the earnings forgone by students, the facilities used, expenses on programme design, training or retraining of teachers, administration, and teaching staff salaries. The issue is further complicated where training takes place wholly or partly in connection with production in an enterprise : the time devoted to teaching by experienced workers and instructors having production and teaching functions is difficult to assess, and wastage and reduced production caused by trainees are difficult to deduct from productive work carried out by trainees.

A further complicating factor is that the same type of educational programme may cost different amounts to investors depending on where and how it is implemented. This can be exemplified by comparing the sharing of cost in a vocational training programme given in a government school and one given in an enterprise. In the first case the largest share of the cost will be borne by the taxpayer. In some countries where enterprises are under a legal obligation to pay a special tax amounting to a varying percentage of their payrolls for training and education purposes, these tax receipts may be used for running public training programmes. In the second case, where training is given in the enterprise, a large share in the cost is borne by the enterprise. To some extent the trainee will contribute to the cost by carrying out productive work (how much productive work he or she will be able to

produce largely depends on the trade being learned) and by forgoing wages obtainable elsewhere.

Again, enterprises in some countries can deduct the cost of their training activities from their taxes, or can obtain partial or total exemption from the training tax or levy. The exact percentage contribution of the three investors in the total cost is thus difficult to determine. Furthermore, education and training, and recurrent education and training in particular, are areas in which the market does not perform its functions as described in standard textbooks. If it were performing them (i.e. if it were allocating resources to their optimal use), there would be no need for cost-benefit analyses either in the narrow or in the wide sense. But there are a number of barriers to such an outcome.

BARRIERS TO APPROPRIATE INCENTIVES

The incentives to investors—whether workers (students) or employers—in recurrent education are not what they should be for three main reasons :

- (1) income distribution preferences cannot be accommodated by the market ;
- (2) market imperfections create barriers to the formation of incentives ; and
- (3) certain properties of the good itself (recurrent education) make it impossible for the market to work as desired, even without reference to the first two reasons.

1. Income distribution preferences

The market allocation mechanism can be considered equitable only on the assumption that the desired income distribution has already been achieved. If it has not been achieved, purchasing power is not optimally distributed, and the demand for recurrent education and training on the part of individuals reflects this maldistribution. The result is a distribution of education and training that does not optimise the welfare of a society.

Furthermore, private investment decisions may be leading to an increasing spread in the distribution of human skills. This spread will produce an income distribution which may be undesirable, and which society will undertake to modify. As pointed out earlier, modification can proceed basically in two ways : either through transfer payments or through government subsidies in the acquisition of skills. The second public policy may be the more advantageous for a number of inter-related reasons. Human skills need to be developed only once to alter the distribution of income in the future, while transfer payments must be made every year for the same result to occur.

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Furthermore, additions to the supply of human skills can lead to economic growth and, if bottlenecks exist, may make short-term economic stabilisation easier. In short the policy may be cheaper. But even if it is not cheaper it may be a desirable instrument to use. As indicated earlier and again later in this chapter, additions to skills often create complementary psychic returns : for example, training may lead to jobs with better working conditions, and may increase the job satisfaction and self-respect of the worker. What may be a somewhat inefficient investment may turn out to be a very desirable investment from the point of view of society when the consumption “advantages” are added to the purely monetary “advantages”.

To summarise, for reasons of income distribution, public policy in the field of recurrent education and training is necessary. There is no alternative to it, because there is no way in which markets can be changed or structured to take account of income distribution preferences.

2. Market imperfections

Two types of market imperfection are of particular importance to the private investment decision in recurrent education : those relating to the capital market and those relating to market information.

There is a particular sort of imperfection in the capital market which is an important reason for the insufficiency of demand for education and training. As Friedman has pointed out :

Investment in human beings cannot be financed on the same terms or with the same ease as investment in physical capital. It is easy to see why. If a fixed money loan is made to finance investment in physical capital, the lender can get some security for his loan in the form of a mortgage or residual claim to the physical asset itself, and he can count on realising at least part of his investment in case of default by selling the physical asset. If he makes a comparable loan to increase the earning power of a human being, he clearly cannot get any comparable security. In a non-slave State, the individual embodying the investment cannot be bought and sold . . . A loan to finance the training of an individual who has no security to offer other than his future earnings is therefore a much less attractive proposition than a loan to finance the erection of a building : the security is less, and the cost of subsequent collection of interest and principal is very much greater.¹

For that reason private investments in skills are essentially limited to the individual's and parents' current income. The process faced by the less fortunate can be described as a vicious circle. They are poor partly because they have few skills. With few skills they earn little and therefore are limited

¹ Milton Friedman : *Capitalism and freedom* (University of Chicago Press, 1962), p. 102.

in their investments in skills. Low incomes lead also to high "time preferences" (short time spans) so that investments appear less profitable. Thus, the least amount of skill acquisition occurs in those groups that need the most if the income distribution gap is to be narrowed. Clearly the process is both inefficient and inequitable.

There is room for considerable improvement in the capital markets serving potential investors in skills in all countries. Several developed countries have accumulated considerable experience with different approaches in providing loans to students. By themselves, such loans may not be sufficient. Where income distribution effects are considerable, subsidies may be also necessary. But a good system of loans and incentives for investment in skills goes a long way to break up the vicious circle described above. One advantage of recurrent education and training that should be mentioned in this context is that it offers the possibility of investing relatively small amounts several times over a long period, instead of investing a large amount at one single point in time.

A related factor in this capital market imperfection is the differential treatment of human capital under most tax systems. Both human and physical capital are subject to depreciation and obsolescence. All the tax systems familiar to us recognise these effects and allow write-offs for physical capital, but they do not do this for skills. It is true that the earnings forgone are not taxed, but all the direct expenditure for education and training is not treated as capital in the tax laws. The fact that educational capital involves maintenance and depreciation, becomes obsolete and disappears with death is ignored by these laws. Certainly, a more equal treatment of these two types of capital would enhance investments in skills.

We turn now to the second type of imperfection, which is the market information problem. Investments in education and training have to be made in the face of considerable ignorance. A young individual has only an imperfect idea of the extent of his natural abilities, talents and knowledge. His knowledge of the cost of acquiring skills, and of the probable returns associated with these skills, may be even vaguer. Since training on or away from the job is complementary to education, some notion of how much training one is going to get is required for a rational decision. As we enumerate all these gaps in knowledge it becomes clear that the risks and uncertainties are considerable. These are bound to diminish the eagerness of prospective investors to invest in certain types of skill, and the likely result is a certain amount of underinvestment. Furthermore, as Schultz has pointed out :

Much worse still is the lack of information on the differences in the quality of the educational services of different colleges and universities. Nowhere are students confronted by prices for these services that are equal to the real cost of producing

them, and therefore the prices to which they respond are not efficient prices. As a consequence, no matter how efficient students are privately in their decisions, from the point of view of the economy as a whole, the allocation of resources to . . . education will not be efficient.¹

We can summarise this brief discussion by saying that prospective investors in skills must have information on all aspects of what they are buying, in order to make rational choices. There is a great deal of relevant information that governments, educational institutions and employers can furnish so as to reduce this type of imperfection.

3. Properties of recurrent education

Even if income distribution were ideal and there were no market imperfections of the type just discussed, there are two properties of "education and training" as a commodity which make it most unlikely that the proper incentives will be present in prospective investors in that good. These are the externalities associated with education and training, and psychic returns.

Externalities are advantages or disadvantages that accrue to individuals other than the investor. These effects cannot be appropriated by him, and he cannot charge the beneficiaries for their use. Therefore these externalities—mostly positive in the present case and therefore "advantages"—are of no interest to the investor, and are mostly ignored in making the decision to undergo education and training. But they are a benefit to the community which might wish to obtain them. From this point of view, therefore, individuals by themselves will tend to invest too little in themselves.

An extensive discussion of possible externalities can be found in a study by Weisbrod², in which he attempts to give a monetary value to some of these. But it remains generally true that we really know very little about their extent at different levels of education and training. There is general agreement that externalities of primary-school education are important and obvious. Literacy and numeracy appear essential to the working of any developed economy. The social benefits of such education are enormous and cannot be appropriated by the individual in the form of higher earnings. The externalities of secondary education are less obvious. The externalities of higher education are still more difficult to identify. Finally, it is agreed³ that externalities in vocational training are minimal, if any.

¹ Theodore W. Schultz : "Resources for higher education : An economist's view", *Journal of Political Economy*, Vol. 76, No. 3, May/June 1968, p. 342.

² Burton A. Weisbrod : *External benefits of public education : An economic analysis* (Princeton, NJ, Princeton University Press, 1964).

³ Sherwin Rosen : "Externalities and manpower programs", paper presented at the Conference on Evaluation of the Impact of Manpower Programs, Columbus, Ohio, 15-17 June 1971.

The effects of psychic returns were briefly discussed in a previous chapter. The existence of these psychic benefits (also called "consumption benefits") in the production and employment of skills complicates the matter of incentives. Suffice it to recall that, in general, psychic benefits reduce incentives, especially among the poor, to invest in the acquisition of skills. The extent of this reduction remains uncharted territory.

This brings us to the following general remark. We know pretty well the reasons why the proper incentives for skill formation do not arise automatically in an economy. Certainly some of the barriers mentioned can be reduced, particularly the market imperfections, but they cannot be eliminated completely. As regards the other "barriers", one can say that no direct policy can eliminate them. And not knowing much about the extent of their effect, it is difficult to prescribe the size of the indirect policy that should be undertaken. What is a policy maker in this field to do?

The answer is easy in principle. A start can be made by evaluating a recurrent education or training programme in terms of efficiency and equity in the broadest sense, including dynamic efficiency in relation to economic growth and the reduction of structural unemployment. Having compared a number of programmes in these terms, it is possible to choose the set (or single programme) that can be accommodated within the budget available for recurrent education and training. The budget available is itself a possible variable. In that case the comparison is between sets of recurrent education and training programmes and other educational and training activities. Once a decision is reached, it is necessary to implement it by creating sufficient incentives to students (workers) and employers so that the programmes can be carried out to the full extent planned. It is this process of incentives creation through a number of possible policy tools—subsidies of any type, taxes and other more direct constraints—that is the central issue in the financing of recurrent education. The process consists of evaluating the private rates of returns to the participants in the investment under different assumed policies (policy tools of the type mentioned) and choosing the set that leads to the desired action.

The process is easy to formalise but very difficult to put into actual practice. Given the present state of the art of planning, and the present state of knowledge of possible interdependencies both in the production of skills and in their subsequent use, it is no wonder that educational planners are unable to follow the process of planning step by step. Short cuts have to be taken, reliance is put on intuitive reasoning, and in general the planner does his best given the circumstances. But it is important that he continually keep in mind the process that ideally should be followed, so that he will not fall into the

numerous intellectual traps into which many educational planners very often do fall.

To summarise, it can be said that any investment in education and training, recurrent or not, is a shared investment (between taxpayers, students and employers). The motivation for undertaking a given programme may vary from one investor to the other. It is important to find out, at the planning stage, which investment is the most profitable from the point of view of all three investors and to provide the necessary information and create the right incentives.

In the remaining portion of this chapter we shall look at some suggested financial tools in the field of recurrent education. They will be examined mainly from the point of view of whether they are efficient tools in reaching desired outcomes.

FINANCIAL TOOLS IN RECURRENT EDUCATION AND TRAINING

A very important example of how the wrong use of financial tools can have serious consequences is the case of graduate unemployment in a number of developing countries. As already suggested, considerations of social profitability of education differ substantially from those underlying private profitability. Confusion of this distinction has been a source of the trouble in the field of higher education. For the motivation of students, the rate of return from a private point of view is relevant. In India, for example, the private rates of return are considerably higher than the social rates.¹ Similar conclusions hold for a number of other countries.² The private rates of return are a measure of the incentives to acquire a higher degree, while the social rate of return is a measure of the desirability from the point of view of society for individuals to acquire such degrees. The private rates of return tend to be higher than the social rates where the students bear only a small part of the cost of education and governments subsidise education heavily. The vast demand for higher education in spite of its social unprofitability springs partly from this misuse of financial tools, which leads to a lack of balance between private and public rates of return.

Has this example anything to do with recurrent education and training? The answer is that it has. A number of proposals for financing recurrent education and training systems appear not to be aware of the possible con-

¹ Blaug, Layard and Woodhall, op. cit.

² G. Psacharopoulos: *The economic returns to education in the process of development: An international comparison* (Amsterdam, Elsevier Scientific Publishing Co., 1972).

sequences of heavy subsidisation. One such proposal deserves notice because of the extreme position it takes. Starting with the proposition that "the major problem of dealing with the unemployed, whether they be skilled individuals or the so-called hard-core unemployed, is the lack throughout the last decade of an all-out effort to deal with the problem of employment or employability"¹, Striner proceeds to attribute it to a series of dramatic changes, including a dramatic change in longevity since the 1940s and "an equally dramatic increase, from all indicators available to us, in the rate of technological change, causing skills to obsolesce more rapidly than they did in earlier years".² In this situation, he argues, "it becomes rather obvious that unless there is a major change in our educational and training systems, people may live longer but will be plagued by frustration and anxiety".² The major change proposed is the development of a continuing education system throughout the life of the individual. Financed how?

... in our inevitable move toward a lifetime continuing education programme, there is the necessity for complete subsidisation of the programme, *including economic support to workers and their families* so that they may live according to conditions associated with their normal economic situation, even while in education and training programmes . . . Not to provide this income subsidy . . . will incur a loss in national income, productivity, and tax income which is greater than the amount of national investment for an effective training and education programme. Unless we move in the direction of an all-out and massively subsidised continuing education programme for adults throughout their lifetimes, our economy will continue to be one which is high cost, economically inefficient, and frustrating to the large numbers of workers who do not possess the economic means to acquire the necessary training and education to keep pace with the changing complexities and technical skill needs of the society of which they are a part. The economic consequences of this projection might well pale in significance when compared to the political implications for this nation.³

The extreme nature of this proposal derives from the fact that the propositions on which it depends are not defended on factual grounds. No initial or tentative evaluation of the programme on efficiency and equity grounds is given. Incentives are built into the system which may have disastrous consequences. The outcome may well be an over-qualified labour force, unhappy and bored because they cannot use their qualifications, more highly unemployed because of higher aspirations and pretensions and, finally, paying higher prices for the goods they produce because, in the last analysis, someone has to pay for their lifelong education and training.

¹ Herbert E. Striner: *Continuing education as a national capital investment* (Kalamazoo, Mich., and Washington, DC, The Upjohn Institute, 1972), p. 1.

² *ibid.*, p. 5. Needless to say, none of these propositions is supported, and none can well be supported.

³ *ibid.*, pp. 9-10 (author's italics).

This is not a necessary consequence of the proposal, but it *may* be a consequence. The point is that without having evaluated the proposal in some systematic fashion there is no telling what will happen. The suggestion of full subsidisation of a programme, some of the elements of which are already present without any subsidisation, is dangerous. Furthermore, as has been emphasised throughout, a recurrent education and training system is composed of a number of possible programmes, some of which are very desirable, others not. It therefore makes considerably more sense to evaluate them individually, and then judge the financial arrangements that will bring forth just the amount of results under the programme which is desired on the social profitability criterion.

In the remaining part of this chapter certain more specific financial tools proposed in the literature of education and training will be discussed : these are (1) paid educational leave ; (2) retraining financed by employers at the workplace and at training institutes ; (3) loans to students, including those under income-contingent repayment plans ; and (4) drawing rights.

1. Paid educational leave

At its 49th (1965) Session the International Labour Conference adopted a resolution which advocates :

the access of workers to various types of paid educational leave, as distinct from holidays with pay for recreational purposes, in order to give them the opportunity and incentive to acquire the further education and training which they need to carry out their duties at the workplace and to assume their responsibilities as members of the community. ¹

This is a financial tool which could accommodate easily the universal continuing education and training proposal of Striner. Whether it will lead to disastrous consequences or not depends on the kind and the extent of recurrent education and training that it is supposed to finance, and the group of workers that is going to benefit. To illustrate the point we will consider two extreme cases. Professional workers, such as engineers, chemists, physicians and managers, may spend as much as 30 per cent of their working lives in keeping up with developments in their respective fields through reading, conversations or going to professional meetings. This is a continuing educational process which is a requirement of the kind of job they hold. Part of their pay is for performing this activity. University professors, if they are to follow a normal career pattern, understand that they are being paid in order

¹ Quoted from ILO : *Paid educational leave*, Report VI (1), International Labour Conference, 58th Session, Geneva, 1973 (Geneva, 1972), p. 1.

to be continually at the “frontiers of knowledge”. This requires an ever higher proportion of working time to be devoted to learning activities. In such cases paid educational leave cannot be considered as contributing anything new to the work situation ; it just is an alternative way of organising a required activity.

Paid educational leave for workers at lower levels of skill than the above is quite a different proposition, and several points need to be made. First, the educational activity for which paid leave is obtained has to be specified. Some of these activities are efficient, some not, as discussed in earlier chapters. Second, the necessity for retraining varies from industry to industry, and therefore a general paid educational leave system that does not take account of different industrial requirements, including the type of industry and size of firm, can be very inefficient. Third, the duration and frequency of paid educational leave cannot be standardised for all industries and levels of educational background of beneficiaries, if serious imbalances are to be avoided. Fourth, the question whether it is the firm or the public purse that pays for the leave is left open. The latter course distorts the allocation of resources because the cost of producing certain products is not borne by them. Moreover, the ultimate payers for the leave are not necessarily those who lay out the funds ; a great deal of shifting of the burden can occur, as is demonstrated by Becker.¹ Finally, since not all workers need and will take advantage of such leave, there is the possibility that inequities will arise. Usually those who are most in need of retraining are those least likely to undertake it, whatever the circumstances. A solution to this last problem is possible through the financial proposal of “drawing rights” discussed later. One of the few countries having already adopted paid educational leave by law² is France. However, it is still too early for an attempt to evaluate this financial tool.

2. Retraining financed by employer

Financing of recurrent education by the employer or groups of employers through payments to workers to cover some or all the costs of attendance, or through payments to institutions to provide a programme at the place of work, has long been practised in commerce and industry. Big companies often have good reasons for themselves undertaking extensive training programmes, and many of them do so. For the small company, office or store,

¹ Gary S. Becker : *Human capital* (New York, National Bureau of Economic Research, 1964), pp. 11-29.

² See Chapter 5.

however, the cost of training employees can be prohibitive. As discussed in the next chapter, the cost per trainee may be high when there are few of them, and the risk of losing trained employees to other enterprises is great. The investment in the employee cannot be recaptured in future productivity, with the result that retraining in small firms is limited in practice.

There are three possible ways of remedying the situation. Employer groups by industry can organise and agree on a cost-sharing plan in running training centres. The recurrent education programme thus becomes one that is specific to the industry rather than to the individual and employer, and this provides rational economic justification for financing by the employer. Such cost-sharing may nevertheless be dependent on legislation being introduced for taxes of industrial scope to be collected, as is done to a certain extent in many countries.

A second possibility is for private vocational schools to offer training which small companies cannot afford to give. Private secretarial schools and trade schools of different types are a good example of this possibility. Existing and prospective workers may have an incentive to pay the cost, but they may be unwilling or unable to do so. Some subsidies to such schools are warranted if workers fail to obtain training which would be in the national interest as well as in their own. But on the whole, payments from general revenues should only be made if training programmes help to achieve some social objectives. In most cases it is probably more appropriate for the industry employing them to subsidise the school.

A third solution is a massive manpower programme financed, directed and run by government agencies. The more efficient programmes of this type are those which have the support or participation of employers.

Which of these possibilities should be adopted is a question of efficiency. Where there are reasons to think that retraining offered at the place of work is more efficient, the first solution is to be followed.

3. Student loans

Certain types of recurrent education do not face all the barriers discussed earlier in this chapter. A great deal of vocational education and training, and some higher education, is not troubled with externalities and psychic returns. Market imperfections and some income distribution problems can be handled by a selective system of loans to prospective investors in skills. There are a few such systems in existence, but a great deal could be accomplished in expanding and modifying them.

In comparison with the lending institutions and loan arrangements available to finance housing and other consumer durables, developments in loan

financing of education and training have been small and unimaginative, and are least responsive to those with the greatest need for such financing. What is required is to design a system under which the borrowing group will contain an appropriate number of prospective high-income earners to offset the prospective low-income earners, so as to guarantee that principal, interest and administrative costs of the loan will be paid off. Friedman has suggested a solution :

The device adopted to meet the corresponding problem for other risky investments is equity investment plus limited liability on the part of the shareholders. The counterpart for education would be to "buy" a share in an individual's earning prospects ; to advance him the funds needed to finance his training on condition that he agree to pay the lender a specified fraction of his future earnings. In this way, a lender would get back more than his initial investment from relatively successful individuals, which would compensate for the failure to recoup his original investment from the unsuccessful. ¹

Such a scheme reduces the risk and uncertainty of the individual borrower too, and provides incentives for him to invest in skills. It encourages particularly recurrent education and training that is primarily designed for economic pay-off to individuals. Income-contingent loan-repayment plans have been much discussed in recent years. Many ingenious devices have been considered for dealing with the special problem of women and with the moral hazard involved in the insurance element, as well as for introducing various elements of subsidy deemed desirable. ²

4. Drawing rights

It is possible to argue that public policy towards the present system of formal secondary and (particularly) higher education by way of high subsidies has rendered some alternatives, particularly efficient recurrent education and training systems, non-viable. If effective freedom of choice can be created, such alternatives may spring up to a great extent by themselves. A fiscal tool that could create the desired freedom of choice is some variant of the National Youth Endowment suggested by Tobin and Ross. ³ This would make available to all persons at graduation from high school or at the age of 18, as a matter of right, a fixed sum (\$5,000) which could be drawn upon at any point prior to the age of 28 for any broadly defined educational purpose. Any person utilising his endowment would be committed to pay an income tax

¹ Friedman, op. cit., p. 103.

² These and other problems are discussed in detail in Robert W. Hartman : *Credit for college : Public policy for student loans* (New York, McGraw-Hill, 1971).

³ James Tobin and Leonard Ross : "A national youth endowment", *New Republic* (Washington, DC), 3 May 1969.

surcharge after the age of 28, at a specified rate per \$1,000 drawn. A great many variations on this proposal are possible. A particularly attractive one has been suggested by Dresch¹, who believes that the result of such a system of drawing rights will be far more revolutionary for the educational system than any of the policies of educational reorganisation proposed by proponents of recurrent education and training.

A more generalised form of drawing rights has been suggested by Rehn.² His proposals involve the creation of an integrated insurance system for transferring income between different periods of the life of an individual. A unified system of individual accounts would be created, in which all fees, taxes, study loan payments, pension contributions and other compulsory savings used to provide the individual with liquidity during periods of non-work would be recorded. Subject to specified limitations, each person would be given the right to draw on his account for purposes of study, recreation or other needs. The advantages of such a system are the same as those of the more limited educational drawing rights discussed above, but it provides rather more freedom of choice. The proposal includes a provision for countercyclical expenditures for skill formation, in that supplementary benefits would be offered to anyone willing to use some of his drawing rights to finance a period of training (or leisure) in situations where this is deemed desirable by policy makers because of a decline in the demand for labour. The proposal is ingenious and deserves careful study by anyone interested in recurrent education and training. By removing a great number of the barriers to individual incentives, it may lead "the market" to better performance in the field of education and training. An additional benefit, not to be disregarded, is the removal of some of the burden of decision-making in these matters from the government, including some of the cost-benefit analyses which at present are necessary.

CONCLUDING REMARKS

The brief survey of financial considerations presented here is more illustrative than exhaustive. Nevertheless, it has underlined the point that financial arrangements are a central issue in the economics of recurrent education and training. They may lead to disaster or they may lead to a reformed world of education, more efficient and just.

¹ Stephen P. Dresch : "US public policy and the evolutionary adaptability of post-secondary education", paper presented at the OECD Recurrent Education Conference, Washington, DC, 18-21 March 1973.

² Gösta Rehn : "Towards flexibility in working life", paper presented at the OECD Recurrent Education Conference, Washington, DC, 18-21 March 1973.

Throughout this study recurrent education and training in both developing and developed countries have been considered. In this brief chapter emphasis will be given to recurrent education and training in the developing countries by bringing together the considerations of greatest importance and relevance to them. Although the concept of recurrent education and training is the same for developed and developing countries, its concrete application will have to be adapted to the environment in the country in question, whether developing or not. The present remarks are not to be taken as a discussion of the implications of recurrent education and training in individual countries, but as an attempt to pick out the common problems of developing countries.

It is evident that, in a new field like recurrent education, most of the evidence and research on the subject stems from the more developed countries. Hence the relative imbalance between developed and developing countries in the choice of examples and references. However, in the following discussion, lessons learned from research and practical application in developed countries will be used to help in the analysis of the particular problems encountered by developing countries in the field of recurrent education.

Let us first recall the sense in which "recurrent education and training" is used in the present work, i.e. to refer to a global system containing programmes providing education and training at different levels (primary, secondary and tertiary) over the lifespan of the individual in a recurring way. This means that a central feature of recurrent education and training is the timing of different activities, such as formal education, training, work experience, throughout the life of an individual—in contrast with basic general education and initial vocational training which are traditionally timed early in life. Recurrent education systems and programmes may be designed to achieve a number of different objectives and, according to the objective pursued, the

change in timing from the conventional one may be either temporary or permanent. Temporary changes (for example, educational grants to ex-service-men) are instituted mostly for reasons of equity. Their temporary nature is due to the fact that they are meant to fill an educational or training gap between generations ; once the gap is filled there is no more need for the programme. In an economy with rapidly changing standards and demands for education and training the temporary nature of such programmes may be rather extended. These programmes were earlier classified under "investment in older individuals". Permanent changes (for example, the postponement of higher education for most individuals by three years) are suggested mostly for reasons of efficiency. They are permanent because they change the timing of certain educational and training activities indefinitely. These programmes were classified under "postponement".

FACTORS OF SPECIAL RELEVANCE IN DEVELOPING COUNTRIES

There are a number of special characteristics of developing countries that are of importance and relevance to the decision to introduce or expand recurrent education and training programmes.

1. Mortality and morbidity

At present there are still substantial differences in mortality and morbidity rates between developed and developing countries. Higher mortality rates for infants ¹ which do not reach a minimum until well into the teens may well argue for some postponement of primary school. Higher morbidity rates for the very young and for the older worker (40 years or over) may well argue for a timing different from that which is optimal for developed countries. Conditions in developing countries are rapidly changing, but differences in mortality and morbidity rates will not completely disappear in the near future, and will have to be taken in account therefore in a discussion of recurrent education.

2. External labour markets

Labour markets are far from perfect in all countries. What distinguishes developing from developed countries is the very much higher level of unemployment and underemployment of all types of workers, including higher

¹ United Nations : *Age and sex patterns of mortality*, Population Studies, No. 22 (New York, 1955) (ST/SOA/Ser.A/22).

education graduates. In tight labour markets employers have an incentive to train their own or newly hired workers. In a loose market they are able to pick and choose those already with training and experience.

3. Internal labour markets

On the average, internal labour markets differ considerably between developing and developed countries. The more important differences are average size of firm, extent of unionisation of the labour force, prevalence of tribal and seniority systems, and "traditions" of training. All these differences tend to produce fewer incentives for employers to train their workforce in a systematic manner. The smaller firms cannot take advantage of economies of scale in formal training. Small firms also are on the whole more likely not to survive changing economic conditions. Facing greater risk and uncertainty, they normally do practically no formal training. The large enterprises, which are usually better equipped for providing training, are frequently foreign or multinational enterprises often employing expatriate personnel mainly at the higher levels of hierarchy and in technical and highly specialised jobs. Size of firm is often strongly related to the extent of unionisation and prevalence of seniority systems; these too have their effects on employer incentive to provide training for older workers. Finally "traditions" of training may not exist in developing countries, though this last statement is rather a question-begging one. Traditions are actions that are repeated without any explicit decision being taken each time, because they have been found to be good practice. Thus, the so-called lack of traditions may simply be a combination of lack of good incentives for training combined with a certain amount of lack of knowledge of the consequences of training. In what follows the argument will rely as little as possible on tradition as a factor.

4. Characteristics of workers

Workers, and especially older workers, in developing countries have on the whole less general education, and the little they have is often of poor quality and has little relation to conditions prevailing in the work environment. As a result, training costs at the semi-skilled level are higher and require longer pay-off periods.¹ The disadvantage to the employer of losses of trained workers to other firms is greater, and this again reduces incentives to invest in training workers. This is reinforced by workers' attitudes and

¹ Bowman : "The costing of human resource development", op. cit., p. 449.

needs. High rates of "time preference" and aversion to risk-taking make workers unwilling to forgo higher incomes temporarily for what they regard as unlikely returns later ¹, so that it is impossible for firms to pass on even part of their training costs.

5. Externalities

Most of the externalities (benefits or costs which cannot be marketed because they cannot be appropriated by the agent generating them) attributed to education are associated with primary education and literacy. Important examples of externalities to be reaped by recurrent education programmes in developing countries are the benefits obtained from the dissemination of birth control information, personal hygiene information leading to the prevention of disease, and certain simple agricultural information which can prevent the widespread erosion of land on which so many depend for their livelihood. The existence of such externalities suggests a number of possible programmes of recurrent education for literate older individuals in those countries, particularly in the agricultural sector.

6. Distribution of income

The distribution of income in developing countries is more unequal than in developed countries. It is possible that certain recurrent education programmes may lead to a more equal distribution, whether measured at a point in time or as lifetime income. A prime example is the case of the village-level worker in India discussed in some detail earlier. At the same time the pressure on resources is also greater in developing countries, so that the allocation of resources problem can less easily be forgotten. In the case of recurrent education for the village-level workers, no conflict arose because the programme was both equitable and efficient. Other recurrent education programmes may involve conflicts in goals and priorities, and the resolution of such conflicts is difficult.

7. Obsolescence in skills

One of the stronger theoretical arguments for manpower programmes, and implicitly for certain recurrent education programmes of retraining, is that they cope with obsolescence and the resulting structural unemployment.

¹ M. J. Bowman : "From guilds to infant training industries", in C. A. Anderson and M. J. Bowman (eds.) : *Education and economic development* (Chicago, Aldine Publishing Co. ; London, Frank Cass, 1966), pp. 120-125.

The use of retraining programmes (so the argument runs) can reduce structural unemployment and thus shift the Phillips curve to the left. Such a shift allows policy makers to run an economy at a lower unemployment rate within given bounds of inflation. This is an efficiency argument in a dynamic framework. The argument has been applied to developed countries, and the question is whether it is equally applicable to developing countries.

In the present state of knowledge, the answer can be only very tentative. There are two reasons why the argument appears weaker for developing countries. The first is that bottlenecks in developing countries seem to originate in scarcities of physical capital and entrepreneurship rather than in categories of trained labour. This is a relative matter and it must be admitted that solid evidence on this point is also scarce. Entrepreneurship is a matter of education and training, but the substantiated knowledge on how it can be produced is scarce. The second reason for considering the argument weaker for developing countries is that obsolescence of skills is a less serious matter in a country entering the industrial revolution. A country with a rapidly expanding industrial sector obtains its growth and productivity increase mainly through a shift of the working population from agriculture to urban and industrial pursuits. Those already trained for these pursuits are less likely to be displaced by new industries or products, in contrast to the workers of developed countries where technological change and new products may require considerable adjustment on the part of the existing workforce. On the other hand a shifting agricultural population is poorly prepared for industrial work.

These arguments have their weaknesses, and will therefore not be emphasised inordinately in the following discussion of the scope of recurrent education in developing nations.

THE SCOPE FOR RECURRENT EDUCATION

Having reviewed a number of characteristics of developing countries which are of relevance to a decision to introduce recurrent education programmes, we may now discuss their implications.

1. Primary-school level

The suggestion has been made that, if the task were to maximise the educational achievement resulting from a six-year investment in universal education, the solution would be to defer the age of entry into government-

funded schools until the age of 11 or 12.¹ The suggestion is based on the following evidence² : (a) early adolescents learn the same material more quickly than young children ; (b) pupils who enter school at the age of 7 learn as much arithmetic by the age of 13 as children who enter school at the age of 5 ; and (c) vocabulary and reading comprehension in a second language are achieved almost twice as fast by 12 to 15-year olds as by 6 to 11-year olds.

The case for a postponed primary-school education in developing countries is strengthened by the fact that mortality and morbidity rates of children from 5 to 10 years are very high, but fall with age until they reach a minimum somewhere in the early teens. Thus by postponing primary education until 11 or 12 it would be possible to save a great deal of wasted human capital.

It is clear that postponement would be efficient if it in no way affects the stream of benefits and at the same time reduces the cost stream. The whole argument critically hinges on the reliability of the empirical evidence. Since in addition the argument ignores important costs, the proposed programme should, at least at present, be viewed with a great deal of scepticism.

The argument ignores the costs of child-minding to society if postponement of primary education is introduced. It also neglects questions of equity. It is very possible that postponement of primary education to a period when youngsters can contribute to the support of the family would effectively deny primary schooling to the poorer part of the community. Finally, perhaps even of greater weight, is the following objection :

If there is a particular sequence of investments in human resource development that is most effective, and if this sequence cannot be altered, deferment of the first step is deferment of all the subsequent steps that depend upon it. Once readiness for schooling has been reached, primary schooling seems to be this kind of investment for all those human skills for which literacy, for example, is a prerequisite. Moreover, the crude and relatively unformed productive capacities of men are less in the childhood years ; sheer physical strength is less. Less is therefore forgone by concentrating time and energy on schooling in those years. Prolonged deferment of primary schooling would evidently be a diseconomic decision, whether as a decision of an individual or one of public authorities with respect to a school system or a sub-population.³

This last argument is not an argument for universal schooling : rather it is one for making an early decision for those who will go on to a higher level of education. The argument for universal schooling is rather complex, and

¹ "Optimizing investment in schooling : An alternative to universal primary education", in *Education and development reconsidered*, Vol. 2, pp. 191-192 (paper presented at a conference sponsored by the Rockefeller Foundation and the Ford Foundation, 3-5 May 1972).

² This evidence was not cited in the above paper.

³ Bowman : "The costing of human resource development", op. cit., pp. 443-444.

cannot be set out in the short space available. Nevertheless, three of the main supporting reasons for a general expansion of primary schooling can be outlined briefly. The first is the relatively high level of external benefits derived from such schooling : these were discussed earlier. A second reason is the high complementarity that exists between the acquisition of literacy and numeracy, and the subsequent vocational training both of a formal nature given by firms, and the informal skill acquisition through on-the-job training. Finally, most of the accumulated evidence suggests that developing countries have expanded their higher education (and often secondary education) at the expense of primary schooling, and that therefore a certain redress of the balance is desirable.¹

The discussion up to this point has concentrated on the desirability of postponing primary education, and the somewhat qualified conclusion is that postponement of this level of education is not desirable. There remains the important question of whether educational resources should be allocated to adult literacy programmes : that is, does it make sense to introduce a temporary, admittedly long-term, recurrent education programme for older individuals at this level of knowledge acquisition ? The question raised has no easy answer. Mark Blaug has discussed it in considerable detail, and the reader is referred to his excellent exposition.² He shows that the question has no definite answer in the present state of knowledge. In particular, virtually nothing is known about the economic impact of raising literacy in developing countries. Nevertheless, he tentatively concludes :

If literacy teaching in the underdeveloped world becomes truly "functional" in the new UNESCO sense, its development value is very likely to be greater than that of primary education. Thus, the balance of choice in the future points to additional expenditures for adult education in the form of selective, intensive literacy campaigns.³

Adult literacy programmes in developing countries may be particularly productive in their large rural sectors. After reviewing the available evidence on the effect of education on agricultural productivity⁴, Schultz concludes :

¹ See especially Psacharopoulos : *The economic returns to education* . . . , op. cit., A. K. Sen : "The crisis in Indian education" (text of the Lal Bahadur Shastri Memorial Lectures delivered on 10 and 11 March 1970) ; Blaug, Layard and Woodhall : *The causes of graduate unemployment in India*, op. cit.

² Blaug : "Adult literacy in poor countries", in his *An introduction to the economics of education*, op. cit., pp. 247-264.

³ *ibid.*, p. 264.

⁴ Theodore Schultz : *Transforming traditional agriculture* (New Haven, Conn., Yale University Press, 1964), Ch. 12, pp. 175-206.

The key to growth is in acquiring and using effectively some modern (non-traditional from the point of view of the experience of people in a penny economy) factors of production . . . The suppliers of modern agricultural factors are, among others, research people who work in agricultural experiment stations. Their contributions in this connection are of critical importance. Farmers in their role as demanders of the new factors accept them when they are truly profitable. But, typically, farmers in traditional agriculture do not search for them. In the end, much depends on farmers learning how to use modern agricultural factors effectively.¹

But learning depends primarily on functional literacy, because the costs of distributing technical and economic information to farm people are very substantially smaller when published materials (farm journals, agricultural extension bulletins, printed instructions, etc.) can be used. Such functional literacy can be imparted to adults at reasonable cost within reasonable time, particularly if well planned to take place in the agricultural off-seasons when opportunity costs are negligible because of underemployment. The particular advantage of adult literacy programmes in the rural sector is that they can be selectively applied to adults who are committed to farming. The pay-off to such programmes is almost immediate and obvious to everyone involved, in contrast to the pay-off from their children's literacy, which may take many years to become apparent. Such recurrent education programmes in the rural sector, which are likely to lead to further learning and consequent increased productivity, deserve serious consideration by policy makers in developing countries.

2. Secondary-school level

As one moves up the educational ladder, the presumption against postponement of a given level of education becomes weaker. It is weakened by the impact of motivation on learning, work experience on motivation, obsolescence on the lifespan of productivity, and a number of other effects discussed earlier. These effects differ depending on the learning activity undertaken.

We begin by distinguishing four types of alternative learning activity at the secondary-school level. These are general education in the secondary school, vocational and technical education at the secondary level, formal training programmes run by employers, and pure on-the-job training or learning.

General education at the secondary-school level may be either terminal or preparatory for further schooling. If preparatory for further schooling, particularly in the scientific and technical fields in which continuity of work

¹ Schultz : *Transforming traditional agriculture*, op. cit., pp. 176-177.

is more or less a necessary condition to success, there is no argument for postponement. If terminal, it is a stepping-stone to employment and work experience where further vocational training may occur. This is usually the required background for entering training to qualify for the job of technician, be it a nurse, a primary-school teacher or a laboratory technician. People with this background are often scarce in developing countries, and there are no obvious advantages in postponing this type of education. The only serious problem confronting the educational planner of this level of general education is that, in the past, such education entitled individuals to well-paid positions in the government. Such past experience has created high expectations in the minds of the young and, if these remain unfulfilled (as is more often than not the case as secondary education expands), political trouble may threaten.¹

The *vocational school* at the secondary level is a more complicated matter. Vocational skills can be learned at school and at other places of training or through a combination of both. Even though such substitutions are possible they are far from perfect. Bowman contends "that some of the kinds of competencies that are most critical for development can rarely if ever be learned in schools, and that the costs of effective in-school teaching and learning of some others are prohibitively high, even though in-service learning may require prior education of kinds best provided in schools".² This argues for a "permanent postponement" of vocational school education.

Educational plans, and more generally educational advice to developing countries, have emphasised the importance of vocational education. Even so, most attempts to introduce narrowly defined vocational education in developing countries appear to have failed to attract the planned number of students. The blame is often assigned to the educational system for badly designed and irrelevant courses which need only to be improved to produce better results. In addition, preferences for non-manual work are blamed for lack of students with talent.

It is a reasonable working hypothesis that the young and their parents are not fools. Their aspirations are formed largely by their perception of the available opportunities. Where they actually end up depends on the actual opportunities in the economy. The link between these is the informa-

¹ The potential trouble may be reflected in the very high unemployment rates of secondary-school leavers. For evidence of such unemployment for Sri Lanka and Iran, see Dudley Seers: "New light on structural unemployment: Lessons of a mission to Ceylon", *International Labour Review*, Vol. 105, No. 2, Feb. 1972, p. 101; and G. Psacharopoulos and G. Williams: *Education and training implications of an employment strategy*, working paper for the ILO comprehensive employment strategy mission to Iran (Geneva, 1973).

² Bowman: "From guilds to infant training industries", *op. cit.*, p. 102.

tion available in the labour market. How good is this in developing countries? More information on this point is certainly needed, but it would be unreasonable to suppose that on the whole information is totally misleading. For at least one country, Ghana, it has been amply documented that aspirations have been formed by perceived opportunities in the white-collar, civil-service sector, and that therefore the education demanded is of the so-called academic type.¹ The study concludes that African schoolchildren have remarkably realistic job expectations.

Is it worth while to change incentives in order to make the vocational school more attractive to prospective candidates? One author suggests that vocational education in Nigeria should not only be discouraged, but that it should be discontinued.² His conclusion depends partly on the output of existing vocational institutions. Can these be improved or is there something about vocational education which makes it inherently a non-formal activity? Certainly a high percentage of vocational education is very liable to obsolescence, and is therefore less suitably given in the formal schooling system with its tendency to lag many years behind current practice. Most schools have enough difficulties in imparting the basic skills of reading, writing and arithmetic. Under the circumstances is it reasonable to expect them to provide vocational education?

Recent evidence suggests that graduates of secondary vocational schools in Jordan suffer the highest unemployment rate among school leavers, in spite of a growing demand for technical and vocational skills.³ This may be explained by the continued preference of employers for on-the-job training and more formal training programmes. As Bowman suggests, it is likely that the school as a social institution is efficient in imparting basic skills and general education, and is very inefficient in imparting vocational skills at levels below the university.

Given the accumulated evidence it is reasonably safe to conclude that vocational education in the school can be "indefinitely postponed", i.e. can be mostly dispensed with in developing countries.

The skills and knowledge acquired with formal *training programmes* appear on the whole to be more subject to obsolescence than those acquired in the school. This is partly due to their more specific and less theoretical nature. Their liability to obsolescence means that their economic value is

¹ P. J. Foster: "The vocational school fallacy in development planning", in Anderson and Bowman (eds.): *Education and economic development*, op. cit., pp. 142-166; reprinted in Mark Blaug (ed.): *Economics of education 1* (London, Penguin, 1968).

² Samuel Bowles: *Planning educational systems for economic growth* (Cambridge, Mass., Harvard University Press; London, Oxford University Press, 1969).

³ K. Marsden: *World Bank mission to Jordan* (Jan. 1972; mimeographed).

limited in time. In a growing economy with continuous switching between different techniques, the market puts a low value on old, specialised pieces of educational investment. Examples of such obsolescence were given earlier. The limited life of the value of the training means that it is only worth while giving it to a worker whose remaining working life expectancy is greater or equal to the life expectancy of the value of the training. The only serious argument against recurrent training is that the product forgone during training may be higher for older than for younger workers. This may be more than offset by (a) the "joint-product" nature of training and production, and (b) the complementarities between training and previous job experience and previous training. At any rate, such training tends to be of relatively short duration.

Although recurrent training may be and probably is an efficient investment from the point of view of society, there may be little incentive for it to take place, particularly in developing countries. The literature suggests that there is very little formal in-plant training or course training outside the plant in such countries. Whatever vocational skills are acquired by the labour force are mostly acquired by on-the-job learning (learning by doing). The reasons are not difficult to find. The incentives for such training are weak both for employers and employees because of certain characteristics of developing countries discussed in the earlier section of this chapter, which include features of the internal and external labour market (high unemployment rates, low unionisation, few seniority systems, small size of firms) and attitudes of workers towards risk and uncertainty. In addition, the incentives to train older workers may be further weakened by their higher morbidity rates in developing countries.

The heart of the dilemma is the serious difference between social and private returns. These not only inhibit programmes for the training of the labour force, but also investments, both local and foreign, that would involve large programmes of formal training. The only solution is to design public policies to overcome this differential in returns. A successful example of such a public policy is the Brazilian Government's Intensive Programme for the Preparation of Industrial Labour briefly described in Chapter 5.

The problem and implied solution have very appropriately been named by Bowman "the infant training industries" problem.¹ Infant industries are potentially productive industries hampered either by gaps in complementary industries and physical infrastructure, or by gaps in human competencies and know-how. The term "infant training industries" is used to direct attention to the role that the industry may play in developing such competencies.

¹ Bowman: "From guilds to infant training industries", op. cit.

Some of the more obvious public policies are (a) insistence on agreements that require foreign firms to engage in training and upgrading of local people to fill positions at all levels ; and (b) encouragement of temporary or permanent immigration of foreign workers, along with equipment and supervisory personnel. An important example of successful policies along these lines is the way in which Japan went about the task of creating "infant training industries". We close this section with Bowman's brief description of this experience :

Under the Meiji, Japan subsidised infant training industries on an extraordinary scale from the start. The men responsible knew exactly what they wanted most to accomplish : to build the industry and skills required as the foundation of military strength for national survival. They went about this task unhampered by either economic theologies or insecurities of self-esteem . . . The strategy aimed at the transfer of skills and know-how was multi-pronged, including expatriate teachers of Western subjects in the schools, overseas scholarships, and the importation of foreign experts to accompany the equipment for a new factory.

The foreign technicians were paid by the government at whatever world price was needed to attract them, regardless of Japanese pay levels. But their authority was confined to the exercise of only their technical expertise . . . The foreigners were required to train Japanese counterparts and assistants, and they were retained so long as they were needed to fulfil this task. During the early Meiji decades, labour mobility among enterprises was high at all skill levels, and the training that was subsidised by the government became diffused into other parts of the economy, as newly trained Japanese technicians moved to set up or assist in the operation of new enterprises . . . Probably never before or since in history (and I do not exclude Russia) has so rational a human resource development programme for industrialisation been conceived and executed.¹

As was suggested earlier, *on-the-job learning* or learning by doing, is the way in which most individuals acquire their vocational skills in developing countries. Depending on the amount of help given by supervisory personnel, fellow-workers or technicians, such on-the-job learning may have certain components of training in the sense in which we have been using the term in this section. From the point of view of recurrent education and training there is very little that can be said for or against on-the-job learning. It occurs presumably throughout working life so that there is no sense in talking about either a postponement or an exposure of older workers to it. Its absence, on the other hand, may have serious consequences on skills and know-how. Prolonged periods of unemployment, which occur to people more often in developing countries, have adverse effects on skills, morale and health. Only in that sense could one say that a postponement of on-the-job learning (unemployment) is undesirable. But this is trivial, and it makes no sense to stretch the meaning of recurrent education and training to that degree.

¹ Bowman : "From guilds to infant training industries", op. cit., pp. 127-128.

3. Higher-education level

The report of the ILO comprehensive employment strategy mission to Sri Lanka in 1971¹ proposes a recurrent education programme having the following main features : (a) a secondary education designed to be terminal ; (b) an overwhelming majority of secondary-school graduates leaving the education system for work and vocational training ; and (c) a possibility for everyone, after two or three years, to attend pre-university or university courses, selection being made by aptitude tests and evidence of work experience and community service, and subject to a quota system determined by some type of projection of likely future demand.

The main argument for such a programme was given earlier in this study in terms of reduced uncertainty through the greater self-knowledge gained. An exception to the argument is the case of the acquisition of skills and knowledge that require a certain sequence and continuity in application. This type of recurrent education programme can have additional benefits which cannot entirely be separated from the problem of uncertainty and risk. Among the benefits one might mention : (a) increased motivation for study resulting from a reduction of the risk and uncertainty about the specialisation ; (b) increased awareness and experience of the world of work, which may improve attitudes towards further education ; (c) experimenting with life styles and alternative careers not involving higher education ; and (d) an acquisition of work experience which is relevant to a future occupation. All these factors will, in one way or another, make the postponed educational experience more valuable in terms of the stream of future net benefits.

The efficiency argument for postponing higher education is thus reasonably strong. Equity may also be served by such a postponement in giving late-starters a more equal chance to a higher education. A more special argument can also be made for developing countries. In such countries there is a general tendency for public policy to produce more highly educated and trained people than the economy can absorb. This persistent tendency of over-producing highly educated people is most pronounced in higher education. The symptom is the high rate of graduate unemployment, discussed and documented earlier. It is possible to design a recurrent educational system in which all those who leave school for work may apply for entry to pre-university or university courses after a certain number of years, but are accepted only under conditions which are difficult to meet. The virtue of such a system is that it automatically increases the cost to students through the increased income forgone after a few years of work experience. The

¹ ILO : *Matching employment opportunities and expectations : A programme of action for Ceylon*, op. cit., pp. 140-145.

objective of such a system would be to cut university attendance drastically ¹ without paying the whole political price in cutting it early before students have entered the labour force. Clearly this is a programme which will alleviate the employment problem of graduates.

A number of programmes for young people using the model of intermittent education and work have been adopted by several developed nations. In the United Kingdom the most obvious example is the "sandwich course". Such programmes should be particularly attractive to developing nations because of their low total cost to society compared with that of full-time higher education.

Finally, in the context of postponed higher education, we should mention again the agricultural education programme for village-level workers described earlier, which has the advantage of meeting both the efficiency and the equity criteria.

Turning now to "second-chance" programmes for older individuals, the "investment in older individuals" argument appears relatively weaker for developing countries for two reasons. First, morbidity and mortality rates of older individuals (e.g. over 40 years) are very much greater, so that there would be reduced benefits to society. Second, a developing country can less afford to pay a high price in order to achieve a slight increase of equity between generations.

CONCLUDING REMARKS

Reviewing the evidence of general conditions in developing countries, we come to the conclusion that there are three promising types of programmes of recurrent education and training which deserve serious implementation by public policy. These are : (a) the set of programmes connected with the concept of "infant training industries" ; (b) the type of recurrent education programme suggested by the report of the ILO mission to Sri Lanka ; and (c) the type of programme described in some detail earlier involving the training of village-level workers and adult literacy programmes in the rural sector.

¹ On efficiency grounds in developing countries with graduate unemployment.

CONCLUSIONS

8

This last chapter will not reproduce all the conclusions reached in the course of the study. It will leave aside the well-established truths (and truisms) and will stress those issues and conclusions which have not received, in our view, adequate attention in recent discussions of recurrent education and training. It gives, furthermore, some suggestions for future research.

As was emphasised in the introduction, an internationally acceptable working definition of recurrent education and training does not exist at present. The diversity and number of definitions in current writing on the subject make it difficult to compare research results. For the purpose of the present study a working definition of recurrent education and training was adopted, i.e. a global system containing a variety of programmes which distribute education and training at different levels (primary, secondary and tertiary), by formal and non-formal means, over the lifespan of the individual in a recurring way, that is, alternated with work or other activities. This means that a central feature of recurrent education and training is the timing of different activities, or parts of activities, such as formal education, training and work experience, throughout the life of an individual.

The word "economics" was included in the title of the study so as to indicate that the main emphasis is on problems connected with evaluations of such systems and programmes from the point of view of the society as a whole, and from the point of view of the individual participants. Throughout the study it was emphasised that evaluations have to be undertaken with two main criteria in mind : efficiency and equity. However, in practice decisions on educational programmes are taken often on equity grounds alone. This may be justified by political considerations. Nonetheless, it is important to know the cost of such decisions in terms of efficiency. Of course, in the reverse case, if a decision were to be taken on efficiency grounds alone, it would still be important to know the price to be paid in terms of equity.

The title of the study also links education and training. The linkage was not an afterthought but a deliberate step of exposition. In our view of the process of creation of skills and knowledge it is indispensable to discard the traditional separation of education and training. Most recurrent education programmes, and of course also recurrent education systems, contain elements of both.

Early in the study a basic distinction was made. Recurrent education and training activities can assume two very different aspects. One is the institutionalised postponement of an activity involving a more or less permanent change in the timing of the activity. The second is the temporary introduction of opportunities of education and training for older individuals in order to meet what are considered as purely transitory conditions. Both of these aspects can be evaluated from the point of view of equity and efficiency.

The major analytic conclusions reached are that, other things remaining the same :

- (a) the human capital losses in an option of "postponement" of even as little as ten years are a very substantial portion of the capital value of the investment ; and
- (b) the human capital losses of an "investment in older individuals" are small (and perhaps non-existent) compared with either the capital value of the investment or the losses involved in an institutionalised "postponement".

As is shown at certain places of the study, there are small exceptions to these general conclusions because other things do not always remain the same. Nevertheless, the conclusions apply sufficiently often to deserve underlining in this last chapter.

A major difficulty encountered in arriving at precise conclusions is the scarcity of existing knowledge on what might be called "the production function" of skills and knowledge. Such a function would relate the level of skills and performance of an individual over time to the level and timing of the inputs of formal schooling, work experience, abilities, interests, leisure, and their interactions. It is especially these interactions that are least well understood. Without this knowledge it is often very difficult to give advice on certain recurrent education programmes. For that reason some of the evaluations presented in the study are tentative. The particular relations of the production function of skills and knowledge of special interest to recurrent education and training have been identified throughout the study, especially in Chapter 4. These relations can be seen as an agenda of problems calling

for intensive empirical research before the tentative results of the evaluations can be accepted with the necessary confidence by policy makers.¹

Nevertheless, unambiguous conclusions on some of these relations could be reached. The more important ones are :

(a) Empirical evidence on deterioration of physical and mental abilities with age does *not* constitute a serious argument against recurrent education and training for older people, at least not up to the age of 50, provided there is an adequate educational background. Physical deterioration is usually compensated by other factors which will have to be taken into consideration when designing recurrent education and training programmes for older people.

(b) Empirical evidence allows a rather unambiguous answer to the question as to which groups of the working population are particularly vulnerable to obsolescence. The poorer the educational background, in terms of quantity and quality, the higher is the risk of obsolescence. In general, technical and specific education and training are more subject to obsolescence than general education and knowledge. Increased attention given in early years to the development of those intellectual capabilities which facilitate the individual's ability to adjust to change in later life also contributes to reducing considerably the risk of obsolescence. The optimal role of recurrent education as an antidote for human capital obsolescence seems to be preventive rather than curative. Efficient programmes which would allow the non-obsolete individual to keep abreast of current technology are more attractive than attempts to isolate obsolete individuals and to enroll them in formal course work.

(c) There are certain sequences of investment in human resource development that are more effective than others. These sequences may not be the conventional ones of formal schooling up to age 18 or 21, followed by experience on the job. On the other hand, the possibility that there are "most effective sequences" implies that the postponement of certain steps may have drastic consequences on future productivity. Certain professional skills require early development and continuity of study for their full fruition. For work of this kind recurrent education of the type that spreads the process of learning over considerable periods of the life of the investor has a great disadvantage.

(d) Ginzberg's research on the different stages of occupational choice contributes to making a strong case for recurrent education programmes for

¹ An example of such a relation is : How, and to what extent, can work experience successfully replace academic or school learning ?

a large part of the population which, at an apparently too early time in life, has made a choice of a skilled trade or occupation. The risk and uncertainty facing this group of the population thus appears to be greater than that facing university students.

(e) As it is apparent that the level of educational and occupational aspirations is directly related to the level of the individual's socio-economic background, it would seem necessary to undertake some corrective measures, if only for equity reasons. Recurrent education and training programmes and better guidance and information can effectively contribute to closing the educational and occupational gaps between socio-economic classes.

In evaluating certain sets of recurrent education and training programmes the study reaches the following important general conclusions :

(1) Formal general education, including higher education for both men and women, should not be postponed for more than two to three years. Systems involving a longer postponement become very inefficient and therefore costly, and furthermore cannot be justified on grounds of equity. In the case of the "hard" sciences and mathematics even a postponement of two to three years becomes difficult to justify. A short postponement is efficient if such a period of search and experience can sufficiently reduce the risk of having chosen the wrong specialisation, particularly since higher education is such a costly investment.

(2) Formal general education, including higher education, could be provided to older persons, both men and women, who have not had the opportunity to receive such education earlier. Such programmes are not too inefficient and can be justified on grounds of equity.

(3) Programmes of intermittent education and work at the higher-education level appear quite sensible except in the "hard" sciences.

(4) Programmes of recurrent training for workers of almost any age appear efficient in general, particularly under employment systems which reward seniority. Seniority as an institution forces employers to ensure that older workers are as productive as possible.

(5) No serious argument has been found against recurrent training programmes for workers threatened by obsolescence. The training cost can usually be amortised over the lifetime of the value of the training.

These general conclusions apply equally to developed and developing countries. Fundamentally there is no difference in the concept of recurrent education and training for these two types of country. On the practical side, for a number of reasons (morbidity and mortality differences, and dif-

ferences in the internal and external markets for skills), there appears to be a relatively more limited scope for recurrent education and training in developing countries. Furthermore, while developed countries can permit themselves the luxury of putting a heavy accent on equity at the expense of efficiency, developing countries cannot. Nevertheless, certain specific recurrent education and training programmes appear to make a great deal of sense. Before we list these, it is tempting to ask the question : Is it reasonable for developing countries to embark on the complex task of introducing a recurrent education and training system in environments where the existing traditional education systems are so far from meeting the most urgent needs and are plagued with so many problems (poor teachers, large number of drop-outs, irrelevant curricula, etc.)? The study evades this ambitious question and limits itself to some more manageable problems. It concludes that there are three promising types of programmes of recurrent education and training that deserve implementation by public policy. The first is the set of programmes connected with the concept of "infant training industries". One such example was the experience of Brazil, as described in Chapter 5. The second is the type of recurrent education programme suggested by the report of the ILO mission to Sri Lanka. The third is the type described in some detail (also in Chapter 5) involving the training of village-level workers. The latter is an exception to the general rule formulated earlier that it is not efficient to postpone higher education by more than a few years. In this case the postponement is of about ten years. The main reason for the efficiency of that programme was the possible reduction of the investment period from three to two years because of excellent prior work experience. Related to this rural programme is the promising adult literacy programme in the rural sector briefly discussed in Chapter 7. Literacy of committed farmers is a prerequisite to their efficient learning of modern farming methods.

A chapter was devoted to the rather complex financial considerations involved in recurrent education and training. How the cost of recurrent education is to be shared between students (workers), employers and taxpayers is a central issue because it largely determines who will be educated and trained and in what fashion. The motivation for undertaking a given programme may vary from one investor to the other. It is important to find out, at the planning stage, which investment is the most profitable from the point of view of all investors, taking into account equity considerations, and to provide the necessary information and create the right incentives. The danger of creating incentives through subsidisation is twofold : (a) the subsidy may be extravagant, leading to over-investment in certain skills, with well-known consequences ; and (b) once a certain subsidy has been introduced, it may be politically almost impossible to cut it to a more rational size.

To escape the possible consequences of an overqualified labour force, unhappy and bored because they cannot use their qualifications, and more highly unemployed because of higher aspirations, rational planning involving evaluations of the type discussed in the study is imperative. The chapter concludes with a description of the effect on incentives of a number of different financial tools available to the policy maker.

Two general warnings were sounded, mainly in Chapter 3. First, it has to be borne in mind that recurrent education and training programmes, even if efficient, may increase the educational gap between socio-economic and age classes, because it is usually those who already have a good educational and training background who volunteer for additional education and training. Second, as suggested, the object of recurrent education systems is to increase people's freedom of choice, especially for those at the foot of the social ladder ; this, it is hoped, will lead to a more egalitarian distribution of income. If everyone is educated to the limit of his capacities it may well happen that inequality of income will be intensified because the untalented will lag behind. The danger exists that permanent education will lead to permanent stress on performance and achievement. In that case perhaps alternative ways of reducing income inequalities should be considered.

These warnings are based on reasonable speculations. Nevertheless they remain speculations because of the scarcity of serious empirical research on the effects of recurrent education and training on the distribution of economic welfare, compared with the effects of taxation and transfer payments on the same distribution. Furthermore, throughout the study we have pointed to the lack of empirical evidence in a variety of other related fields. Some of the conclusions reached had to be made on the basis of general assumptions or even on "reasonable" speculations. It is hoped that the study will inspire further empirical research on the problems in question.

The question of whether recurrent education and training contribute to employment creation, or to the reduction of visible and disguised unemployment, is not easy to untangle and cannot be answered globally. It was found that *certain* recurrent education programmes have a positive impact on *certain* employment problems. For instance, recurrent education programmes aiming at further training and promotion of workers in employment may liberate positions to be filled by less qualified unemployed workers. In developing countries, programmes to train nationals through recurrent education to take over jobs from expatriates have similar employment effects.

In general, it can be said that, where unemployment is truly structural, recurrent education, and particularly certain types of recurrent training, clearly facilitate re-employment. Where the demand for labour in general

is inadequate, it is difficult to see how recurrent education, or for that matter any education, can do much more than spread the unemployment around. But even simply spreading the unemployment around may have significant benefits. As was pointed out early in the study, the goal of employment creation and promotion recently accepted by many of the governments of developing countries is justified mainly by its effect on the personal and regional income distribution.

A final warning is perhaps not out of order. The fact that a recurrent education system calls for a large volume of temporary programmes, apart from a set of permanent or relatively permanent programmes that appear efficient, means that such a system has to be highly flexible. Unfortunately, it needs no special documentation to show that flexibility is not one of the virtues attached to most education ventures.

Furthermore, it would seem that a reasonable recurrent education system cannot be obtained by simply introducing a set of recurrent education and training programmes into the existing education system. In order to construct an effective recurrent education system, it is not enough to adopt certain recurrent education and training programmes ; great changes are needed at the same time in the methodology of teaching and learning as well as in administrative and financial practices.

The conclusion to be drawn from these considerations is that although recurrent education does promise certain concrete benefits, it is not going to solve all our problems, as suggested by some of its supporters. If not introduced with considerable preparation and care, it may only make the whole educational system an even more unmanageable colossus than it already is.

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