

COST-BENEFIT ANALYSIS OF EDUCATION IN NIGERIA

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ABSTRACT

All over the world, education is recognized as a veritable tool for individual and national development. The realization of this, perhaps, led to the early introduction of formal education. Consequently, various sums of money are earmarked annually for the provision of educational services to the people by the government. The Federal Government's capital and recurrent expenditure on education has being on the increase over the years. For instance, it rose from 26,721.3 million naira in 1998 to 31,563.8 million naira in 1999 and in 2005, it increased to 120,035.5 million naira. Besides, enrolments in the various levels of education have tremendously increased over the years. In this direction, primary school enrolment in Nigeria increased from 19,907,010 in 1999 when the UBE programme was launched to 19,158,439 and 19,384,814 in 2000 and 2001 respectively, as well as, other levels of education. The inference that emerges from the increase in expenditure on education, coupled with the increased enrolment at all levels of education is that, individuals and societies believe there are costs and benefits from acquiring education. Here lies the essence of Cost-Benefit Analysis (CBA) of Education. Consequent upon this, this paper therefore, discusses education as an investment and as consumption, the nature of cost and benefit in education, opportunity cost, criteria for CBA, such as the Net Present Value (NPV), the Internal Rate of Return (IRR) and the relevance of CBA in the developing economies with particular reference to Nigeria; due to the numerous educational projects that are currently on course yearning for the limited scarce fiscal resource.

INTRODUCTION

In developed and developing economies of the world, education has been recognized as a veritable tool for human resource development and consequently national development. This is perhaps, sequel to the role education plays in the production of various types of manpower for all the sectors and sub-sectors of any economy. In line with this, Eder sees education as a manpower industry producing knowledge and skills necessary for development (Eder, 1966).

Education can be acquired formally through the school system, and informally in the family, on-the-job training, through apprenticeship, adult programmes, various media and by self-improvement. In Nigeria, therefore, education is expected to lead to:

- (a) The inculcation of national consciousness and national entity.
- (b) The inculcation of the right type of values and attitudes for the survival of the individual and the Nigerian society.
- (c) The training of the mind in the understanding of the world.
- (d) The acquisition of appropriate skills and abilities both mental and physical, as equipment with which the individual lives and contributes to the development of the society (FRN, 1977).

Psacharopoulos (1985) added his voice, when he said that:

Human capital is created and quality of human input in production is significantly improved by spending on education. This is why countries, particularly those with low per capital incomes invest such large proportion of their budgets on education and why, when the state does not, individuals do.

Consequent upon the foregoing, substantial sums of money are earmarked in government annual budgets for the provision of educational services to the people. In Nigeria, for example, the Federal Government's capital and recurrent expenditures on education has being on the increase over the years, although characterized by periodic fluctuations. For instance, the Federal Government expenditures (i.e. recurrent and capital expenditures) rose from 26,721.3 million in 1998 to 31,563.8 million in 1999 and in 2005, it increased to 120,035.5 million. Besides, enrolments for the various levels of education have

increased tremendously. In this direction, primary school enrolment in Nigeria increased from 17,907,010 in 1999 to 19,158,439 and 19,384,814 in 2000 and 2001 respectively. (See tables 1 and 2 below for Federal Government expenditures and primary school enrolment respectively).

Table 1: Shows Federal Government Budget Estimates on Education (1998-2005) (₦ Million)

Year	Recurrent Expenditure	Capital Expenditure	Total
1998	13,928.3	12,793.0	26,721.3
1999	23,047.2	8,516.6	31,563.8
2000	44,225.5	23,342.6	67,568.1
2001	39,884.6	19,860.0	59,744.6
2002	100,240.2	9,215.0	109,455.2
2003	64,755.9	14,680.2	79,436.1
2004	72,217.9	21,550.0	93,767.9
2005	92,594.7	27,440.8	120,035.5

Computed from CBN Statistical Bulletin Vol. 16 December, 2005

Table 2: Shows Primary School Enrolment Trends by Geo-Political Zones (1999-2001)

Zone	1999	2000	2001
NW	3,744,959	4,023,809	4,049,894
NC	2,756,275	2,957,578	2,905,612
NE	3,327,840	3,613,879	4,020,095
SW	3,033,852	3,136,805	2,876,297
SS	2,915,114	3,187,336	3,267,509
SE	2,128,970	2,239,030	2,265,377
Total	17,907,010	19,158,439	19,384,814

Source: Federal Ministry of Education

It is fundamental to realize that other levels of education in different countries with particular reference to Nigeria, similarly witnessed tremendous increase in students enrolment over the years.

The inference that emerges from the increase in expenditures on education, coupled with increased enrolment at all levels of education; is that, individuals and society believe there are costs benefits from acquiring education. This brings us to the object of this unit, which centers on Cost-Benefit Analysis of Education. The unit discusses Education as an investment and as consumption, the nature of cost and benefit in education, cost-benefit analysis as an evaluative technique; its uses and shortcomings in developing countries, with reference to Nigeria.

EDUCATION AS AN INVESTMENT AND AS CONSUMPTION

An expenditure item is either an investment or consumption; depending on the economic agent that is making the decision. Consequently, an investment in education is analogous to an investment project; as an input into the productive system resulting in an increased flow of output (Griffin and Enos, 1970). Expenditures on education are therefore, made in an anticipation of higher monetary income or satisfaction in the future. Such expenditure may in this direction, be regarded as the foregoing of present income and satisfactions; in order to obtain an increase in the future of income and satisfaction. In line with this, Vaizey (1973), emphasized that, "it makes sense to look at what happens to educational expenditure as a process of investment which usually takes place over long periods of time to mature in the future welfare of a family, or of a society or nation."

On the other hand, consumption expenditures are associated with households. Since educational expenditures are made by households or by government acting on behalf of households out of taxes collected from them (Blang, 1980), education is clearly consumption.

In this direction, substantial part of consumption, is forward looking, involving the anticipated consumption of the services of a durable consumer good. Therefore, it is not surprising in the immediate past; much interest has centred on the concept of expenditures on education as a form of investment from

which benefits accrue in the future, both to individuals receiving education and to society as a whole (Morris and Ziderman, 1971).

Education as consumption refers to the belief that expenditures and activities in education are necessary because education is of immense benefit to the individual, society and for its own sake. In other words, education is good for every one as exemplified by the 1999 Constitution of the Federal Republic of Nigeria.

While investment in education refers to the belief that expenditure in education is necessary to provide benefits in future whose effects would ultimately offset the cost of the education.

EDUCATION IS A PRIVATE AND SOCIAL INVESTMENT

In other words, when education is perceived as an investment, it is hoped that education would give rise to increase in the productive capacity of the individuals and the society as a whole.

Consequent upon the fact that, education is characterized by the concepts of investment and consumption; it is of obvious importance to separately examine costs and benefits in education. This brings us to the nature of cost and benefit in education.

THE NATURE OF COST AND BENEFIT IN EDUCATION

The concept of cost is closely associated with the concepts of production, demand and supply of goods and services. Cost may be expressed in either monetary or non-monetary terms. Consequently, education like other producers is concerned with costs.

However, applying cost to education, unlike conventional producers is fraught with a number of problems. In support of this, Hallak (1969) emphasized that:

A closer look at the application of the concept of cost to education ... reveals three types of difficulty inherent in the very nature of the activity of education, and arising more particularly out of (a) the definition of the production of education; (b) the identification of the economic transactions concerned with education; and (c) the fact that education has the character of a public service.

In the same vein, Nwadiani (2000) asserted that, "in real terms, it is difficult to quantify the cost of education. Since there is a choice between alternatives in the utilization of money invested in education; cost in education is more than the amount spent in purchasing the service. Rather it is the opportunity cost forgone that constitute the cost of education."

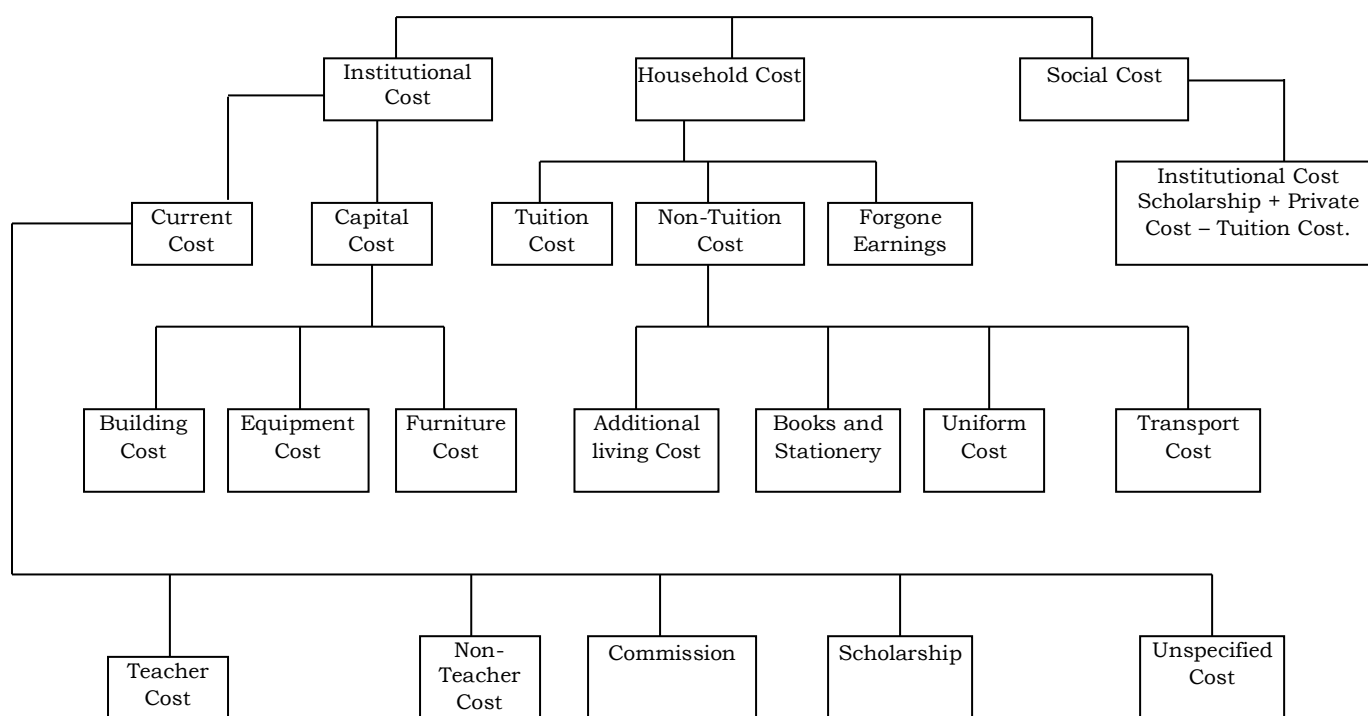
Consequent upon the foregoing, cost in education encompasses all the inputs in terms of human, fiscal and material resources, coupled with the time that were utilized in the education and or training of the recipients. In other words, it includes the direct expenditure in fiscal form by individuals and society, and the direct cost incurred by the suppliers and consumers of education service (Nwadiani, 1992a:43). While the indirect cost of education on the consumer (ie student) is the earnings forgone during the period of acquiring knowledge and/or skills. The nature of opportunity cost due to its relevance in the context of cost in education is discussed below.

OPPORTUNITY COST

On a general note, the opportunity cost of any good or service is the alternatives forgone. According to Mishan, (1975), "in general terms, the opportunity cost of the current use of some good or of some input is its worth in some alternative use." In other words, the opportunity cost of any level of type of education is the value of the income which students forgo, while acquiring (or purchasing) their education. Commenting on the relevance of opportunity cost in the context of education, Schultz (1960) and Bowman (1966) regard the opportunity cost to education as very significant because, such cost constitute well over half the private cost of education.

From the foregoing, costs in education include household or domestic cost, social cost and institutional costs as well as their respective components. This is illustrated by figure 1 below.

Figure 1: Shows the Various Types of Costs in Education



Source: Pandit (1981)

While benefit, refers to the addition to the flow of national or individual output accruing from an investment project. It could be an investment in primary education or any other level of education. An investment is beneficial to the extent it tends to increase the income or earning of the people; increase in income being measured by the actual increase in production and consumption. Just as there are various forms of costs, so also, there are various types of benefits. In other words, benefits may be direct and or indirect.

In the light of this, benefits of education may be direct as in the increase in the productivity or output of the educated person, and this is quantifiable; or indirect as in the non-monetary satisfaction derived from a particular education, and this is unquantifiable; as well as any spill-over effects which an individual's education may have on the rest of the society. In this direction, private benefits include the opportunity of the educated person to earn higher salary and allowances. In line with this, Blaug (1980), attempted to demonstrate the proposition that, "the amount of education an individual possesses is in all modern economies for which evidence is available, positively correlated with personal earnings". He further posited that, "additional education can be more or less confidently expected to raise life time earnings".

At this juncture, it is worth noting that, there are other factors that can influence personal earnings; such as place of residence, age and branch of employment amongst others. In support of this, Blaug (1980) emphasized that, "these, apart from age; are not powerful in their influence as the number of years of schooling completed". In a related development, Nwadiani (2000) asserted that, "economic benefits which are direct are reflected by the increase in the earnings of educated people as their output". While as regards non-economic benefits, Nwadiani (2000) emphasized that, "these forms of benefits are spill-in and spill-over in nature. They are benefits that individuals, families, neighbours, communities and society derive from investment in education."

Consequent upon the foregoing, one can conveniently say that investment in educations brings both monetary and non-monetary benefits to the recipients, families, community and society. This situation makes it imperative for us to consider costs and benefits in education side by side; so as to ascertain which outweighs the other.

Table 3: Cost-Benefit of Education

Costs in Education	Benefits in Education
What is the cost of resources (i.e. human, materials and fiscal) used at a particular level of education at a particular time?	What is the earning of the recipient before retirement? What is the earning of the recipient after retirement?
What is the cost of facilities i.e. buildings, laboratories and libraries amongst others; used for the education and or training of the recipient.	What are the benefits to the families, community and society of the education and or training received by the recipients?
What is the opportunity cost of the alternatives foregone?	What are the benefits in terms of title, position, new roles and recognition of the recipient?
What is the cost of the efforts made to surmount problems in the course of education and or training perceived?	What are the benefits associated with the value of education and or training received?

The answers to these questions amongst others; would enable us to ascertain whether the benefits of an investment in a particular level of education exceed the cost. In consonance with this, Scriven (1969:36) emphasized that, “no cost or needs can be justified without a reference to payoff”. Consequently, experience and the results of educational rate-of-return studies carried out in most developed and developing countries; are in favour of additional investment in education; which the studies show to be profitable both from the point of view of the national economy and from that of the individual student. This brings us to the criteria for Cost-Benefit Analysis (CBA).

CRITERIA FOR COST-BENEFIT ANALYSIS

Cost-Benefit Analysis (CBA) is an evaluative technique, which enables the decision makers to maximize the benefits for a given level of costs or to minimize costs for a given level of benefits. In other words, CBA has been for some years, a widely accepted technique, used to assess the profitability of an investment project; for instance the Universal Basic Education (UBE) project.

There are many criteria for CBA and these include:

- (i) $B - C$;
- (ii) $B - C/I$;
- (iii) $\Delta B/\Delta C$;
- (iv) B/C .

Where B and C refer to benefits and costs respectively, I refer to direct investment and Δ relates to incremental.

- (v) The Net Present Value (NPV) and
- (vi) The Internal Rate of Return (IRR)

It is worth noting that one of the best criteria for an investment evaluation is B/C . In this criterion, the benefit-cost ratio is the measure for the evaluation of an investment project. For instance, if B/C is equal to 1; the investment is marginal and it is just covering its costs. If B/C is greater than 1, the benefits are more than costs. If B/C is lesser than 1, the benefits are less than costs and the investment project cannot be undertaken.

The Net Present Value Criterion (NPV)

The NPV is an important criterion used for an investment evaluation. NPV is equal to the present value of benefits minus the present value of operating and maintenance costs minus initial outlay. This criterion in terms of benefits and costs is not a correct method for an investment project evaluation, because it ignores the time horizon. Therefore, future benefits and costs cannot be equated with present benefits and costs. Consequently, it becomes necessary to discount future benefits and costs of an investment project. The discount factor is expressed as:

$$D = \frac{1}{(1 + i)^t}$$

where: i is the social discount rate and t is the time period. Thus

$$NPV = \left[\frac{B_1}{(1+r)} + \frac{B_2}{(1+r)^2} + \dots + \frac{B_n}{(1+r)^n} - \left[\frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \dots + \frac{C_n}{(1+r)^n} \right] \right]$$

where $B_1, B_2 \dots B_n$ are series of gross present benefits in years 1, 2, ... n ; $C_1, C_2 \dots C_n$ are series of gross present costs in years 1, 2, ... n ; i is the social rate of discount for annual compounding. Only those investment projects in which the present value of benefits exceeds the present value of costs should be selected. Where symbolically

$$\left[\frac{B_1}{(1+r)} + \frac{B_2}{(1+r)^2} + \dots + \frac{B_n}{(1+r)^n} \right] > \left[\frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \dots + \frac{C_n}{(1+r)^n} \right]$$

The Internal Rate of Return (IRR) Criterion

The IRR relates to the discount rate at which the present value of return minus costs is equal to zero. The formula for the calculation of IRR is:

$$\frac{B_1 - C_1}{(1+r)} + \frac{B_2 - C_2}{(1+r)^2} + \dots + \frac{B_n - C_n}{(1+r)^n} = 0$$

where r is the internal rate of return.

However, it is worth noting that IRR has some shortcomings and the prominent ones are as follows:

- (i) Once a rate of return is assumed for the calculation of the profitability of an investment project, it is not possible to vary it.
- (ii) It is difficult to calculate the rate of return on a long gestation project, which does not yield benefits for a number of years.
- (iii) If projects are mutually exclusive, IRR favours that project which has a lower capital cost than others.
- (iv) The use of IRR for public investment does not lead to correct decisions.
- (v) IRR is only suitable for such investment projects, which are independent of others. (Jhingan, 2005).

This unit would not be complete if devoid of the relevance and limitations of CBA in developing countries like Nigeria.

THE RELEVANCE OF CBA IN DEVELOPING COUNTRIES

CBA has been used in many developed and developing countries of the world and some of the uses are as follows:

- (i) CBA helps in reducing differences in the marginal effectiveness of alternative measures.
- (ii) CBA is a practical means of assessing the desirability of investment projects.
- (iii) CBA can be used as a means of comparing alternative uses of resources in order to identify the most cost effective; for instance general education versus Technical and Vocational education.

Despite these advantages, the use of CBA in developing countries is characterized by the following difficulties.

- (i) CBA is based on the conditions of developed countries.
- (ii) The problem of obtaining reliable and accurate data.
- (iii) The difficulties in cost assessment, due to fluctuation in prices and shortage of resources amongst others.

CONCLUSION

In spite of the problems inherent in the use of CBA especially in the developing countries; CBA is an important element in decision making and it can be a useful tool for educational planners and administrators, which provides a conceptual framework for evaluating alternative proposals and generates investment signals in the form of rough estimates of the profitability of different types of education or different patterns of resource allocation. Consequently, the relevance of CBA education in contemporary times in developing economies, with many educational projects yawning for limited scarce resources cannot be over emphasized.

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