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Research Article

EDUCATIONAL LEADERS ANALYZE OF COST-EFFECTIVENESS, EQUITY AND EFFICIENCY IN THE USE OF PUBLIC FUNDING FOR EDUCATION

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Abstract
Funding the education promoting an effective, efficient and equitable use of resources. This paper attempts to identify the roles of educational leaders in analyze cost-effectiveness, equity and efficiency in the use of public funding for education. In this paper leaders need to identify the available resources for education, as well as true allocation of resources of education, guide the investing of education in the right track, looking for alternatives for funding education, and setting the priorities in achieving specific goals. Educational leaders need to understand the diversity in students have diverse needs, also how meeting these needs with the school budget, as well as how the resources are distributed to ensure equal opportunity across students. Besides, educational leaders need to mobilize financial resources for education, and know the best way to allocate the scarce resources to meet the desired goals.

Keywords: Cost-effectiveness, Education Policy, Efficiency, Equity, Leadership

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INTRODUCTION

Education is typically conceptualized as a process turning a given set of resources into a given set of outcomes. Thus, schooling is the transformation of resources (e.g. students' and teachers' characteristics, classroom size, or schools' facilities) into individual (e.g. improved cognitive skills, successful integration in the labor market or individual wellbeing) and social outcomes (e.g. increased democratic participation, intergenerational mobility or social

cohesion). This process is mediated by the institutional factors shaped by educational policy (e.g. decentralization of school funding, higher school autonomy or benchmarking between schools) and broader national policies and governance structures (OECD, 2017). Funding the education promoting an effective, efficient and equitable use of resources. So, educational effectiveness refers to the potential of a particular combination of school resources to provide desired outcomes. Effective schools or school systems are those able to adequately accomplish stated education objectives, producing the maximum possible outcomes by using available human and physical resources (OECD, 2017).

Cost-effectiveness analysis was developed in the 1950s by the United States Department of Defense as a device for adjudicating among the demands of the various branches of the armed services for increasingly costly weapons systems with different levels of performance and overlapping missions. By the 1960s it had become widely used as a tool for analyzing the efficiency of alternative government programs outside of the military, although its applications to educational decisions have been much slower to develop. Indeed, in the early 1990s the use of the tool in considering educational resource allocation is restricted largely to the United States and has not emerged as a decision approach to resource allocation in other countries (Levin, 1995).

On the other hand, efficiency is important for many discussions about educational policy and economics of education. Discussions on efficiency in education are not new and can be traced back to the famous Coleman-report from 1966. The aims the essay is to clarify the concept and sketches how the concept has been used in studies on the educational production function (Webbink, 2012). Improving the efficiency of a school or school system can be attained in two ways: either by maintaining identical levels of outcomes while lowering the amount of school funding, or by attaining better outcomes with the same level of funding (OECD, 2017). Furthermore, educational equity is becoming a social and political issue in many countries around the world, which concerns with the distribution of resources and is inevitably linked with concepts of fairness and social justice (Bejakovic and Meinardus, 2011). Funding equity in educational services means all school districts receive funding based on an equalized basis to provide a solid education for their students (Warmuth and O'Neill, 2012). Therefore, this paper attempts to identify the ways educational leaders analyze the cost-effectiveness, equity and efficiency in the use of public funding for education.

RESEARCH METHOD

This paper is a qualitative research method. Information gathered for this paper was collected from the online library (Z-library), scholarly journals and books. In addition, the electronic databases used to obtain information to conduct this literature review included: ERIC, SAGE, ProQuest, and Google Scholar.

RESULTS AND DISCUSSION

Cost-effectiveness analysis

The concept of effectiveness can be defined as the ratio between the result achieved and the programmed one and shows the success acquired by using the resources to accomplish the proposed objectives (Mandl, Dierx and Ilzkovitz, 2008). Effectiveness (of a program or service), a measure of how well the outputs of a program or service achieve the stated objectives (desired outcomes) of that program or service (Australian Government Productivity Commission, 2013). Thus, educational effectiveness refers to the ability of a school or school system to adequately accomplish stated education objectives. Studies of educational effectiveness analyze whether specific resource inputs have positive effects on outputs, and if so, how large these effects are however, effectiveness analyses are not necessarily concerned

with money and the cost of different inputs (Bruneforth, Chabera, Vogtenhuber, and Lassnigg, 2015).

Cost effectiveness analysis (CEA) means compares the unit costs of various policies targeting one particular outcome. It does not require benefits expressed in monetary terms because it deals with one outcome only. Therefore, CEA does not require translating benefits into an equivalent in monetary terms (Münich and Psacharopoulos, 2014). Cost effectiveness does not mean just budget cutting, it also means increasing productivity through parallel attention to cost management and performance:

1. By reducing spending strategically in areas that are least damaging to access and attainment;
2. by increasing the proportion of students who complete degrees, and reducing the production costs (such as credits to the degree) required to obtain the degree; and
3. By reinvesting in core academic capacity, to put cost savings into areas that are strategic priorities for the institution (Chaffee, E., & Wellman, J, p.6).

Cost-effectiveness analysis is an aid in decision making about resource allocations and, therefore, requires that there be alternative programs for comparison (Comparators). The easiest comparisons to make at the school level are with existing programs. Reasonable alternatives should also be considered. For example, comparators for literacy programs serving students at risk for literacy problems might include classroom instruction, small group instruction, one-to-one tutoring, grade retention, and special education placement (Hummel-Rossi and Ashdown, 2002). So, cost-effectiveness analysis assists policy-makers in setting priorities among a proposed group of interventions on the basis of their efficiency in resource use at achieving a specific outcome (Belfield and Levin, 2013).

Cost-effectiveness analysis compares two or more educational programs according to their effectiveness and costs in accomplishing a particular objective (e.g., raising student mathematics achievement). By combining information on effectiveness and costs, the evaluator can determine which program provides a given level of effectiveness at the lowest cost or, conversely, which program provides the highest level of effectiveness for a given cost. Cost-effectiveness analysis is a fundamentally comparative endeavor. That is, it allows us to choose which of two or more alternatives is relatively more cost-effective, but it does not tell us whether an alternative is worthwhile in some absolute sense (Levin, 1988).

Cost-effectiveness analysis refers to the consideration of decision alternatives in which both their costs and consequences are taken into account in a systematic way. It is a decision oriented tool, in that it is designed to ascertain which means of attaining particular educational goals are most efficient. For example, there are many alternative approaches for pursuing such goals as raising reading or mathematics achievement. These include the adoption of new materials or curriculum, teacher training, educational television, computer-assisted instruction, smaller class sizes, and so on. The cost effective solution to this challenge is to ascertain the costs and effects on reading or mathematics achievement of each alternative and to choose that alternative which has the greatest impact on raising achievement scores for any given resource outlay. Cost-effectiveness analysis is closely related to cost-benefit analysis in that both represent economic evaluations of alternative resource use and measure costs in the same way (Levin, 1995). A cost−effectiveness analysis (CEA) seeks to find the best alternative activity, process, or intervention that minimizes resource use to achieve a desired result. In CEA, incremental effects are expressed in non-monetary units. In education, the effects may include quantity measures such as school enrolment, attendance, completion, or overall years or degrees attained; and quality measures such as cognitive development, academic achievement, or non-cognitive skills (McEwan, 2012).

Measuring Cost-effectiveness

The basic technique has been to derive results for educational effectiveness of each alternative by using standard evaluation procedures or studies and to combine such information with cost data that are derived from the ingredients approach. The ingredients approach was developed to provide a systematic way for evaluators to estimate the costs of social interventions. It has been applied not only to cost-effectiveness problems, but also to determining the costs of different educational programs for state and local planning:

1. *Assessing Effectiveness*

Before starting the cost analysis, it is necessary to know what the decision problem is, how to measure effectiveness, which alternatives are being considered and what their effects are. If a problem has risen on the policy agenda that requires a response, a careful understanding of the problem is crucial to addressing its solution (Levin, 1983). Once the problem has been formulated, it will be necessary to consider how to assess the effectiveness of alternatives. For this purpose, clear dimensions and measures of effectiveness will be needed. Given the problem and criteria for assessing the effectiveness of proposed solutions, it is necessary to formulate alternative programs or interventions, the search for such interventions should be as wide-ranging and creative as possible. It is important to emphasize that the evaluation of effectiveness is separable from the evaluation of costs.

2. *Cost Estimation*

The most common measure of cost-effectiveness is the cost-effectiveness ratio, namely, the effectiveness of an alternative divided by its cost. When this is done for each alternative, it is possible to see which of the alternatives yields the best outcomes per unit of cost. For example, one might wish to examine different alternatives for raising student achievement by comparing the cost per additional achievement gains. In principle, the alternative with the lowest cost per achievement gain would be the most desirable. However, it is important to know if differences in cost-effectiveness ratios are large or small. If the differences are small, it is probably wise to weigh more fully other criteria in making the decision such as the ease of implementation or previous experience of staff. If the differences in cost-effectiveness are large, it is important to place greater weight on the cost-effectiveness criteria while still considering other factors that were not considered in the analysis (Levin, 1995).

The cost-effectiveness ratio (CER) is derived by dividing the incremental cost of each program by the probable impact (effectiveness). Usually, the program with the least CER is considered to be the program with the least cost and reasonable impact on beneficiaries (Uneze and Tajudeen, 2013).

CE is a ratio of program effectiveness to program costs.

Therefore, cost-effectiveness analysis is useful when (Zeitlin, 2014):

1. You have a specific outcome measure you want to affect.
2. There are many possible interventions to address this goal, and you are unsure which will get the most impact at the least cost.
3. You want to demonstrate that a non-obvious program is a good idea.
4. Shows comparative effectiveness that would be difficult to predict from theory.
5. You want to understand how the CE of a program could vary with contextual and implementation factors.

Strengths and weaknesses of CEA

The CEA can be as seen as having two main strengths (European Union, 2013):

- First, it does not require benefits to be defined in monetary terms. Indeed, decision-makers are free to determine whatever measurement of benefits that they believe credibly reflects the objectives of the intervention.
- Second, CEA can be used to compare alternatives that are expected to have more or less the same outcome. It can thus be used to compare interventions that are very different in nature or scale.

At the same time, CEA can be seen as having four main limitations:

- First, it requires detailed data to be available about both the costs and the effects of a measure. The format of such data must also be consistent between different options or projects under consideration.
- Second, the technique itself is not applicable to many types of spending measures. It has limited applicability to measures that feature multiple objectives and/or that produce a diverse set of effects or effects that are not easily quantifiable.
- Third, the results of CEA – even when properly applied – may be limited and thus risk being misleading.
- Fourth, any measure of cost-effectiveness risks being misleading where a linear scale is applied to an effect that is not linear in nature, such that twice the effect does not necessarily produces twice the benefit.

Equity

Equity "refers to the effects of a public policy on the fairness of the distribution of benefits and costs to society (Dowd and Shieh, 2013). So achieving equity depends on how public resources are dis¬tributed and on who gains and losses from that distribution. Equity in school finance relates to meeting the needs of diverse learner groups through school budget planning and management, and how complementing and supplementing public resources with household and private resources influence equity (UNESCO, 2017). A focus on equity takes into consideration the varying personal experiences and social identifiers that impact students' educational opportunities, including race, gender, ethnicity, socioeconomic status, disability, family background and others. To address these inequities, education leaders must first understand that diverse students have diverse needs. States have the power to advance educational equity by targeting resources and crafting policy that challenge the status quo (Atchison, Diffey, Rafa, and Sarubbi, 2017).

Equity is different from equality. According to Opheim (2004), educational equity refers to an educational and learning environment in which individuals can consider options and make choices throughout their lives based on their abilities and talents, not on the basis of stereotypes, biased expectations or discrimination. Educational equality as the same educational opportunities must be available to equally talented individuals with the same willingness to make an effort to acquire the necessary skills and qualifications (Zhang, 2016). Educational equality means that all students receive equal access to the same educational pathways. While this is a laudable goal, simply leveling the field is not enough. States should strive for equity in educational opportunities, providing all students with the unique supports they need to succeed (Atchison, Diffey, Rafa, and Sarubbi, 2017).

The pursuit of equity in education usually takes into account three different possible strategies underpinning policymaking: seeking equal opportunities, equal treatment or equal results across students and schools (OECD, 2017).

Dimensions of equity

Equity in education has two dimensions:

- The first is fairness, which basically means implies that personal or socio-economic circumstances, such as gender, ethnic origin or family background, are not obstacles to success in education (Schleicher, 2014).
- The second is inclusion, in other words ensuring a basic minimum standard of education for all – for example that everyone should be able to read, write and do simple arithmetic (Policy Brief, 2008).

The two dimensions are closely intertwined: tackling school failure helps to overcome the effects of social deprivation which often causes school failure.

The importance of equity

Equity in education is important for several reasons (Levin, 2003):

1. There are surely human rights imperative for all people to have a reasonable opportunity to develop their capacities and to participate fully in society. The right to education is recognized, for example, in the United Nations Declaration on the Rights of the Child.
2. Insofar as opportunity is not distributed fairly there will be an underutilization of talent; some people will not develop their skills and abilities with consequent loss not only to them but to the society generally. We cannot know how many outstanding scientists, writers, artists, or teachers are lost because a significant number of people are not able to obtain the necessary learning.
3. Higher levels of education are associated with almost every positive life outcome – not only with improved employment and earnings but also with health, longevity, successful parenting, civic participation, and so on. Insofar as societies contain significant numbers of people without adequate skills to participate socially and economically, there will be higher social costs for security, health, income support, child welfare, and so on.
4. Social cohesion, or trust, is itself an important factor supporting successful countries. Greater inequality is associated with lower levels of social cohesion and trust, thus hampering countries' capacities in many areas.

Efficiency

The concept of efficiency is central to the models and techniques proposed by economists (Helmut Wenzel, 2008). Efficiency is achieving the most, the best, or the most preferable public services for available resources (UNESCO, 2017). Weimer and Vining define efficiency as maximizing the total value to the members of society obtained from the use of scarce resources (Weimer and Vining, 2009). Efficiency of school finance refers to ways of mobilizing financial resources and their efficient management to provide effective education services at the lowest cost (UNESCO, 2017). Most studies define efficiency as obtaining the maximum possible performance for any given expenditure of resources. School finance research attempts to study two things: the feasibility of obtaining better performance with existing resources; and the possible improvements to performance that could be made with changes in expenditure levels (Seiler, M. F., Ewalt, Jones, Landy, Olds, and Young, 2006).

Educational efficiency refers to the achievement of stated education objectives at the lowest possible cost. In other words, efficiency is effectiveness plus the additional requirement that this is achieved in the least expensive manner (Scheerens, 2000). A more efficient school or school system achieves better outputs for a given set of resources, or it achieves comparable outputs using fewer resources. In order to analyze efficiency, it is necessary to have information regarding the cost of inputs (Bruneforth, Chabera, Vogtenhuber, and Lassnigg, 2015).

The relationship between efficiency and effectiveness

The effectiveness and efficiency of public spending indicate that the efficiency and effectiveness analysis is based on the relationship between the inputs (entries), the outputs (results) and the outcomes (effects) (Mihaiu, Opreana, and Cristescu, 2010). In the following, we will illustrate this relationship:

- Efficiency is not the same as effectiveness. Efficiency is relating to 'how well an activity or operation is performed.' Effectiveness relates to performing the correct activity or operation. In other words, efficiency measures how well an organization does what it does, but effectiveness raises value questions about what the organization should be doing in the first place (Kenny, 2008).

- While efficiency derives from a relationship between inputs and outputs, and refers essentially to the extent to which outputs are attained while minimizing production costs, effectiveness refers, in our view, to the connection between inputs, outputs and more general, second layer type objectives or outcomes (Aubyn, Garcia, and Pais, 2009).
- The effectiveness refers to the "achievement of the final aim" while efficiency "measures the quality" (Kjurchiski, 2014).
- The efficiency is an indicator that is obtained by reporting the outcome effects to the efforts made. The efficiency of public expenses implies a relation between the economic and social effects resulted from implementing a program and the effort made to finance that program. The effectiveness is the indicator given by the ratio of the result obtained to the one programmed to achieve. Peter Drucker believes that there is no efficiency without effectiveness, because it is more important to do well what you have proposed (the effectiveness) than do well something else that was not necessarily concerned. The relationship between efficiency and effectiveness is that of a part to the whole, the effectiveness is a necessary condition to achieving efficiency (Mihaiu, Opreana, and Cristescu, 2010).

Types of efficiency

1. Internal efficiency: the internal efficiency of education refers to a comparison of learning (a non-monetary outcome of education) to the costs of educational inputs; the analysis typically employed is cost-effectiveness. Internal efficiency addresses the question of how funds within the educational sector should be best allocated. Internal efficiency is also sometimes referred to as "allocative efficiency" or "price efficiency" (Lockheed and Hanushek, 1994).
2. External efficiency: it refers to what is often the topic of cost-benefit analysis: that is, the ratio of monetary outcomes to monetary inputs. Extensive consideration has been given to the issue of "external efficiency", or how the overall use of money for schooling compares to other potential public and private uses. The analysis of external efficiency provides information that is useful in deciding upon the right level of educational spending for a country, or in deciding upon the allocation of funds across different sub sectors such as primary education or vocational training. It does not, however, provide guidance about the specific policies that should be pursued within the educational sector. This guidance is provided through analysis of internal efficiency (Lockheed and Hanushek, 1994).

CONCLUSION

The paper shed lights on the roles of educational leaders in analyzing the cost-effectiveness, efficiency, and equity in the use of public funding for education. While cost-effectiveness seeks to find the best alternative activity, process, or intervention that minimizes resource use to achieve a desired result, educational efficiency seeks to the achievement of stated educational objectives at the lowest possible cost. This need to be done in which individuals can consider options and make choices throughout their lives based on their abilities and talents, not on the basis of stereotypes, biased expectations or discrimination.

The implications is that, educational leaders in order to use public funding for education, need to analyze cost-effectiveness by: know the overall policies of education or a specific program, identify the available resources for education, as well as true allocation of resources of education, guide the investing of education in the right track, looking for alternatives for funding education, and setting the priorities in achieving specific goals. Moreover, educational leaders for the sake of analyzing the equity, need to understand the diversity in students have

diverse needs, also how meeting these needs with the school budget, as well as how the resources are distributed to ensure equal opportunity across students. Besides, in analyzing the efficiency educational leaders need to: have information regarding to the objectives of education, as well as mobilizing financial resources for education, in addition to know the best way to allocate the scarce resources to meet the desired goals.

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