

productivity issue 2/89 gb/h-j

The Productivity issue in educational organisations:
some educational implications of efficiency campaigns

Geoffrey Burkhardt
University of Canberra
School of Education

(Paper prepared for the Economics of Education Symposium
Annual Conference of the Australian Association for Research in Education
Adelaide, November 1989.)

The Productivity Issue in Educational Organisations:
Some Educational Implications of Efficiency Campaigns

Geoffrey Burkhardt

In an economic climate which has emphasised the issues of educational output, school effectiveness and efficiency it is argued in this paper that there has been too little public consideration of the difficulties of applying input-output models to education organisations, in the manner of a business firm or a factory. The motivation for such "economic solutions" to making schools and universities "more efficient" has derived largely from purely short term economic considerations. In both USA and Australia attempts have been made to determine the "production functions" of education organisations. These efforts tend to ignore a number of important differences between education organisation and profit maximization enterprises in the business sector. The most important difference arises from the diverse nature of long term educational and social goals of schools and universities.

Evidence of this recent preoccupation of Australian governments and educational planners with short term "economic priorities" for education at the expense of longer term considerations can be seen in three recent important documents. In the National Interest - secondary education and youth policy in Australia highlights at the outset an economically dominant role for secondary schooling - designed to make schools more "productive". Beare has most aptly drawn attention to the application of the "Economic Paradigm" to education and the consequent dangers of an over-emphasis upon this perception of education.

In May 1988 the document Strengthening Australia's Schools states in its foreword the central role schools play (should play?) in the economy and emphasises that "we must concentrate on the most effective use of resources available to Schools" - further "we must continually look for ways to improve the quality, relevance and effectiveness of schools throughout Australia". It is not the intention in this paper to argue that schools and universities should not strive for quality and effectiveness, but rather that the pathways being followed currently by government and educational administrators towards the goals of quality and effectiveness appear to be those embracing mainly economic measures of efficiency, productivity and quality based upon input-output models more relevant to business organisations.

A third document which has had a profound impact upon the productivity/efficiency debate in Higher Education is Higher Education: a Policy Statement about which there has been extensive debate in the higher education sector. This debate has revealed the predominance of economic motives to justify moves to increase the efficiency and effectiveness of tertiary institutions. Again the input-output model has been applied to justify the economic desirability of mergers, increased graduate outputs, reduced costs per student place and the application of "performance indicators" to measure the productivity of educational organisations.

The Relevance of Input-Output Models

The application of Input-Output models to education organisations as a means towards creating greater efficiency and productivity in the organisation is not new in the literature of the economics of education. Glasman and Binianimov, Walberg and especially Hanushek during the last decade have been active in reviewing research on the production functions of educational organisations. The relevance of their comments and conclusions will be considered in more detail later in this paper where an attempt is made to differentiate the operation of educational organisations from business organisations in which definite production functions can be identified and measured and in which such analysis can be used as aids to policy making in those organisations.

Hickrod et al, building on the work of Hanushek, during the analysis of economic efficiency in Illinois schools claims it is important to differentiate between two types or concepts of efficiency - allocative efficiency and technical efficiency. He (and his co-authors) argue that the simple concept of efficiency as 'high ratio output to input' is not useful for the consideration of productivity in educational institutions partly because it reduces to an oversimplified set of measurements based on test scores as measures of output-and \$ costs as measures of inputs. Hickrod advances Hanushek's concepts of technical efficiency and allocative efficiency as a framework for clarifying approaches to the productivity and efficiency of educational institutions.

Allocative efficiency deals with the question of whether or not a sufficient quantity and quality of goods and services are being produced by the system to meet market demands.

Technical efficiency consists of maximising the inputs in such a fashion so that the greatest output is achieved relative to a given level of inputs. The Illinois study argues that considerable confusion arises in the educational profession because professional effectiveness has "somehow become confused with economic efficiency". The two goals are separate. I would argue that the same sort of confusion exists in Australia today. Recent efforts of Australian governments and planners in the domain of educational efficiency appear to have been concerned with the technical efficiency of the educational organisation (ie the simple input-output model - costs in relationship to output as measured by numbers of graduating students and/or their test scores). This is a short term consideration and implies that all inputs and outputs of a school or university can be measured (ie the production function can be quantified). While appropriate for a business organisation or a factory there are convincing reasons why the application of an input-output model for decision making in educational organisations is not at all appropriate. It is not appropriate because there exists basic fundamental differences between educational organisations and business organisations. These differences are enumerated and discussed as follows.

Differences between the productive processes in educational organisations and those in business organisations

It is argued that because of the following differences the concepts of effectiveness and efficiency usually applied within the context of an input-output analysis of organisations are less relevant to educational organisations.

The nature of the productive process

In the business/manufacturing sector the time taken for the productive process from input of raw materials to finished output is rarely more than 12 months, perhaps a little longer in the building and construction industry. In education organisations the process continues through 7 years of primary school, up to 6 of secondary school and in an increasing number of cases 3 or 4 years at tertiary level. In education it is difficult to measure when the process is complete, ie when a 'finished product' can be determined, as each stage of education is the basis for the next. At upper secondary and tertiary level students move in and out of education, as is the case with mature age returnees. They also change their status from part-time to full-time.

An input-output analysis of one sector of education, for example, secondary, does not provide sufficient time for the partly completed 'outputs' to demonstrate their potential qualities. Also, students in part-time employment quite often receive on-the-job training as an adjunct to their formal university or TAFE courses. This is often ignored in the input measurements of the education process. Thus it is difficult to apply an efficiency criteria to an education organisation in terms of input-output models because of the difficulty in deciding which sections of the output are finished products. A further complication to the application of the simple model occurs when partly 'processed' output units move from one productive unit in the industry to another (ie move from one school to another, one university to another).

In the production process education decision makers are apparently not guided by incentives to maximise profits or to conserve costs according to Hanushek. While the objectives and purposes of business organisations are clear and unequivocal and relate to short term combinations of inputs to maximised profits, the purposes of educational organisations are diverse, long term in respect of their impact on the quality of the output and very often in dispute among various sectors of the

community. In short, the education sector has a long gestation period for the generation of its output. The length of this period will differ from one unit of output to another. As Hanushek points out, the education process is cumulative, inputs applied sometime in the past affect students current level of achievement.

Measuring the Inputs

In education there is great difficulty in measuring and identifying and costing all of the inputs eg individual student backgrounds, concepts and skill differences among a student intake, differences in family socio-economic backgrounds, status and the quality of the home learning environment. As Hanushek comments, "how much arises from factors malleable in the short run (current income and consumption, physical surroundings, current attitudes etc) and how much arises in the longer run, less malleable attributes (such as parental education) is unknown although longer run attributes are probably more important".

He claims that there is conclusive evidence that differences among schools and teachers are important in achievement. Schools, he claims "simply do not have homogeneous impacts on students". However, in business enterprises the impact of the production process upon the inputs is regarded as homogeneous.

Glasman and Beniaminov in their study of input-output analysis of schools support this view acknowledging that student characteristics of family size, father's education and student gender affect verbal achievement. The majority of these input variables cannot be costed and important though they are in the production process are not taken into consideration when attempting to measure the efficiency and productivity of an educational organisation.

Another basic difference between the education industry and other productive enterprises is that in education organisations some of the most important inputs cannot be changed by organisation decision makers. In other productive organisations, the production mix (ie combination of inputs) can be varied to maximise the quality/size/rate of output.

Measuring the Outputs

It is in this area that some of the greatest difficulties accrue for the input-output model in determining the productivity and efficiency of educational organisation in terms of short term production function models.

A set of inputs in a business organisation or manufacturing firm (given a standardised production process for all inputs), always produces exactly the same amount of output - and to a large extent the same quality of output. In educational organisations the output is not homogeneous. Much emphasis has been placed on the simplistic and easily recognisable measures of education output such as test scores and grades and numbers of graduates from each stage of the education process. Hanushek explains that education is a service which transforms fixed quantities of inputs (ie individuals) into individuals with different qualities. Beyond simple output measures the important outcomes of the education process cannot be quantified. The problem of measurement is complicated by the application of different criteria used for the measurement of the quality of the output of schools and universities; eg in some cases the percentage of a final year of graduates in a university course that finds employment in their first few months after graduating is often used as a yardstick for measurement. In other cases it is the average starting salary of graduates from a particular school/faculty that is used as a measure of quality.

HSC secondary school student test results have been shown not to be a particularly good predictor of success in higher education thus it is inappropriate to measure a school's productivity in terms of the percentage of its students it sends to tertiary institutions.

Markets

Business organisations mould and target their outputs for specific markets or market sectors. Their production strategy is most often directed towards meeting demand for their output in the short term and building consumer confidence to establish a continuing share of the market. Educational organisations do not attempt to manipulate the market and rarely tailor their output for specific market sectors; eg an engineer graduate from an engineering faculty is free to compete for jobs in the public or private sector, locally or in foreign markets. In business organisations "product loyalty" is bought with expensive promotion campaigns. In educational organisations advertising is not so much directed towards championing the quality of the output, but attracting a higher quality of input (ie beginning students). Education institutions are more likely to be encouraged to conform to a government sponsored 'manpower plan' for the supply of specific categories of labour that is not adequately supplied through the operation of market forces in a competitive market system. When such 'manpower planning' initiatives are pursued by governments, issues of technical efficiency are not normally of prime consideration.

Implications

The utility of the technical efficiency model for the measurement of an educational institution's performance is considered inappropriate in the light of the varieties of difference between business organisations and education organisations. Because the production functions of educational institutions differ so markedly in terms of family backgrounds of students, race, attitudes, gender, and school environment efforts to address the productivity and efficiency issues of schools and universities through the traditional input-output model will lead to oversimplifications and quite often become very misleading in terms of consequent policy decisions.

There are dangers for the long term future of schools and tertiary education from attempts to distort the allocation of resources to education sectors on the basis their current short term 'efficiency' and productivity. To close or merge education organisations simply on the basis of their technical economic 'efficiency' in the short term is to ignore the considerable differences between the nature of the production functions of education organisations and those of business and manufacturing organisations.

Education organisations should be assessed in terms of their achievements and outputs in the long term on criteria which reflect their social and cultural goals in addition to short term economic criteria.

Reference and Notes

- Commonwealth Schools Commission, In the National Interest: Secondary Education and Youth Policy in Australia. Canberra 1987, pp3-14.
Beare, H, Shared Meanings about Education: The Economic Paradigm Considered. Australian College of Education, Melbourne, 1986.
Minister for Employment, Education and Training, Strengthening Australia's Schools:

- A Consideration of the Focus and Content of Schooling, AGPS Canberra, 1988.
- Higher Education: a Policy Statement, Commonwealth of Australia, AGPS, Canberra, 1988.
- Glasman, N S and I Binianimov, 'Input-Output Analysis of Schools' Review of Educational Research, Winter 1987, Vol 51, No 4.
- Walberg, Herbert J, 'Improving the Productivity of America's Schools', Educational Leadership, May 1984.
- Hanushek, Eric A, 'The Economics of Schooling: Production and Efficiency in Public Schools', Journal of Economic Literature, September 1986, Vol 24.
- Hickrod, G Alan, et al, The Biggest Bang for the Buck: an Initial Report on Technical Economic Efficiency in Illinois K-12 Schools, Centre for the Study of Educational Finance, Illinois State University, Illinois 1989.
- Hanushek first raises this distinction in an earlier paper, 'Conceptual and Empirical Issues in the Estimation of Educational Production Functions', The Journal of Human Resources, Vol 14, No 3, 1979..
- Hanushek, E A op cit p370.
- Hanushek, E A op cit p377.
- Hanushek, E A "The Economics of Schooling" op cit p1151.