Determining the Cost of Adequate Education: A Critical Review of the Approaches

R. Ramesh Rao (Corresponding author)
Faculty of Economics & Administration
University Malaya
50603 Kuala Lumpur
Malaysia
Tel: 60-17-879-2159 E-mail: rameshdivan@yahoo.com

R. Sivabala Naidu
School of Humanities
Universiti Sains Malaysia
11800 Minden, Penang
Malaysia
Tel: 60-12-4824230 E-mail: sivabala27@gmail.com

Rohana Jani
Department of Applied Statistics
Faculty of Economics & Administration
University Malaya
50603 Kuala Lumpur
Malaysia
Tel: 60-3-79673747 E-mail: janir59@yahoo.com

Abstract

Education plays a pivotal role in nation building. As such, it is only natural that a large portion of a country's annual budget is allocated to this sector. However, policy and decision makers in the education system often find the task of determining the cost of education a tedious and difficult process. This is, in part, due to the complexity of education systems and the large number of stakeholders involved. Thus, it is the purpose of this paper to provide an overview of the term 'adequate education' and subsequently critically review the various methods that are currently utilized worldwide to determine the cost of adequate education. In doing so, the paper attempts to compare and contrast the various methods in an objective manner by identifying and evaluating the major advantages and disadvantages of each method.

Keywords: Adequacy, Education cost

1. Introduction

Education plays a crucial role in nation building. Thus, it comes as no surprise that many developing countries are allocating more funds to improve the education sector. However, it ought to be noted that an increase in the amount of funding may not necessarily yield the desired outcome. What is more important is how the funding is utilized effectively by the various stakeholders in the system so that the students gain adequately from the system and reap the benefits.

This raises the following question: How much is enough? In the context of education, it is often linked to the concepts *adequate* and *adequacy* which will be used interchangeably in the context of this paper. Basically, this paper discusses the concepts thoroughly in an attempt to provide a succinct definition of the terms, followed by a review of the methods that are currently used to compute the cost of *adequate education*.

2. Relationship between adequate and cost

2.1 Adequate

There are several definitions for the term *adequacy* that are relevant in the context of this paper, depending on the perspective that one is taking. For example, if adequacy is regarded as "input based" (Myersk and Silverstein, 2002), it refers to the number of teachers required to perform a certain task or tasks using a specific type of resource. On the other hand, Haveman (2004) defines adequacy as the achievement of certain state test scores standards. Adequacy has also been viewed from the constitutional aspect (for example in Kentucky, United States) which focuses on a set of specific skills that a student should obtain during his formal education years while studying in educational institutions. Basically, the skills that a student ought to acquire are reading, writing, and mathematical skills, Apart from these skills, students should gain sufficient knowledge of their culture and heritage and the economic, social and political systems that would enable them to become productive citizens in the future (Reschovsky & Imazeki (1999).

2.2 Cost of education

Cost of education refers to the minimum amount of expenditure or outlay needed to produce students with a projected level of achievement, considered as adequate. In other words, the least amount of money that needs to be spent to achieve the desired level of outcome is what scholars generally regard as the cost of education (see Andrews, Duncombe & Yinger, 2002 and Reschovsky and Imazeki, 1999). Based on the above two views, this paper views cost of education as the value of resources needed to produce any given level of output or the minimum amount of expenditure or outlay needed to produce a given level of student achievement.

3. Methods of determining Cost of adequate education

There are several methods which can be used to determine the cost of an adequate education. They are:

3.1 Professional Judgement Approach / Resource Cost Model (Downes, 2004; Odden, 2003; Harris, 2004; and Duncombe and Lukemeyer, 2002).

3.2 Cost Function Approach / Statistical Approach (Downes, 2004; Odden, 2003; Harris, 2004; Duncombe and Lukemeyer, 2002; Augenblick and Myers Inc, 2003; Myers and Silverstein, 2002; and Reschovsky and Imazeki, 1999)

3.3 Empirical Identification Approach / Evidence Based Approach / Effective School Approach / Successful District Approach (Downes, 2004; Duncombe and Lukemeyer, 2002; Odden, 2003; Harris, 2004; Verstegen, 2003; and Myers and Silverstein, 2002)

3.4 Whole School Design Method / Costing Comprehensive School Reform Models (CSR) / Comprehensive School Reform Research Based Models (Downes, 2004; Verstegen, 2003; Augenblick and Myers Inc, 2003; Myers and Silverstein, 2002; and Chamber, Parrish, Smith and Guthrie, 2004)

3.1 Professional Judgement Approach

In this approach, individuals who are directly involved in teaching (teachers in particular) are called upon to work out the cost of education. In this case, since teachers are the people who are actually responsible to educate the students, Augenblick and Myers (2003) argue that hey would be best placed to realize the resources needed both in terms of quantity and quality.

So, scholars such as Fowler (1998) have indicated that it would be ideal to get teachers to describe in detail the kind of delivery systems that should be made available in educational institutions such as the counseling services or non-personnel resources to cater for students across different areas and institutions. In other words, the teachers would make the final decision on the kind of resources and support services they would need to provide adequate education to the students. Once these resources are identified, they are priced according to the existing market value (Verstegen, 2003), which in turn makes it easier to estimate the cost of education.

Many decision makers involved in education prefer to use this method in determining the cost of education for the following reasons:

(i)It is easier to understand and implement compared to other methods (Myers and Silverstein, 2002)

(ii)It reflects the views of the actual service providers (i.e. the teachers).

However, researchers generally do not favor this method to determine the cost of education for several reasons as indicated below.

i)Duncombe and Lukemeyer (2002) argue that the outcome of cost is dependent on the preferences of a particular group of professionals, which may not be coherent with the opinion of the other stakeholders in the education

system. For instance, a teacher may feel that the use of white boards will be better than chalk boards because they are easier to use and clean. An administrator, however, might opine that chalk boards are better because they are relatively cheaper to maintain compared to white boards (also see, Verstegen, 2003; Augenblick and Myers, 2003; Myers and Silverstein 2002).

ii) Most of the findings or recommendations made are based on current practices in education rather than anticipated or projected needs for the future scenario (Verstegen, 2003; Augenblick and Myers, 2003; Myers and Silverstein, 2002). Basically, this method tends to ignore the dynamic nature of the education system, thereby either hindering or ignoring any research and development in the area.

iii) The outcome depends on the experience of the professionals i.e. teaching experience is a crucial factor drawn upon by the professionals in their decision making process (Duncombe and Lukemeyer, 2002). Hence, the experience of the decision makers which is usually wide and varied has a direct relation to the outcome. This may cause problems in determining the cost of education on a wider scale. For example, the types of resources needed by rural teachers may differ completely from those teaching in urban areas and result in a mismatch.

(iv) Since experience plays an important role, the panel of decision-makers may rely on the element of guessing in their decision making process (Verstegen, 2003).

(v) The amount of money allocated for education is limited. However in this method, the professionals may be under the 'impression' that the financial allocation is unlimited, thus the aspect of budget constraint may be overlooked.

(vi) Currently, educational strategies and components do not seem to have a clear link with actual students' performance level (Odden, 2003; Duncombe and Lukemeyer, 2002). This view is concurrent with Peyser and Costrell's (2004) claim that concerted attempts have not been made to link observed spending levels to actual student outcomes which undermines the credibility of this approach. Therefore, more research in this area to determine specifically how the money spent on resources has a direct influence on the outcome in terms of students' performance level should be conducted as proposed by Verstegen (2003)

(vii) This method focuses more on the consumption of the resources than the actual expenditure incurred, making the task of estimating the cost of an adequate education difficult (Odden, Archibald, Fermanich and Gross, 2002)

3.2 Cost Function Approach

This approach which focuses on an aspect called cost function allows one to quantify the relationship between per-pupil spending for education, student performance, various student characteristics, and the economic and spatial characteristics of school districts (Imazeki & Reschovsky, 2004). One advantage of this approach is that it takes into consideration the influence of variables such as the setting of the school i.e. rural or urban, etc. (Taylor and Keller, 2002). Similarly, Fowler (1998) stakes a claim that researchers applying this method of analysis would be able to include the differences in input prices across various locations. For example the price of educational resource, such as teaching aids is not the same across a particularly country.

In addition to the above advantage, this method also takes into account the patterns of input substitution that occur in response to differences in relative prices and differences in the technology requirements associated with pupil needs. In relation to this argument, this paper opines that students from the urban areas are likely to be more exposed to sophisticated technological advances than students from rural areas. Hence, it is highly likely that rural students resort to the 3½ floppy disk to save their data compared to students from the urban areas who may own more advanced hardware such as a CD-burner and so on.

Apart from the above, this method is more superior as it not only considers the input, i.e. the cost, but also the outcome of the input or specifically the students' achievement in relation to the expenditure incurred. If a student's achievement in an exam is used as the yardstick, then it would be possible to link these two aspects to determine the cost of the adequacy via this method.

Researchers using this approach generally consider all the following variables in determining the adequate cost of education:

(i)District expenditure

(ii)Educational outcomes

(iii) School Size

(iv)Input prices such as teachers, administrators, auxiliary personnel and computer equipment & instructional equipment

(v)Environmental Factors such as range of students, and family and neighborhood characteristics.

(vi)Capital

(vii)Geography or location of school

(viii)Efficiency of the school (Gronberg, Jansen, Taylor & Booker ,2004)

The above variables do not ensure validity and reliability of the results, thus, it is equally important to determine the achievement standard and the acceptable (tolerable) level of inefficiency. By using the data, the cost index for each school can be calculated by dividing the predicted spending level for each district to the predicted spending level in a district with average characteristics.

3.3 Empirical Identification Approach

According to Augenblick and Myers (2003), this is a viable approach in situations where the objectives are well laid and specified by the school or other stakeholders such as the district or state educational departments. In relation to this criterion, schools that will serve as good models for research will be schools which have met the specified objectives. Usually, a minimum level of test achievements is used as the yardstick (Duncombe and Lukemeyer 2002).

Augenblick and Myers (2003) suggest a 3-step procedure in this approach. The steps are:

Step 1: A set of schools are selected which have met the state standards. Duncombe and Lukemeyer (2002) have used the weighted average of the 4^{th} and 8^{th} grades in Mathematics and English Test as the state standards. In countries which have national exams such as Malaysia, the passing rate in these exams could be used as the state standard.

Step 2: The total expenditure of the school is utilized to calculate the cost.

Step 3: A base cost figure using the basic expenditure figure is calculated.

According to Harris (2004) and Verstegen (2003), this approach is very concrete and objective as it enables non-school factors like family background to be included in determining the cost. Furthermore, its effectiveness stems from the fact that the outcome of this method is actually based on actual evidence (Myers and Silverstein, 2002) and therefore does not require further testing on its applicability.

The main weakness, however, is that schools which have outcomes or achievement beyond the norm are omitted. Thus, Verstegen (2003) questions the validity of this approach because it does not include these 'outliers' school in the process of computing the cost. In addition, Peyser and Costrell (2004) have questioned the practicality of this approach as they believe that it would be time-consuming to include the data of every student in the education system to compute the cost. In fact, it would be improbable to use this method in countries with a large student population like Indonesia, India or China.

Another weakness of this method is that the exact breakdown on how the selected schools have spent their money is often left out, instead only the average basic expenditure is provided (Augenblick and Myers, 2003).

3.4 Whole School Design Method

In this approach, a few schools are selected randomly to participate in an educational program. At the end of the program, the outcome of the program will be evaluated. The school which performs the best in the program will be selected to become the benchmark for the other schools to follow in the future.

The main criticism of this approach is that the schools selected are selected randomly and thus, may not be a proper representation of the whole nation or a particular sector. In addition, there is also a tendency to eliminate the highest and lowest spending schools from the analysis in this method. This tendency has been noted by Odden, (2003) who claims that schools from large districts and urban schools are often not selected to take part in the program, thus raising questions pertaining to the validity of this approach.

4. Conclusion

There is no doubt that determining adequate education and its cost is an important process that cuts across all nations, both developed and developing. In acknowledging that there are strengths and weaknesses in all the methods reviewed above, this paper believes that the stakeholders involved in the process must take every effort to choose the most practical method, in relation to the situation in their respective countries. If the situation permits, it would be ideal (though not practical) to estimate the cost in a more localized basis such as within particular districts as it is only natural that the cost of adequate education varies from place to place. However, it must also be noted that research acknowledge that more spending alone won't result in greater performance. What is more important is whether the money is spent wisely. In line with this argument, perhaps, what is needed is not more funding for schools which do not provide an adequate education, but a transformation of the system so that there is good governance all around to ensure better quality and greater efficiency in schools.

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