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ECONOMICS OF EDUCATION:

DISAPPOINTMENTS AND POTENTIAL¹

Stephen P. Heyneman

Introduction

Research on the economics of education has developed along two broad lines. The first draws upon the theory of economic growth to assess the contribution that education has made to output in modern economies. The second has employed analytic methods based on micro-economic theory to examine the effects of investments in education and training on the size and distribution of individual incomes and to suggest ways in which the efficiency of the education process might be improved. This paper is concerned only with the second of these two research traditions.

The second line of research has been directed at teachers, school officials and education ministers on the grounds that it would help them formulate policy and make investment decisions. But the bulk of the economics research has been superfluous to making educational decisions. It has over-emphasized rates of return to

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expansion by level, and under-emphasized the economics of educational quality, new subjects, target groups, teaching methods, and system reforms. It has virtually ignored the dependency of one part of the education system on other parts, for instance the essential contribution made by secondary and higher education to the quality of basic education. When dealing with vocational education the economics literature has followed a traditional misspecification now three decades old. When discussing the equity of participation in higher education, the research has appeared gratuitous in nature, for it has continued to offer recommendations on a problem which has been solved by no nation, rich or poor, capitalist or socialist. To complicate matters further, it is common to find disparaging references in the economics literature to the education community and to educators, as if reluctance to embrace the economic evidence being presented was a sign of irrational conservative behaviour. These remarks persist in spite of the fact that the evidence itself derives from supply-driven questions originating within academic economic traditions.

However, the demand for sound economic decisions in education is on the increase. School systems confront similar challenges, and will therefore require similar types of new analyses. These include: economic benefits of new curricular programmes, managerial innovation, and policy shifts. New analyses should entail a quantum jump in case studies and small samples of economic performance based on questions in demand from the education community itself. The future health of both communities will depend upon an improving relationship between them. To that end, this article proposes a 'code of conduct' for education economists and for educators to follow. The result could be an era of new innovation in educational economics involving new techniques to respond to new questions, relevant to new theories and new practice.

Background

In July a member of the Allegheny, Pennsylvania, school board told the National Education Association that 'there are two words which are electrifying the industrial world. Those words were "scientific management", and they contained a "message for every teacher".' If 'teachers did not voluntarily take steps to increase their efficiency, the business world would force them to do so.' The year of that statement was 1911 (Callahan, 1962, p. 100).

A half century later, large-scale survey techniques provided James Coleman et al. (1966) and Christopher Jencks et al. (1972) with the means to make similar arguments, only on more scientific grounds. Schools were characterized as inefficient and ineffective, and therefore required radical restructuring. Then it was argued that these findings from the United States of America were typical of the rest of the world, including those from developing countries (Simmons & Alexander, 1978). Fifteen years later, despite mounting evidence to the contrary (Heyneman, 1975; 1980a; Heyneman & Loxley, 1983), the terms of debate

remain unchanged. According to Hanushek: 'There is no systematic relationship between school expenditures and student performance,' and 'these findings are not being greeted with enthusiasm by educators because it has clearly indicated that their current operations are inefficient and broadly ineffective' (Hanushek, 1994, p. 5). And again, as before, there are rebuttals (Hedges, Laine & Greenwald, 1994a; 1994b; Kremer, 1995).

That the debates in the economics of education appear both repetitive and full of confrontation once caused Russell Davis to remark that he felt:

like Rip Van Winkle, who woke up after a forty-year sleep and found everyone else still sleeping. Though most papers have a section which looks to the future and volumes end with an 'agenda for the future', most events are out of date; theoretical material is vintage; and the topics and models and methods are not what administrators or managers talk about, or talk about doing (Davis, 1985).

Davis' criticisms apply particularly to the economics of education in 'developing' countries. But the field in general has been slow to ask the questions whose answers are necessary for educators to run education systems better, and has been quicker to ask questions generated by concerns within the academic economics community. Questions coming from the education community tend to be driven by the increase in expectations for educational excellence across many new and competing dimensions in an environment of stagnant or declining resources. Questions in the latter category tend to emerge from the abundant supply of economists employed in university and development agency settings. The mismatch between supply-driven and demand-driven questions continues to be a source of tension. Economists sometimes assert that educators ignore 'the evidence'. Educators assert that agency and university-based economists have evidence but on the wrong questions.² It is hoped that this paper may begin to clarify these differences and help ameliorate them.

If one excludes the macro-lines of inquiry into human capital—the contribution of education investments to general economic growth and to the alleviation of poverty—then the evidence commonly used for guiding educational strategies generally falls into three categories: (i) returns accruing from additional years of 'exposure' to schooling broken down by 'horizontal' levels; (ii) the internal efficiency in the use of educational resources; and (iii) comparisons of ratios of students at elite levels with their representation in the wider population. In terms of policy advice, the results from these types of inquiry over the last twenty-five years have basically elicited the following generalization:

Primary education is a better investment than secondary or higher education. 'Academic' generalizable skills are better investments than 'vocational' skills. School systems are not effective in allocating and using resources. And as a result of biases in who attends, higher education should be priced more highly and students from impoverished backgrounds should be protected, through loans with subsidized rates of interest (Psacharopoulos, 1973, 1981, 1985, 1987a, 1987b, 1995 forthcoming).

For instance, when technical education is used as a means to ration higher education, it results in a distortion of internal resources, so serious that it affects the ability to finance basic education adequately. Each of these implies that investment decisions concerning one level cannot easily be isolated from investment in other levels. For this reason many educators regard the evidence on rate of return by level as interesting but superfluous to making sound managerial decisions.

The non-monetary-in-kind benefits from basic education are considerable—better health practices, reduced family size, improved household management, etc. But are the non-monetary benefits from basic education higher than those from other levels of education? There are public good benefits as well—a more literate and aware citizenry, for instance. Though there have been attempts to assess the strengths of the non-monetary benefits, as yet, there is no acceptable means of comparing those which result from different levels of education. Nor is there an acceptable means to quantify relative strengths of public goods by educational level. As Rivlin pointed out thirty-five years ago, higher education is, in part, a public good which provides new research, new products and the preservation of culture. The benefits may very well be higher for the society than for the individual, and the benefits are not amenable to a common currency. 'No one has yet developed a method for estimating the total return that society is getting or might get on its investments in higher education' (Rivlin, 1961, p. 137).

Participation in higher education

But what about the equity argument? Is it not true that places in higher education are inequitably distributed? Do not children of the wealthy attend in higher proportions, and should not that help determine higher education investment strategies?

The answer comes in two parts. The first has to do with providing equality of educational opportunity in pre-university education. The definition of equality of opportunity has been the subject of wide debate, but the essence can be reduced to having the opportunity to utilize equal educational resources (Heyneman, 1980*b*). If such equality is provided, then the second part of the answer becomes pertinent,⁸ suggesting that it is not necessarily true that public investment in higher education should be lowered because there is an inequality of participation.

By tradition, the question of over- or under-representation in higher education is first approached by making inquiries as to the social origins of the student population. Anderson was among the first to calibrate this by asking a random sample of Oxford and Cambridge university students about the educational attainment of their parents and the occupations of their fathers. He then compared the results to the estimated percentages in the population at large of the generation with university-age offspring (Anderson, 1952; 1956). Over the last forty years there has been a wealth of new material gathered on the question of representation. Studies have included the United Kingdom (Halsey, Heath & Ridge, 1980), France (Millot, 1981), Germany (Craig, 1983; Williamson, 1977), and many other

countries of the Organisation of Economic Co-operation and Development (OECD) (Passeron, 1979; Busch, 1975). Surprisingly, there has been a long research tradition on social representation in higher education in the USSR (Dobson, 1977, 1980; Anderson, 1977; Jones, 1978). And there is a long line of inquiry on the same question in lower-income countries beginning with Ceylon (Strauss, 1951), Ghana (Foster, 1965; Peil, 1965; Weiss, 1979); Kenya (Prewitt, 1974); the Republic of Korea (Snodgrass, 1977); China (White, 1981); Colombia (Selowsky, 1979); Malaysia (Merrman, 1979); and many others. Early surveys focused on students' social origins; later surveys gathered information from household populations about educational attainment, thus permitting generalizations about social representation *ex post facto*.

Findings have been used to justify the policy changes in educational finance, the targeting of public assistance (often through loans) to those with lower socio-economic backgrounds, and a shifting of public investments away from higher education toward lower levels of education. This re-allocation has traditionally been justified on the grounds that higher education participation is imbalanced toward those of higher social origins and therefore that the benefits of higher education constituted a perverse cross-subsidy from those who are poor to those who are rich (Hansen & Weisbrod, 1969; Moor, 1982).

Disagreements over whether disproportional representation in higher education in fact 'hurts' the poor have been present from the outset (Pechman, 1970, 1972), but equivocal results in the eyes of the education community are not the main problem. The main problem is the absence of any study concluding that participation was sufficiently equitable. Since imbalance is universal, the question which arises in the minds of educators is what constitutes a 'normal' or 'acceptable' degree of imbalance?

An answer to this question does not seem to emerge even when one looks at trends over time, and even in countries known for having strong admission policies favouring those of lower socio-economic status. The student population attending universities in the USSR, for instance, has not changed significantly since the 1930s. In 1939, university students from professional backgrounds were 2.4 times over-represented in Soviet higher education; in 1970 they were 2.1 times over-represented. University students with professional backgrounds were over-represented in France by a factor of 2.8 in 1950, and by a factor of 2.4 in 1965. In the United Kingdom, students with professional backgrounds were over-represented by 2.6 in 1961 and by 2.4 in 1979; in Japan by 2.4 in 1953, and by 1.8 in 1968; in Hungary by 3.1 in 1931 and by 3.2 in 1963. Even in the United States, with higher rates of post compulsory educational participation than for those other countries on which there are data, students with professional backgrounds were over-represented by a factor of 2.4 in 1920 and by a factor of 1.5 in 1954 (Anderson, 1983, Table 8).⁹

From the point of view of the education community, and most particularly, a minister of education, the economic research on equity in higher education may have reached a point of diminishing returns. No one would argue against the

proposition of encouraging and subsidizing low-income students. One finds that such programmes are common around the world. But equity policies in higher education are not free of cost. And since there is no precedent for obtaining equity of participation, there is no economic guidance on how much a society should invest in it. Is over-representation of students with professional backgrounds by 100% acceptable? Higher education in France, the United Kingdom and Japan demonstrates such levels, even after considerable efforts towards amelioration. Such high levels of inequity did not seem to prevent the economic development of these countries. What about low-income countries? What would be the economic benefits if a country achieved an improvement in the social representativity of higher education? Or, more realistically, what might be the economic benefits for improving one category of an under-represented social group—say lower socio-economic status groups—as opposed to females, rural residents or indigenous peoples? The economics of education literature is comparatively silent on the issue of off-setting target groups though it has long been known that an increase in the proportional representation of one group may diminish the representation of another (Galanter, 1984; Heyneman, 1980*b*; Klitgaard, 1986; Tzannatos, 1991).

The point is not whether countries should cease from trying to insure an equality of opportunity. Social justice is sufficient rationale (Rawls, 1971). Rather, the point is that recommendations concerning the distribution of higher education places are based on values. There is little economic evidence to suggest what returns might be expected from a shift in the proportion of under-represented students in higher education from *X* to *Y*. This may help explain why ministers of higher education and university presidents appear impatient with the traditional argument for lower public investment in higher education on the grounds that there is inequitable participation. Lower public investment in higher education may be justified on grounds other than equity. But since administrative mechanisms for instituting loan schemes are non-trivial, and because there are many ways to raise the private costs for obtaining higher education (Colclough, 1990), university managers are justified in questioning the logic of the equity argument for lowering public higher education investments. 'Whatever might be the merits of introducing a loan scheme to encourage more students from needy families,' Eisemon and Salmi point out, 'under circumstances of more cost-recovery, student loans cannot be regarded as a policy instrument that is likely to increase equity in participation in higher education' (Eisemon & Salmi, 1995, p. 3).

Given these problems with the traditional economic evidence on the expansion of education by level, how is a society to decide on what to invest—whether to invest more in one level or another? There are extreme cases, of course, where the numbers attending basic education are minuscule, and its priority is obvious. But these instances are increasingly rare in the world, mostly limited to sub-Saharan Africa and some parts of South Asia. In general, the decisions are more complex because the institutional requirements overlap. More textbooks are needed for elementary education; more opportunity for higher education is needed simultane-

ously. Since economic science is too weak to support an unequivocal position, other mechanisms must be used.¹⁰ What are they?

In Gutman's view, the economic case for subsidizing higher education does not depend on establishing its greater empirical urgency over other public or mixed (public and private) goods. It is justifiable for governments to subsidize any good which is at least partly public. Since there is no acceptable economic evidence which can determine the investment choice between educational levels, governments should subsidize higher education in the same legitimate manner in which all difficult choices have to be made—investments in police protection, public health, defence. Beyond what social justice would require for compulsory education, the decision on higher education should be made on the basis of democratic deliberation and decision-making at the appropriate levels of government (Gutman, 1987, p. 230).¹¹ Gutman reminds us that, in a democracy, whenever there is insufficient empirical evidence to answer a question conclusively, the highest authorities in determining public policy are representatives elected by the voters. And if they choose to subsidize higher education, there is no evidence strong enough to suggest that this is a mistake.

Investments in education quality

The second category of educational question has to do with the economics of educational quality. Quality issues are commanding increasing interest (Behrman & Birdsall, 1987; Card & Kruger, 1992; Harbison & Hanushek, 1992; Heyneman & Loxley, 1983; Kemmerer & Wagner, 1985; Moll, 1991, 1992; Solmon, 1985, 1987). However, with the exception of Behrman and Birdsall and Harbison and Hanushek, few have tried to compare the returns to an improvement in educational 'quality' to an improvement in educational 'quantity', though that question is a natural one to ask. Nor is an aggregate figure on the returns to 'quality' of much interest on its own, when the real issue is what kind of quality, in what amount, and with what corollary investments and institutional requirements?

School administrators are faced with decisions on specific cost/effectiveness quality-improving investments and various trade-offs. What they want are guides to specific investment choices. It is true that the economics literature is making advances. For instance, it appears that attending an 'elite liberal arts college' is a good investment (Fox, 1993). So is a foreign (as opposed to a domestic) degree in low income countries (Lee, 1982). Economists have attempted to calculate the returns on computer-assisted instruction (Levin, 1986); magnet schools (Chabotar, 1989); various science degrees and the level of qualification (Lakshmanasamay & Madheswaran, 1983); smaller learning-group sizes (Bacdayan, 1994; Kemmerer & Wagner, 1985); 'active' learning and other pedagogical characteristics of specific schools (Glewwe et al., 1995; Landgren, 1993); textbooks and radio-assisted instruction (Jamison et al., 1981).

What can we learn from the literature on how important an investment quality compared to an investment in something else is? What are the complements

tarities and interdependencies across various quality-improving investments? To whom should quality-improving investments be targeted? To the gifted? To the handicapped? The same for every subject and every grade level? Differently in different grade levels or in different subjects? Simply knowing that better books are a cost-efficient means of raising average science achievement is insufficiently interesting if educational managers are being held responsible for achievement across a wide variety of interdependent inputs, and for products which reach well beyond academic achievement in science—moral values, moral behaviour, and a common sense of citizenship (Young, 1983; Dewey, 1956, p. 18).

Two generalizations might be made about the status of the literature on the economics of educational quality. First is that the literature is more abundant in OECD countries, hence more useful to educators in OECD countries. By 1991, there were about 100 quantitative studies on the economics of school resources in developing countries, but there were four times that level available in the United States alone (Hanushek, 1995, p. 229). There is a gap in sophistication as well. The economics literature still has a long way to go before it is adequately able to specify the complexity of the teaching and learning circumstance. There is nothing unusual or wrong in this inadequacy. Economics is more successful in estimating production functions when there is a single product (e.g. rice), and when the influences on productivity are physical. The difference between a classroom and a farm is that soils do not depend upon motivation. What this implies is that a tone of humility would be in order when discussing results.

Vertical investments in specific curricula and specific abilities

Facing most educators are three kinds of variables which must be factored into the 'vertical investment decision': the first is the interest of the learner; the second is the learner's ability; the third is the institutional and managerial prerequisites for success. Here one might draw on work on the economics of high and low achievers in Norway (Bonesronning & Rattso, 1994); on the returns to those with disabilities who invest in college (Dean & Dolan, 1992), or the effect of having a 'co-operative work environment' (Min & Tsang, 1990). But, in general, the interest in this category of investment decision has been sparse. What is the economic evidence on the proper 'vertical track' for those with attention deficit disorder? For those with more advanced spatial ability? For those preparing for new specializations in medical technology?

Scarcity of economic evidence is not the only problem though. Equally serious are economic arguments with insufficient understanding of curricular principles. One example is the common method of casting the question of vocational versus academic education as if it were a binary trade-off. Foster (1968) intentionally framed the first discussion in this manner almost thirty years ago in order to provoke a debate in the United Republic of Tanzania. The purpose was to 'shock' the audience out of a long-held misconception that vocational education was more

'practical'. To be sure, challenging the assumption that manual experience was therefore 'more practical' has been an arduous process (Heyneman, 1972*b*, 1979, 1985, 1986, 1987), but one which is now concluded. Three decades later, on the other hand, the issue of 'vocational education' continues to be cast by some as though it were a binary choice (Psacharopoulos, 1987*b*).

Of course, many noteworthy economists have given fair warning. Blaug (1985) points out the 'blurred' differences between vocational and non-vocational skills, as does Schultz (1975), and Hanushek (1981). Kang & Bishop (1989) ask whether vocational education is not complementary to academic education. Freeman argues that 'there is a substantial and growing body of evidence that, contrary to traditional views of student decision-making, young persons are highly sensitive [. . .] to the state of the labor market. For a wide variety of fields ranging from law to physics to psychology to accounting' (Freeman, 1989, p. 21). Bowman points out that literacy was once classified as a vocational skill (Bowman, 1990). Dougherty (1989) argues that vocational preparation includes the teaching of applied sciences in electronics. Kostakis argues that preparing for the university entrance examination in Greece constitutes vocational education, but that which is labelled vocational education in Greece has a 'large generalized component' (1990, p. 399). Lewis, Hearn and Zilbert argue that office keyboarding is a generalizable skill (1991, p. 333). After reviewing thirty different British studies, Drake (1982) argues that vocational training 'has so many different independent categories of result, that the only proper use of them is as "conditional information", not a categorical guide to investment.' Bowman (1990) refers to this tendency to misspecify vocational education as a 'wide-spread failure of communication [. . .] in which those most deeply involved in assessment of "diversified education" are least enthusiastic about such policies.' Dougherty (1989) says that the debates over vocational education are 'bedevilled by the failure on the part of both advocates and critics to clarify what is meant by "it".'

The problem of generalizing about vocational education has been highlighted by the recent report of the United States National Academy of Sciences, which points out that the international classifications about what vocational education means, now many decades old, are seen as 'outdated and culture bound' (National Academy of Sciences, 1995, p. 27). If this is correct, then much of the literature which attempts to judge the economic returns to binary concepts of vocational education is simply null and void. It is the misspecification in the economics literature about vocational education which appears to have caused Fay Chung, then the Minister of Education of Zimbabwe, to declare that the research work economists have done on vocational education as being 'very narrow' (Chung, 1989). Chung labels this work as 'narrow', correctly in my view, because it illustrates a surprising absence of understanding of the principles on which students choose and educators design educational programmes and invest in them.

Educational programmes are designed according to curricular principles established in the field of human psychology. Among them are the defining and sequencing of skills and principles, the interaction between theoretical practice and

practice through manual or observational means, and the targeting of educational experience differently in different age, ability and interest groups. In terms of specific curricula, plumbing is not the same as carpentry, and fish culture differs from agriculture. Investments are made in curricula differently and, if aggregated across these differences, results are not helpful either to those faced with making investment decisions, or to those faced with making managerial decisions. It is not helpful to know that the economics literature reports that the returns to 'vocational education are low' when what a student living in a suburb of, say Cairo, wants to know is whether or not to study horticulture.

Investments in policy change

The fourth category where an educational investment may elicit an attractive benefit is in the field of policy change. In the education profession, policy change is the equivalent of a 'bull market'. The interest expressed in educational policy knows few international boundaries and is in demand virtually everywhere: merit pay, examination policy changes, vouchers, time on task, performance standards (Heyneman, 1993a; 1993b). In each instance, the question being asked is the degree to which one can anticipate economic benefits—greater internal efficiency, more effective distribution of resources—attributable to a change in policy.

Some pioneering attempts have appeared in response to this demand. This seems particularly true on questions having to do with the allocation of teacher and teaching time (Bacdayan, 1994; Brown & Saks, 1987; Fisher, Marliave & Filby, 1979); student time (Levin & Tsang, 1987); cost-recovery strategies (Tilak, 1995); strategies for teacher selection (Levin, 1970); magnet and other school configurations (Chabotar, 1989); payment-by-results and other teacher salary issues (Cox-Edwards, 1989; Kemmerer, 1990; Rapple, 1992); on-the-job pedagogy (Landgren, 1993); and over-concentration in educational markets (Borland & Howsen, 1992). But in general, the economics of policy change is in an infant stage of empirical development.

New responsibilities, new questions

That economic analysis has failed to answer many of the professional's questions has not gone unnoticed (Burkhead, 1973). One report in *The Economist* pointed out how inaccurate human capital predictions have been when the definition of 'literacy' remains so subjective, and the meaning of 'school attainment' so variable (*The Economist*, 1995). Killingworth (1993) raises similar concerns when he questions the degree to which earnings adequately capture differences in skill, effort, responsibility and working conditions. But misspecification may be attributable to many sources. One of them is the impoverished state of statistics necessary to make even modest educational generalizations (Heyneman, 1993a; Puryear, 1995; National Academy of Sciences, 1995; *The Economist*, 1995). Yet, regardless of the source, Samuelson (1995, p. 44) concludes that 'economic wisdom has not yet pro-

gressed to the point where desirable changes can be ordered *à la carte* [...] it can detect general tendencies and illuminate broad choices, but that's about it. In the end, the public is not fooled, only disillusioned.'

How then are educators to go about asking questions of the economics profession? And how is the demand for economic analysis to be measured?¹² As the health economist is required to appreciate that there are differences in the consequences and treatments between influenza and pneumonia, so too must the education economist be sensitive to the requirements of teaching and learning.

The education economist must appreciate the nature of teaching and the teaching profession (Dreeben, 1970; Cuban, 1980). The education economist must also appreciate that these are differences in age and styles of individual learning, and that there are different resource implications for different pedagogical objectives. The education economist must be able to distinguish class size from pupil/teacher ratio;¹³ between knowledge and the application of knowledge; between cognitive and affective performance; and between (Western expectations for) individual performance and (Asian expectations for) group performance.

The education economist must be prepared to consider divergent educational products and divergent educational consequences. The economist must always keep in mind that there is a danger of not fulfilling an expected educational function—in spite of the fact that such functions cannot be subjected to economic criteria. As Burkhead et al. point out, 'there is no reasonable educational equivalent to the maximization of profits' (Burkhead, Fox & Holland, 1967).

Children are not free market goods on which to experiment. In the eyes of a parent—especially a parent in a democracy—there is 'zero tolerance' for error. Educational officials are held publicly accountable for error. In general, economists are not. To be credible to the education profession, the economist must demonstrate an appreciation of the education endeavour, and a respect for the burden of public responsibility which rests on classroom teachers, school directors and ministers of education.

That many economists are not as knowledgeable or as understanding as they should be is an understatement. But it is also true that many are, and that some lines of inquiry hold out the possibility for making significant educational progress. First there are those within the economics profession calling upon their colleagues to 'get creative' about what it is they are measuring and the processes by which they value benefits. Bowman and Anderson, for instance, conceive of five separate sources of human capital development which economists should consider: (i) attachment to people or institutions through apprenticeships; (ii) families (the primary influence on moral behaviour); (iii) educational institutions; (iv) employment; and (v) oneself (Bowman & Anderson, 1976). Freeman calls upon his colleagues to become 'detectives' in the field of education (Freeman, 1989), and hence to provide a 'mixture of thoughtful data analysis and economic common sense'. Akin and Stewart (1982) remind their colleagues that education is a cumulative process and that learning achievements are a function of time allocation, ability and external resources.

True breakthroughs in the economics of education are likely to occur when economists ask the questions in demand from educators. Michael (1982) points to the work which needs to be done on motivation, psychological and physical health. Hoenack (1994) points out the need to emphasize organizational determinants of economic behaviour. Schultz has called for emphasis on different intellectual skills, perception, problem-solving, ability to translate personal challenges into the firm's goals, and the like (Schultz, 1975). Brookins (1995) has called for an emphasis on 'behavioural economics'. Eisemon may have begun to operationalize these questions in his pioneering estimate of the behaviour shift in adults stemming from a change in performance objectives on a health section of a secondary school entrance examination in Kenya (Eisemon, Patel & Abagi, 1988).

True breakthroughs, however, are unlikely if the economics community repeats past errors. One such error was to over-emphasize results which might be obtained from large-scale programme evaluations. They elicited little insight compared to the cost of their complex designs (Raizen & Rossi, 1981). Another was to rely on production function methodologies to distinguish among individual inputs to the teaching and learning process or upon new methodologies to separate out the influence of the class, as opposed to the school, the district or the region (Heyneman, 1989).¹⁴

Education economists can be more methodologically creative by placing new emphasis on case studies and small sample analyses of economic performance. In this they may take a lesson from the quite heroic efforts at gauging effects over time (Rutter, 1979; Schiefelbein & Farrell, 1982; Peaker, 1971; Hyman, Wright & Reed, 1975); in specifying cultural values which govern economic effects (Fuller & Clarke, 1994); or in producing genuinely innovative indicators which combine economic success across different categories of investments, such as quality and quantity (Caillods & Postlethwaite, 1989; Lewin, 1995).

Conclusion

As Windham and Chapman (1990) illustrate, in the end we all face the reality that we know very little about the economic effects of educational decisions and, as a result, the sector remains vulnerable. Education economics has made deeply significant contributions to our understanding of the macro-decision to invest in human capital. But the field has yet to make a significant dent in the questions educational managers raise in their day-to-day work. It must be remembered that the 'black box' of the educational enterprise is dark in the mind of the economist, but not in the mind of the educator.

As countries are asked to adhere to a 'code of conduct' when making international agreements, and doctors and lawyers are asked to adhere to similar professional standards in their relationships with clients, so too has the educator a right to expect a measure of professionalism from economists who work in the field; and economists have the same right with respect to educators. This standard might begin with three elements:

- the absence of *ad hominem* arguments about motives. For a century, remarks about the conservative or self-interested nature of the teaching profession have characterized some economic discussions. Whether or not this is an accurate reflection is not the point; the point is that it is not likely to lead to a constructive conclusion.
- the specification of assumptions behind data and conclusions. ‘Class size makes no difference’; ‘money makes no difference’; ‘educational investments are ineffective’—these are all examples of conclusions which require specification.¹⁵
- the generalization about what constitutes the field. More studies have been conducted on the first category of question—returns to quantitative expansion—, but this represents only one of the four major categories of educational investment questions. Rates of return say little about the nature of economics of education in the other three. Decisions on priorities for educational investments should not be made without a review of all four categories.

On the other hand, there are principles governing the attitude of educators to the field of economics which are of equal importance. Because education is a public good and therefore a public investment, it is natural to expect that the education profession will welcome economic questions and be among the greatest consumers of sound economic advice. It is not fair to ignore the essence of that advice on grounds that the evidence is imprecise. It is unwise to not be interested in the economic questions whose answers hold out the promise for improving education. However, the education community has a responsibility to demand better economic evidence on a wider variety of educational questions. Past questions in the economics of education were driven less by a search for insight and more by an adherence to disciplinary tradition. Both economics and education would benefit if the past questions were jettisoned in favour of the questions in demand from the education profession itself.

Notes

1. This article was originally developed with the encouragement of Dr. Lakshmanasamay at the University of Madras for a series of essays in tribute to Nalla Gounden, and it appears in *Prospects* with his permission. The author gratefully acknowledges the advice and encouragement received from economist friends teaching at the Universities of Chicago, Vanderbilt, Sussex and George Washington, and the State University of New York at Albany; from many colleagues in UNESCO and the World Bank; and especially colleagues in his own division. All gave their time most generously. However, the views are those of the author alone and, in particular, do not necessarily represent those of the World Bank or any of its affiliated institutions.
2. In the United States of America, this ‘tension’ over the lack of utility in the kinds of economic questions asked by the academic community led to the establishment of an economic society focused exclusively on the problems of education management: the American Education Finance Association.

3. 'Horizontal' investments are those undifferentiated by specialization and generally fall into the categories of primary, secondary and higher. 'Vertical' investments are those which cross horizontal lines and lead to a curriculum experience different from others. These may include: a new professional specialization or a new educational objective such as environmental awareness, physical fitness, etc.; as well as the special needs of the gifted, the handicapped and the like at primary, secondary or higher education levels.
4. By tradition, economics has been less interested in questions of technical alternatives, which have been the main lines of inquiry in operations or engineering research.
5. The term 'exposure' is employed here in order to illustrate the crudeness of economic measures on quantity. Typical units are marginal differences in years (nothing less). Little distinction is made between intended, delivered and received curriculum; and few (accurate) controls are placed on differences in the quality of educational materials, subject matter or alternative product. Hanusheck (1994; 1995) has been particularly eloquent on this point of the inadequacy of rate-of-return evidence by educational levels to guide investments without simultaneous attention to investments in the quality of education.
6. The term 'opportunity to teach' differs from ability to teach in the same way that the term 'opportunity to learn' differs from ability to learn. 'Opportunity to teach' refers to the classroom environment required before good teaching can be effective.
7. The literature on the economics of vocational education has been particularly negligent on this point. Vocational education was commonly used as a tracking mechanism to delay labour market entry, to ration higher education, or both. This is lamentable because these functions are both expensive and ineffective. Students in terminal vocational education tracks tend to be more discouraged and angry than the typical general age cohort, because their opportunities for occupational advancement have been foreclosed. The lower the percentage of the age cohort in terminal vocational attendance, the higher the returns to vocational education are likely to be. This implies that the returns to vocational education are determined less by the nature of the curriculum and more by whether it serves other intervening social functions. However obvious and important these functions may be to the local political leadership, the economics literature generally ignores them.
8. On the question of equity of the distribution of educational resources in pre-university education, the economics literature has served as an enormous resource and has provided a genuinely creative series of arguments, empirical techniques and policy recommendations.
9. The lack of corresponding dates in different countries is attributable to the difficulty of aligning shifting definitions of socio-economic status, shifting definitions of higher education in different studies, and different means of estimating the representation of socio-economic strata in the general population (Anderson, 1975).
10. Historically, we have come to refer to elementary schooling as 'primary' and to post-primary schooling as 'secondary'. Gutman argues that this distinction made sense in a society where the demands of literacy and citizenship were low. Today, high school is a necessity for adequate preparation for democratic citizenship. Since the complexities of a democracy do not differ among rich and poor countries, in reality all countries require high school education as a part of basic education (Gutman, 1987, p. 49). Only three levels are now meaningful in schooling: pre-compulsory, compulsory and post-compulsory. Though not all societies will be able to afford the same level of

- access, all societies will try to have the same access objectives, regardless of the rates of return to different levels.
11. To be fair, decisions over public goods are not impervious to empirical scrutiny. Some roads are more 'public' than others. The poor tend to benefit more from roads leading to markets than from roads leading to airports. In education too there are ways to distinguish relative public weights. For example, in OECD countries public expenditures for each student in higher education are typically double what they are for each student in compulsory education. In non-OECD countries the difference is even greater. Per student higher education expenditures are three times more in Singapore, Hong Kong, Taiwan and the Republic of Korea; four times more in the Gulf States; eight times more in Latin America and the Caribbean, as well as in Tunisia; fourteen or fifteen times more in Jordan and Morocco; and as much as 100 times more in parts of sub-Saharan Africa. In cases where the quality of compulsory education has been neglected, the social justice of having lower unit expenditures would be questionable.
 12. One can distinguish the degree of relevance among education economists by their demand in serving as paid consultants to those who manage education systems.
 13. The economist who does not distinguish between these two concepts comes close to 'professional malpractice'. When it is argued that 'class size makes no difference', what is really meant is that the size of the pupil/teacher ratio makes no difference. The term 'class size' is very specific. It differentiates purpose of subject (school chorus vs. chemistry laboratory); pedagogical style (group lecture vs. small-group work); and learning demand (the handicapped vs. others). Pupil/teacher ratios represent a broad average across the system. It is the pupil/teacher ratio to which the economist usually means to refer. On the other hand, pupil/teacher ratios are inadequate unless there is evidence on the range of ratios being considered in the sample and differentiations between teaching/non-teaching employees.
 14. It is true that multi-level analytic methods of disaggregation have represented a major advance. But it is also true that they have not been able yet to distinguish intervening influences which occur during the investment period itself. Since it is widely recognized that changes in some classrooms will be more radical than in others, current methods of measuring net gains over time would be unlikely to stand up in a court of law on the basis of being able to distribute resources 'fairly'.
 15. This requirement is similar to the standards recommended by the National Academy of Sciences for conducting international research in education (Board on International Studies in Education, 1993).

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