Global Perspectives in Education

A Book of Reading in Honour of

Late Prof. Mobolaji Ogunsanya

Edited by:
Akinwumi Femi Sunday
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E-mail: awemakin@gmail.com

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EFFICIENCY IN EDUCATION: A CONCEPTUAL DEFINITION OF AN UNFINISHED RESEARCH DEBATE

Isuku, E. J.
Department of Educational Management,
University of Ibadan, Ibadan, Nigeria.
Jeromeisuku72@gmail.com,
(+2348037283556)

Introduction

The concept of efficiency is arguably inexhaustible and is in most cases conceptualised from the individual area of professional and academic discipline. Generally, efficiency is defined as the relationship between inputs into a system or activity and the produced output from the system or activity. It is essentially a comparison between inputs that are used in the production or attainment of certain goods or activity and the output or outcome of the activity.

When, with a given amount of inputs or resources, a decision making unit (DMU) – be it a company, government establishment or a country, attains that level of output or outputs that is the maximum attainable under hand, it produces less than what it can possibly attain, the DMU is considered to be inefficient. In the economic balance, efficiency is attained at any point on the production possibility curve, while points below the PPC is said to be inefficient as recourses are not utilized maximally to achieve the desired outputs. In another term, efficiency refers to the ratio between inputs and outputs. A more efficient system is one which obtains more outputs for a given set of resource inputs, or that which achieves comparable levels of outputs for a fewer inputs, other things being equal. Thus efficiency also be seen is the measure of effectiveness that produces the minimum waste of time effort and skill. Efficiency can be understood as the cost per unit of a constant level of output. In measuring efficiency, efficiency is led fixed, while inputs (labour costs, material, equipment, etc.) are varied.

Some basic Concepts of Efficiency

Technical Efficiency: refers to the organization of available resources in such a way that maximum feasible output is produced (Levin and Radner 1996). This implies that no further or alternative rearrangement or organization of the available resources would be able to produce or yield greater output. A producer is said to be technically efficient if at a given level of production, it is possible to reduce any input, without at the same time reducing the level of output. An efficient system is that which enables a given output to be met at the lowest possible level of input or cost. A change in the relative price of inputs means that there will be a different combination of inputs for maximum efficiency to be achieved. (Marginson 1994). Technical efficiency is also known as productive efficiency which refers to a system or firm's costs of production that can be applied as both the short and long run. It is achieved when output is produced at the minimum average cost of the firm. Technical/Productive efficiency here implies:

i. The least cost of labour, capital and other resource inputs used.
ii. The best available technic/technology land the most efficient processes used in the production.
iii. Minimizing the wastage of resources in the production process.
iv. Exploiting economies of scale.

Allocative Efficiency: this is also referred to as price efficiency. It refers to the use of budget in such a way that, given relative prices, the most productive combination of resources is obtained. This implies that alternative combination of resources, given the budgetary constraint, wold enable organization to produce a higher of output (Levin and Radner 1996). Allocative efficiency is achieved when the value placed on goods by the consumer (reflected in the price they are willing to pay) equals the cost of the resources used up in the production of the good in question (i.e. Price = Marginal Cost). It also refers a situation where resources are allocated to the production of the goods and services most valued by the members of the society.

Social Efficiency: this refers to the maximization of social welfare or social benefit. This social efficiency is social welfare maximized. It is a situation where the social marginal benefit of production/consumption = Social marginal cost. This implies that the output obtained for any given budget must maximize social welfare.

Efficiency of Education Defined

Efficiency of education refers to the relationship between the output of the education system and the inputs used in producing such output. An educational system is efficient if it produces the maximum output possible with a given capacity of inputs or in the other hand when a given quality of only what is obtained with the minimum inputs possible. Efficiency is seen when the educational manager is able to satisfy the needs of the human elements (all stakeholders) within the system (Ajayi 2008). The stakeholders in this case include the learners, parents, consumers of educational output (employers of Labour), the community and the government. According to Oluchukwu 1999 in Ajayi 2008, efficiency of the school system is conceptualized as the relationship between the inputs (students, teachers and materials) into the school system and the outputs (graduated students, drop-out) from the school system.

Most often, the concept of efficiency in education which is borrowed from engineering equates it with wastage, that is, drop outs and repeater rate. Thus, for instance a university programme of four years is rated highly efficient if all the students who enrolled into year one successfully graduated at the end of the four year programme in exactly four years. On the other hand, a primary school system is rated inefficient if half of the pupils who entered primary one drop out before completing primary six, and if in addition, the average completer of the six year programme repeat along the way thereby taking eight years instead of the six years to finish the schooling cycle. This illustration implies that a school system without any drops out or repeater would be 100 percent efficient.

However, the illustration given may not be absolute in the educational system. If, for instance, it is possible for all the pupils/students to graduate or complete the schooling cycle within the given year, inefficiency could still occur if it were possible to combine resources that will enable the system to spend less to graduate the

students during the period in question. Similarly a school system that has no drop puts or repeaters can still be inefficient if the learning result it produces are very poor (see Coombs and Hallak 1987).

Need for Efficiency in Education

As the world struggles to accommodate the enormous growth in population as well as to manage the distribution of available scarce resources, the effort to make things more efficient has become increasingly more imperative and relevant. Both developed and developing countries are making efforts to find how available resources could be maximally distributed to the varying competing demands units within the society. In developing countries, there is a growing awareness of the importance of education for overall national development; consequently there is a tremendous expansion of educational facilities in the face of the rising demand for education at all levels. There is a rising pressure to increase educational budget which automatically necessitate the need to minimize wastage and increase output of the educational system. In the economic angle, efficiency in education is necessary in ensuring the best use of our scarce resources among the various competing ends so that economic and social welfare is maximised over time.

Efficiency: Some Conceptual Misconceptions

The efficiency concept in education is often confused with other related but distinct concepts such as; **productivity** and **effectiveness**. In some cases, the term is also confused with the concept of school quality. Very often, there is misconception in the interpretation of productivity in particular, and efficiency concept. Productivity and efficiency each refer to a different relationship between inputs and outputs in the formal education system. Inputs are the resources used (Money, Men, Material, Equipment, etc.) to produce output or product of education such as number of graduates from the different levels of education, cultural and life skills obtained from schooling etc.

Teglelass in Marginson 1994 identified three types of relationships between inputs and outputs in services production. First internal efficiency: the relationship between inputs and the production process. Secondly, the traditional productivity: the Relationship between the inputs and the outputs (consumer services), third, goal

satisfaction or effectiveness. These definitions are not exhaustive but they capture the different by each term is most often used.

Efficiency is concerned mainly with the internal cost of production process (see details in the types of educational efficiency). Productivity focuses more on outputs. It means output per time. Effectiveness refers to goal attainment. Productivity is best understood as output per unit of measured inputs. When comparing productivity, inputs are held constant while outputs are varied. Productivity increase when the same inputs lead to greater output than before. It can be measured either in monetary terms or in physical terms. Classically productivity is defined as the change in physical output per unit of labour or capital input. In productivity concept, input is held constant while inputs are varied. These two concepts should not be confused despite their technical relationships.

The distribution between efficiency and effectiveness is more understood based on the indicators of inputs and outputs. The inputs of the system determine whether the term "efficiency" or "effectiveness" is to be used. In most cases, non-monetary inputs imply effectiveness while monetary input implies efficiency. For instance, the non-monetary measurement can be in term of number of textbooks, class organization etc. (internally effective) while the monetary terms are measured in the form of cost of textbooks, teachers' salaries, etc. (internally effective) (Lockheed 1989)

Types of Educational Efficiency

Two major types of educational efficiency are often discussed and explained in the educational system production function. They are

Internal Efficiency and External Efficiency.

Internal efficiency of education

Internal efficiency of education refers to the relationship between output (learning achievements and the corresponding input that went into them. Economists of education and educational planners have always based the analysis of efficiency in education on the cost-effectiveness of inputs and the pedagogical assessment of the learning achieved. Hence, education internal efficiency, as perceived by Longe and Durosaro in Ajayi, (2008) emphasizes the extent to which the

education system is able to minimize cost and wastage resulting from repetition, dropouts and failures. Thus, educational efficiency, (internal efficiency) is generally based on cost at which output is optimized. For instance, if the student mean score in National examination is grade B in schools 1 and 2, if the score is achieved at a higher cost in school 1 than in school 2, it is concluded that school 2 is more efficient than school 1. However, this economic definition of the school internal efficiency is also debatable as process such as school policies, classroom management, teacher time utilization etc. which are equally important in assessing school efficiency are equally important in assessing school efficiency are not explained. However arriving at the best possible results is important, since the relationship between input costs and learning achievement is fundamental to evaluating the system's performance and compare with alternative approach.

Measurement of internal efficiency in education

In an attempt to assess the extent to which the school system is internally efficient, it should be noted that the main items of concern or consideration are the inputs and outputs variables. The internally efficient school is one which turns out graduates without dropouts and repeaters. To produce graduates from the school system, many inputs such as classrooms, teachers, furniture, textbooks, etc., which are usually qualified in monetary expenditure required per time't' usually a year. Thus, the basic unit of measurement of these inputs in education is therefore the student years.

There are different (but debated) ways of measuring the internal efficiency of the educational system, one of which is the more common is the cohort method. The cohort analysis is used to describe the history of a group of pupils/students entering school in class 1 together in a particular year and tracing (in modern balance tracking) them through the schooling cycle. This method of historical analysis is called the cohort analysis. The method will show the flow or progress pattern of the students throughout the educational cycle. For instance, it will take 9 years of basic education and 4 years of university education to successfully complete the above type of education under the condition of full maximum efficiency /other things being equal/. Maximum efficiency is attained if there is no wastage in the course or process of production. It is otherwise the ideal efficiency. For instance the ideal input-output ratio of a typical primary education system of 6 years will be achieved which the input-output ratio i.e. [input/output =

6/1 = 6] = Ideal. This implies a situation of absoluteness in 100 percent efficiency or zero-wastage of any sort. This situation is however practically impossible as there may never be 100 percent efficiency of a system. The educational system is definitely faced with the challenge of student dropout, repetition, etc. even in situation where there is automatic promotion policy; ideal efficiency is still unattainable as there could be instances of voluntary withdrawal from school or even incident of death. Thus, the actual number of student years and the total number of successful completers are used to determine the real or actual input-output ratio. That is,

Actual = input/output = Actual student year/Successful completes
In order to determine the level of efficiency of the educational system, the actual input-output ratio is related to the ideal input – output to obtain the level of wastage (wastage ratio) in the system. This is symbolically presented as:

Wastage Ratio = Actual Input – Output ratio/ Ideal Input – Output ratio.
In most cases, the standard of Perfect – (100%) efficiency (Ideal situation) is hardly achieved even in the most advanced countries, particularly at the lower levels of education. For instance, if the actual input – output ratio for a typical primary education of 6 year period is 9.80, the wastage ratio will be calculated as:
W = 9.0/6 = 1.5

This implies that the system is less efficient as the wastage ratio could not equal the ideal situation of 6 years rather it is greater than 1.
The wastage rate in education is used to measure the level or extent of efficiency of the educational system. Although, external efficiency of the educational system is difficult to quantitatively, the internal efficiency of the education system can be measured quantitatively. This is where the cohort analysis is useful. In order to express how efficient an educational system is, we find the inverse of the wastage rate. This is referred to as the "coefficient of efficiency", that is,

Coefficient of Efficiency CE = 1/W
The fraction in the given equation shows how the available educational resources have been efficiently utilized. For instance, with a fraction of 4/5 for a wastage rate of 5/4 or 1.2), we can conclude that such educational system is quite efficient or we can say that system is 80%

efficient. If on the other hand, the fraction is low (for instance ¼ of the wastage ratio is 4/1), the system is said to be inefficient or not efficient. The system is only 25% efficient. The coefficient of efficiency is an indicator for rating the extent or level of efficiency of the educational system.

A good knowledge of wastage measurement can help the educational cost analyst for instance to calculate the cost of educational wastage. One of the ways this can be done is to have adequate knowledge of the cost per school –child. This will help us to measure quantitatively (i.e. financial expenditure) the total amount a country's government may be losing when students are unable to complete a schooling cycle as at appropriate time either due to repletion or dropout problem.

The following steps/methods could be applied to determine the financial wastage of a country spending in education.

Step1: Find the number of student who successfully complete the schooling cycle.

Step2: Calculate the average number of student – year spent by the graduates.

Step3: Note the period/duration of the schooling cycle.

Step4: Find the actual cost of per graduate.

Step5: Calculate the cost per graduate under optimum efficiency.

Step6: Calculate the cost of wastage per graduate.

Step7: Calculate total cost of wastage.

In order to eliminate inefficiency in education, we need to formulate policies that will eliminate or at least minimise school drop-outs.

External Efficiency of education

Different experts in the field of education have provided different definitions to the concept of efficiency. However, there is a common agreement in terms of the input – output relationship as the measuring bases of both levels of efficiency. According to Longe (1985), efficiency in education is the capacity of the educational system to turn out its graduates with minimum wastages. It means that the relationship between the inputs into a system (such as agricultural, industrial, educational or health) systems and the output from that system (such as wheat, vehicles or educated individuals). An educational system is therefore said to be efficient if maximum output is obtained from a given input or a given output is achieved with a given input (UNESCO

www.u.s.unesco.org/i/pages/indspec/efficiency.htm 2009). There are however, two distinct forms of efficiency.

External efficiency in education means the extent to which the educational system outcome is able to match the real learning objectives and needs of both the students and the society with the available resources (Coombs & Hallak, 1987 in Isuku, 2011). It refers to the degree to which the output of the educational system (school graduates) is adapted to the needs of the economy and society. In other words, external efficiency, with the objective of social welfare maximization, can be judged by assessing the relationship between input and outcome. Thus by external efficiency analysis, we can justify the investment in education based on certain manpower demands or the higher social rate of return to investment in education than other alternatives. According to Psacharopoulos and Woodhall (1985), the choice of investment in education must be based on the analyses of external efficiency of all competing uses from the point of view society's objectives. The external efficiency measurement is a reason why government should invest in education if social externality (societal benefit) of education is considered. The external efficiency consideration affects the amount of public spending in education. Thus, it is possible for a system to be internally efficient but externally inefficient. For instance, it is common to see school graduates today who cannot express themselves correctly even though they have been certificated after completing the appropriate schooling cycle. This analysis is typically explained by the current trend in the Nigeria educational outputs at all levels where most of the products from our educational institutions are hardly employable. Even at a higher level of education degree, some graduates are unable to fit in to the world of work due to lack of appropriate and adequate knowledge, skill, behaviour and attitude which are measured by text examination scores etc. Clearly then, while internal efficiency is measured by output, external efficiency is measured by outcome. Outcome here is in the sense of the external effects of outputs i.e., the ability of the graduates to be socially and economically productive (World Bank, 1980)

Measures/Indicators of Educational Efficiency

Quality indicators should not be confused with efficiency indicators in this case with internal efficiency. An indicator points out or directs our attention to something. According to Johnstone (1981), an indicator is

something giving a broad indication of the state of the situation being investigated. A good indicator should consist of the following qualities:

i should provide useful information for policy makers
ii should summarize information without distortion
iii it usually precise and comparable
iv it reliability and frequency of updating
v it allow for relating with other indicators for global analysis
vi it measures how far or close one is from the objective
vii it helps to identify problematic or unacceptable situations
viii it meets policy concerns
ix it helps to compare its value to a reference value, to norm/standard or itself as computed to difference periods

The above-listed features of a good indicator define some of the common indices that usually determine to what extent a school system is internally efficient or not.

Below are some of the indicators of internal efficiency in a typical school system.

- Level of enrolment (at the different grades/age levels)
- Promotion rate
- Repetition rate
- Dropout rate
- Transition rate.(extent to which a particular level of education is able to produce for a higher level of education)

A high school enrolment at the different grade or age level in a country for instance, is a good indicator of the level of access that is achieved by the country and vice versa. Moreover, a fall in the dropout and repetition rates signals an increase in the level of internal efficiency of the school system.

However, it should be noted that all of these indicators can be measured in terms of the financial cost implication of achieving internal efficiency in education or otherwise. Thus monetary expenditure could serve as the measuring denominator to assess the level of the education system efficiency. Table 1 below shows some efficiency indicators that can be measured in terms of their financial implication on the educational system.

Table 1: Some indicators/ measures of efficiency in education

Output/Outcome	Measures/Indicators of Educational Efficiency
Enrolment	Cost per student enrolled
Increased enrolment	Cost per additional student enrolled
Literacy	Cost per student completing a grade level
raduate	Cost per student graduated
Achievement	Cost per student achieving at least some level of knowledge
Learning or Increase Achievement	Cost per additional knowledge or achievement gained

Source:

The level of internal and external efficiencies can both be improved by ensuring the availability of quality teachers, provision of adequate teaching and other pedagogical materials, availability of sufficient funds, effective leadership managerial know-how, provision of adequate physical facilities, relevant curriculum among other needs that would enhance a satisfactory educational service at the minimum wastage.

Conclusion

The issue of efficiency in education is germane as the management of the educational resources now needs more careful attention in the face of limited resources. Both government and the educational investors now demand a more prudent ways of managing the available input resources to produce the required educational output. Although, the concept of efficiency seems to have been confused with other related concepts such as productivity and effectiveness, the need to distinguish the concepts was discussed to give a better understanding about the concept. Nevertheless, the concept of efficiency in general and in education in particular is broad. Generally however, the major pursuit of the idea of efficiency in all organisations including education is to minimise wastages in the use of available resources while at the same time ensuring the maximum production of the goods or services in question. The massive competition for the limited financial resources in the educational system and other sectors in the economy is a reason why the issue of efficiency should continue to be researched in the educational parlance. Because the efficiency index helps us to know which of the education system deliver the best value for money?

References

Abagi, O & Odipo, G 1999. *Efficiency of Primary education in Kenya: Situational Analysis and Implication for educational Reform* Discussion paper no DP004/97. Institution of Policy Analysis and Research. House Nairobi, Kenya

Ajayi, A.I. 1998. Unit Cost of Secondary Education and Students' Academic Achievement in Ondo State, Nigeria (1991-1995). *Unpublished Ph.D Thesis. Department of Educational Management, University of Ibadan.*

Bakija, J. 2014. Social Welfare, Redistribution, and Tradeoff between Efficiency and Equity, with Developing Country Applications web.williams.edu.>economic >bakija Retrieved February, 2016

Chapman, D.W.and Windham, D.M. 1986. Improving the Efficiency of the Educational System.. *The Evolution of efficiency in Educational Development Activities* United States Agency for international Development. Pdf.usaid.gov>pdf_docs>PNABB661 February, 2016

Coombs, P.H. & Hallak, J. 1987. *Cost Analysis in Education. A Tool for Policy and learning.* International Bank for Reconstruction and Development, The World Bank

Isuku, E.J. 2011. Size Factors as Determinants of Recurrent Unit Cost of Public Secondary Schools in Edo State, Nigeria. *Unpublished Ph.D Thesis, Department of Educational Management, University of Ibadan, Nigeria*

Levin H. M. 1995. Cost Effectiveness Analysis. *International Encyclopedia of Economics of Education* 2;ed. Edited by Martin Carnoy: Oxford; Pergamon: pp 381-386

Levin, H.M; Jamison, D.T;and Radner, R. 1976. Concept of Efficiency and Educational production. *http://www.nberorg.chapters/c 4491* pp 149 –148 National Bureau of Economic Research. Retrieved March, 2016

Margison, S. 1991. Productivity and Efficiency in Education. *Australia journal of education 35(2) 201 -214*

Melhta, A.C. 2004. *Indicators of Educational Development with focus on Elementary Education: Concepts and definitions.* – Modules on indicators for educational Development www.education forallinindia.com. December, 2015

Seiler, M.F., Ewalt, J.A., Jones, J.T., Landy, B; Olds, S and Young P 2013. Indicators of Efficiency and Effectiveness in Elementary and Secondary Education Spending. *Research Report No. 338.* Legislative Research Commission, Frankfort, Kentucky.*www. e.achives.ky.gov>pubs>ERC* Retrieved January, 2016

Winkler, D. and Sondergaard, L. 2008. The Efficiency of Public Education in Uganda. *Ministry of Education and Sports, Kampala, Uganda*

Yin, H and Wang, Feng (n.d) A Review of External and Internal Efficiency Consideration in public Subsidization of Education. Faculty. mu.edu.sa>download