

Planning Investment in Education: Some Problems and Strategies

IN any economy there is a strong tendency for people with certain levels of education to hold certain types of jobs. For example, in developing countries nearly all people who have received a university education work at professional, technical, or managerial jobs usually either in government or as independent professional. People whose schooling ended at the secondary level tend to hold middle level jobs in the clerical, sales, and service occupations. Half or more of the labour force in the typical developing country is made up of farmers and agricultural labourers who have received little or no formal education.

that investment in human resources helps to accelerate economic growth. It does this by increasing labour productivity, encouraging greater physical investment, and reducing the dependency burden of the population. These contributions to growth are especially evident in the case of education.

Some unresolved problems in planning for national development that continue to plague the newly emergent countries centre around the issue of investment in education. Crucial among these problems which rightly seem to agitate the mind of the planner are:

- (1) What is the most appropriate level of investment in education in the application of the available resources to national development?
- (2) How can this investment be best distributed among the various types and levels of education so as to achieve the desired balance between the supply of and demand for educated and trained manpower?
- (3) How can the mechanism for the conversion of the educational 'input' into 'output' be so streamlined as to maximise its productivity, both in quantity and quality?

These problems stem essentially from the constraint imposed by the competing claims of the various sectors of development on the limited resources available to a developing country. Theoretically they are not beyond solution. It is known to the planner that his risk is to plan the application of the available resources to the various ends in such a way that the return on the investment is maximised in terms of the rate of economic and social development.

The general principles underlying this concept are:

- (1) The different sectors of development are interdependent, rendering it necessary to strike a balance in the allocation of resources among the competing ends recognised as important to economic development.
- (2) Educational development should therefore be inte-

grated into the total plan so as to ensure that the supply of qualified manpower is matched by the demand for it.

- (3) Underinvestment or overinvestment in any one of these interdependent sectors of development leads to an imbalance and retards the rate of the overall growth of the country.

The translation of this theory of balance into a planned programme of action, however, bristles with many difficulties inherent in the social and economic situation of a developing country. It is true that during the last two decades notable advances have been made in refining the planning instrument and theoretically it is possible for the planner to es-

timate the economic demand for education of various types and levels through the use of various techniques singly or collectively. But the forecasts even within the limited scope of the economic demand are vitiated by the difficulty in controlling the many variables affecting the input-output coefficients in the rapidly changing conditions of the developing countries, as also by the peculiarity of the production function of education and the complexity of its conversion mechanism. What follows in this paper is a brief discussion of some of these problems peculiar to educational planning and some of the strategies that may be tried in the formulation of a plan to deal with them.

THE CURRENT TREND OF INVESTMENT IN EDUCATION

Each of the developing countries in South and South-East Asia has a rich cultural heritage in which education was held in high esteem. Until the launching of the planned effort for overall national development, education was, however sought primarily for its human and social values. It was even regarded as an end in itself in so far as it aided the self-fulfilment of the individual. Inevitably in such a system the economic objectives occupied a place of secondary impor-

ance, and the vocational elements in education received very little attention. But the new passion for progress and advancement which swept these countries brought in its wake also a new awareness of the importance of economic growth. In the process, scientific and technological education hitherto almost completely neglected, was suddenly pushed into the focus of public attention and education came to be valued for its vital role not only in social and cultural development but also in economic development. The plans of these countries for national development present some of the most exciting social and economic experiments and the plan performance in achieving the targets of development is indeed very striking in many cases.

Most of these countries are now poised for still greater effort towards the goal of an economic and social breakthrough. The task ahead is, however, full of problems and challenges (briefly discussed below) which must be viewed in their correct perspective and approached with objectivity and vision.

Firstly, in spite of notable rise in the expenditure on education which is at least partly accounted for by the insignificant size of educational expenditure in the pre-plan period, by and large the level of expenditure on education reached in most cases after years of planned effort hardly exceeds 2 per cent of the G.N.P. (per capita G.N.P. being \$ 170). This points up the increasingly widening educational and economic gap between these countries and the advanced countries, which spend from 4 per cent to over 7 per cent of their considerably much larger G.N.P. (per capita G.N.P. being \$ 1,100 approx).

Secondly, in terms of real educational development as indicated by the ratios of enrolment to the school-age population at various levels, the situation is even more disconcerting. The average enrolment ratios of 42 per cent in the first level, 12.4 per cent in the second level and 1.6 per cent in the third level in these countries are in sad contrast with the corresponding enrolment ratios of 73 per cent

59 per cent and 11 per cent respectively in the advanced countries [4: 45-8].

Thirdly, the picture becomes still more depressing when account is taken of the serious underinvestment in certain types of education at various levels, for example in the fields of scientific, technical and vocational education. The deficiencies in these vital areas of education are evidence of imbalances within the educational system adversely affecting its fruitfulness.

Fourthly, the high rate of attrition at various levels detracts further from the effectiveness of the current investment in education and underlines serious interferences in the mechanism for conversion of the educational 'input' into 'output'. The inference is that the present investment is either inadequate for the size of the programme or not being effectively applied. This rate of attrition is as high as 70 per cent in some cases.

Fifthly, even though the Asian countries officially recognise the pervasive value of primary education, and are committed to what is known as the objective of universal compulsory education reaffirmed by all the Asian nations under the Karachi Plan in 1960, the progress made to date indicates this objective has not been achieved in all the countries by 1980, the target year.

Sixthly, while under political and social pressures higher education continues to grow, it is still deficient both in quantity and quality. Besides, investment in research is extremely insignificant. In 1960 expenditure per head on research and development was as low as \$ US 0.1 in Pakistan as well as in India, compared to \$ 6.2 in Japan \$ 3.4 in Britain, \$ 36.4 in the USSR and \$ 78.4 in the USA [5].



Personality of a teacher is an important factor in effectively influencing the minds of pupils in a classroom. An old teacher applying techniques to draw undivided attention of young learners and project her personality into them to have successful interactions.

producers, namely primary, secondary and tertiary. In the developing countries research has a key role to play through the application of higher knowledge to the economic and social problems which beset these countries in hundreds.

It cannot be overemphasised that the rate of economic growth cannot be faster than that of the development of human resources. The people are both an end and a means of development. There is no instance of a developed country where the people are underdeveloped. Conversely, there is no instance where the people are developed and the country has remained underdeveloped.

DIVERGENCE BETWEEN PLAN CONCEPT AND PRACTICE

Contrary to the value theoretically attached in the plan concepts of most of these countries to the role of education in the formation of human capital, in practice the traditional attitude towards education as a social service and consumption seems to linger on in the minds of the planners and policy-makers in their understandable concern for accelerating the pace of economic growth. As a result,

they tend to assign a high priority in the allocation of resources to investment in physical capital, steel mills, dams, fertiliser plants are looked upon as symbols of growth, wealth and prestige and they get the precedence. More or less as a logical corollary to this concept of investment, it is considered essential to cut down on all consumption and plan more on 'production' so that as a result of increased prosperity more will be available to be spent on social welfare activities. By implication all education except technical, vocational and professional education is regarded as consumption and placed in the category of social welfare activities.

It is, indeed, evident that the proposition that education is an investment in human resources finds acceptance in most plans as a philosophy rather than an economic reality. In the end a lower priority is assigned to educational development. Such a situation underlines a disturbing gap between theory and practice — an outcome of the fact that the general awareness of the economic value of education still remains dim and unclear. Throughout this region where education has been tradition-

ally held in high esteem, the economic value of education is taken for granted by the educators. The subject, however, has received very little attention from them as a field of research.

When we consider education as an investment, we must consider it as purposefully as other forms of capital outlay. This the older and more developed countries do not necessarily do or need to do. Wealth has made it possible for them to be much more easy going. The new country cannot be so permissive towards those in whom it invests.

Even viewed as a consumer good, education is hardly ever entirely present consumption. Because it is more enduring than most other durable consumer goods, it is a source of future satisfaction and adds to future real income. But these satisfactions are not taken into account in measuring national income. Neither does the economic analysis take into account the benefits flowing from an individual's education to his family, neighbours, employer, co-workers and the society, which may be called 'external economies'.

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Know-how for the Developing World

A wide range of practical information for improving living conditions in developing countries is given in the latest books issued by Britain's Intermediate Technology Development Group (ITD).

One explains how developing nations can mobilise and absorb the energies and industry of future generations by providing them with opportunities and productive work.

Entitled "Skills for Life-Experience of Training in Three Developing Countries", it examines the appropriateness of institution-based vocational training schemes as means of equipping young people with the skills and attitudes they need to become productively employed.

A comparison is made between three studies of training

institutions and their programmes — one each in west and central Africa and one in Trinidad.

Another publication, "Renewable Energy Technologies", provides a detailed survey of the main methods — bio-energy and biomass, solar energy, hydroelectric, wind and water power. The socio-economic and environmental implications of the technologies are discussed as well as their suitability to the needs of poorer nations.

Ways of preventing famine are explored in a book entitled, "To Cure All Hunger — Food Policy and Food Security in the Sudan". This is based on lectures from a conference at the Institute of Development Studies at Sussex University in Brighton, southeast England.

"N O," flashes the computer screen. "Conceive" is spelled o-n-c-e-i-v-e. 'I' comes before 'e' except after 'c'." The student tries again. "RIGHT!" On to the next one, and another mistake. "I'm never gonna learn this," moans the discouraged student at the keyboard.

Next to him, another student works on her math: "63 + 25." There is a muted hum of activity in the cramped room, as students work and chatter. Maps of the world line the walls. The teacher admonishes some one as the chatter increases, just like in any 6th-grade classroom. Except that the students here are almost all over 25.

They are some of the functional illiterates of America, unable to read or calculate enough to lead a normal life. These men and women hold jobs, sometimes at the management-level; some run their own successful businesses; a few even have high-school diplomas. Yet they cannot read highway signs or appliance instructions, nor can they figure out why 25 cents is a quarter of a dollar. 25 million adult Americans cannot read labels on products; 35 million are vocally handicapped due to inadequate reading skills.

Literacy experts are pointing to a variety of reasons for this epidemic: a lax school system, growing economic pains, inner-city trouble with drugs. Each factor is tied to the other, and authorities are often at a loss which to tackle first.

Encouragement of creativity leads to a far less strict discipl-

The Other Illiterates

by S. Bari

line in American schools than in their European or Asian counterparts. Failing one's senior year in high school twice in a row leads to automatic graduation. Teachers are paid appallingly low salaries (among the lowest of professional occupations such as medicine and law): an average of US \$26,000 per year. Incentive to enter the teaching profession has been low. Lately, not only low pay has been the issue: 57% of the teachers leaving their jobs cited work conditions as their reason, not salary. Violence, lack of discipline, drugs, excessive bureaucratic responsibilities, are all culprits. One out of five teachers need to supplement their income with a second job. Fewer of the best university graduates are opting for teaching careers.

The urban areas are those most at risk. Minorities such as blacks and Hispanics are sinking deeper into gang-controlled ghettos. Parental abuse and narcotics take their toll on children at this crucial stage of their education. Michael, 24, left school at 16 in order to work for a living, a task his errant father was incapable of doing. Don, 21, is not allowed to work by his father, because the unemployment benefits Don receives from the government help support the

entire family. The list of high-school dropouts and undereducated unemployed youth keeps growing. Family ties are loosening all over the country, and through a wide spectrum of social classes, despite TV sitcoms that show children and parents embracing in the final shot of every episode.

Literacy is lower in the South, which suffers from slower economic growth and higher concentrations of immigrants, and where poverty is more widespread. In Texas alone, over half a million people are functionally illiterate.

Bush has billed himself as the Education President, since panic is growing as tests and surveys rank American schoolchildren behind those of other developed countries. Asian minorities are doing disproportionately well, a phenomenon that many find disturbing.

The teaching profession has been promoted, and various plans for improving school performance are being implemented. But the adults who missed such improvements are the ones that are suffering the most as a result. For this group, literacy programmes (often called Adult Basic Education) are mushrooming. I visited one such class, offered by the state tuition-free.

The majority of the students read and calculate at or below a 6th-grade level, some have nonetheless worked for years, and are now required by their employers to obtain a GED (General Education Diploma) in order to keep their jobs. Others have recognized the handicap of limited reading skills, and attend class in the hope of training for better-paid professions.

Samson, in his thirties, has gone through life with no concept of money or of handling change. An abusive mother at home, and a severe learning disability, have hampered his progress. Juan, of Mexican heritage, was injured on the job, and suffered partial memory loss. The overwhelming majority of these adults have Hispanic names, and a disturbing number are black. The class is a graphic example of how far racial unity has really progressed in the country of Martin Luther King, Jr.

In order to be promoted, a student must improve by one grade-level per semester. About 50% achieve this goal. Computers are available, but only by rote. Spelling and math take up most of the time, with basic science and social studies as additional subjects. Teachers will tell the students about a particular country, the

people, and a little of its geography. When told I was from Switzerland, they wanted to see it on the map.

There is room for improvement. Some literacy programmes are money-making scams. But those that do offer free classes are also beset by financial troubles. Politics and cronyism run rife, according to insiders, and as a result, efficiency is far below the potential. Recently school districts were denied more federal funding, and education professionals are upset about the neglect. "Poor education can only lead to more students turning up at adult education classes later in their life. The taxpayer had better pay now for the kids, than later for the adults," was one teacher's opinion.

The victims of the lack of funding and poor management are always the students themselves. When they decide to attend a literacy class, it is a decision involving job and family: how to get part-time work, where to leave the kids. One man was well-paid as a security guard, but slept through class because of the long night hours. Leaving, on the other hand, is an easy decision. Through the inevitable frustrations and monetary difficulties, the students must try to stay on, and all that is possible must be done by the administration to see that this is what happens. Because when they leave, like 26-year old Bruce, it is for the streets and the drugs that they head, abandoning all hope of a decent future.

DID YOU KNOW?

- In all regions of the world women constitute around 90 per cent of the teaching force except in the Arab States (51 per cent) and Southern Asia (61 per cent).
- About US\$50 billion will be needed over the decade to make sure every child is attending primary school by the year 2000. The annual cost by the mid 1990s is roughly equivalent to the amount the world now devotes to military expenditure every two days or the total of the USA's annual expenditure on cigarette advertising and what the USSR spends a year on vodka.
- On average, children in poor nations receive 400 hours less of schooling per year than children in rich nations.
- Between 70 and 90 per cent of enrolled literacy learners in many African countries are women.
- Countries throughout the world currently spend an average of \$20,000 per year on a soldier but only \$350 to educate a child.
- In the early 1980s public expenditure on education as a percentage of GNP declined in Sub-Saharan Africa and Southern Asia, but increased in the Arab States, Latin America and the Caribbean, Eastern Asia and Oceania.
- During the 1980s there has been a net transfer of resources from poorer countries to the richer which by 1988 totalled \$50 billion annually. In the same year, the outstanding debts of developing countries stood at more than \$1,000 billion.
- Almost two out of three teachers in developing countries earn lower salaries today than they did in 1980.

Source: Unesco, Unicef

Computer Approach to Education

by Igor Volkov

I should warn you right away that a computer-based approach to teaching has nothing to do with computerised education. Computerisation of education means the use of computers in the teaching process and the training of students in handling computers, whereas a computer-based approach to education regards the human brain as a computer or machine. And the education based on this second approach implies the use of the parts of the brain which are under-used today.

To be able to 'talk' to any machine one should know the language it understands. If you want to solve a problem with the aid of a computer, you have to feed a definite amount of data into it. If you miss some data, you won't get the right answer.

The same is with the human brain. If it lacks the required amount of information, it will not solve this problem either. If we feed into the human brain a vast amount of information necessary for the solution of a problem and also feed into it a lot of superfluous information and do not explain to it what kind of information it should use, where and when, it will never solve the problem.

If we formulate the task in most general terms, as is the case with "harmonious development of the individual", we shall get nowhere. Incidentally, this is the main drawback of the Soviet school reform. It has failed to produce the desired results because we do not know what we want to achieve through it. Thousands of teachers and scientists and a whole academy are working on this problem, but it will never be solved unless we formulate precisely the ultimate aim of schooling.

However, there are three fundamental differences between a computer and the

human brain. The first one is that computers are serially produced. If computers are designed for one specific purpose, they will also work in the same way regardless of where and when they were made and who made them. Unlike a computer, every human being is individual. There are no two men in the world with similar abilities. So, not every person can solve all the problems with equal success; he may be very successful in some field, mediocre in another and totally incapable in yet another.

The second difference is that a computer that has come off the assembly line will be

able to work as soon as programme is fed into it. The human brain, however, cannot solve any problem without prior and prolonged training.

The third difference is that machines have no feelings and therefore with the same algorithm they will all produce the same results. A human being has feelings, which are also individual, and therefore with the same data fed into the human brain, it will produce different results in different people. This particularly applies to creative tasks. Repin, Surikov and Vassnetsov studied in the same Russian Academy of Fine Arts under the same

programme, but their work is extremely individual. The same is true of Chekhov, Tolstoy, Lermontov, and other talented people.

So, the computer approach requires that a final goal should be formulated as precisely as possible, that is what a student should be able to do, not just to know, by the end of the instruction period. The amount of knowledge which a student should acquire to solve this problem should be clearly defined and an algorithm of its solution should be made. That's all. The teaching methods remain the same and are based on the fundamental rules of the teaching profession and psychology: a teacher should be able to explain things to his students in comprehensible terms and in a consistent manner. He should be able to illustrate his theses by convincing examples and take into account the age differences.

Thus, the computer approach requires that a teacher inculcate in students' minds not just facts but algorithms for the solution of many different problems, including creative ones. These algorithms are normally very simple and can be described in very few words, so a student can absorb and test in practice a great many algorithms. At the same time, the amount of information every student has to obtain and memorise for the solution of specific problems is hundreds or even thousands of times less and this leaves more free space in a student's mind to absorb some other information he needs. As a result, teaching becomes many times more effective and the learning period can be sharply reduced.

Here are some examples from my own experience. I am a drawing teacher, an artist by training. In 1974, I organised a school art studio. My ultimate objective was to find artistically gifted school children and give them fundamental professional training, which would allow them to become later top-notch artists. Experience has shown that the use of the computer approach in schools may help reveal many potential talents even within the framework of the conventional secondary school.

Where should we begin? First of all, we should find out the difference between a "talented" artist and a "not talented" one and clearly define this difference. I am convinced that talent has two distinctive characteristics.