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Curricular economics in secondary education: an emerging crisis in developing countries*

Stephen P. Heyneman

Origins

Everybody agrees that secondary schooling should be 'practical'. Disagreement arises over what constitutes practicality and how one demonstrates that it has the effect that one claims for it. Some argue that since financial resources are limited, the most 'practical' curriculum is one where students concentrate—even limit—their education actually to using tools; where students produce something tangible—an agricultural plot, a fishing boat, a piece of furniture. Others feel that since choices have to be made, first priority should be placed upon the cognitive skills generalizable across occupational categories—in particular those of mathematics, science and language. This

classic difference of opinion over what constitutes the 'most practical' education was personified among American educators by the famous W. E. B. du Bois/Booker T. Washington debates in the 1920s and has been played out in countries as diverse as the United Kingdom, Tanzania, China and Brazil.

In part the disagreement has reflected a misunderstanding of terms. Some have used the term 'practical' when what they really meant was 'concrete' (i.e. real to the student); others have used the word 'practical' when what they really meant was 'manual' (i.e. skills involving manipulation of tools). And still others have used the word 'practical' when what they really meant was 'applied' (i.e., ideas that could be directly utilized, which may or may not be manual). Problems have emerged when the notion that a practical curriculum constituted one of its many subsets, the teaching of manual skills appropriate to specific vocations. These problems have been particularly severe in secondary education in developing countries where these terminological misunderstandings have led to serious economic costs.

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* The views and opinions expressed in this article represent those of the author alone. They do not necessarily represent those of the World Bank or any of its affiliated institutions.

There have been four basic arguments to advance the belief that a 'practical' secondary school curriculum is one that consists of manual work:

Economic. To meet the economic demands of the labour market by providing sufficient training in manual skills so that school leavers would have an advantage when trying to earn a living.

Educational. To generate vocational interests so that they might be pursued during leisure time (not necessarily for payment). The same rationale is used to justify physical education, art, and music as essential ingredients of a 'well-rounded education'.

Cultural. To change what are widely perceived to be irrationally negative attitudes held by young people against manual work or a rural livelihood. This is particularly relevant in Asia where youth of certain castes believe they have inherited certain occupational functions; but the rationale for breaking-down inappropriate attitudes towards work is worldwide.

School income. Since secondary schools have always been expensive, and since the cost of student labour has always been assumed to be low, many educators and politicians have argued that 'productive activities' in schools would offset the school's recurrent costs. Examples have included farm production, small-scale manufacturing, community service (for a fee) and sale of tickets to school sports and artistic functions.

These arguments justifying manual skills as being part of the practical curriculum have been present in one form or another since the beginning of the century, and have recently played a large role in 'diversifying' curricula in the 1960s, including international assistance from multilateral and bilateral development assistance agencies. By and large, the official policy of these agencies had not excluded other notions of practicality explicitly. But it has been fashionable to denigrate the usefulness of academic skills. Words such as 'theoretical' and 'academic' were typically used pejoratively. No agency could argue the wisdom of elimin-

ating science and arithmetic from a curriculum. Instead their policies have been to support all curricular emphases through a single institution—the diversified secondary school. Reasons differed, however, from one historical context to another.

For example, following the Second World War the educational community in Europe and the United Kingdom engaged in a debate over 'comprehensive' school reforms. In essence the issue was whether specialized grammar schools (geared to university entry) and vocational schools (which were terminal) should be merged into a single institution. Political conservatives generally argued that comprehensive schools for all would lower academic standards; liberals and socialists argued that comprehensive schools were necessary to achieve equal opportunity for all children regardless of social background. Comprehensive schools were also started in Europe simultaneously with expanding secondary-school opportunity to larger portions of the relevant age-group. Thus the diversified curriculum had a 'progressive' image, because it coincided with a higher percentage of working-class youth at school. In the early 1960s European and British development agencies included these two assumptions of what was the 'appropriate' curriculum in their assistance programmes to developing countries.

The assumptions of the educational community in North America were different. There, comprehensive schools had always been part of the traditional pattern. All enrolled students had access to university. Terminal secondary schools were unknown. What North American educators brought to developing countries in the early 1960s, therefore, was the assumption that wide subject choice was normal and that all vocational subjects were appropriate in all schools. Despite the fact that many developing countries had as little as 2 per cent of the relevant age-group enrolled in secondary schools in the early 1960s, diversified curricula—adding anywhere from 30–50 per cent more in unit costs—were supported in developing countries by the North Americans not

because it was new or revolutionary, but because it traditionally constituted a good 'all-round' education.

Errors in assumptions

The single most common error in educational planning has been to assume that a curriculum in science, mathematics, history and language, which is designed for those pupils who continue beyond secondary school, is 'impractical' (in this context, not useful) for those who do not continue. The reasoning assumes that a curriculum which prepares students for further education is too theoretical. It assumes that a curriculum that teaches vocational skills is more useful than a curriculum that teaches general skills. If this were so, then carpentry would be more useful for drop-outs than mathematics. This assumption may or may not be true, but when it is not true, the mistake can be expensive.¹

That secondary school 'vocationized' curricula are more fitted to developing countries is a questionable notion.² It is true that specialized vocational training for a small percentage of secondary-school students has been a valuable component of education systems, particularly in urban, middle-income countries with diverse labour markets. But as an assumption, the belief that vocational curricula added to core subjects in general secondary schools are *ipso facto* more practical, is simply tacit.

Generalized schooling has played a prominent role in the economic development of the recently industrialized societies, particularly because of the technological and scientific impact on occupations.³ It is also clear that parents are a good barometer of curricular choice, and parental interests have been known to conflict with the emphasis on manual skills, which planners believe to be for the benefit of students.⁴

Terminological misunderstandings: the impact in developing countries

Since the middle 1960s, international assistance has been reaching secondary school classrooms but this assistance has been predominantly aimed at so-called 'practical' subjects—wood- and metal-work, domestic science and agricultural science. The problem has not been the virtues of these subjects as components of an 'all-round' education, but rather the lack of attention to practical requirements: (a) the large amounts of chemicals, tools, timber, metal and other consumable materials required; (b) the cost of these materials; (c) the degree of teacher training necessary; and (d) the availability of a constant supply of affordable water, electricity, etc. Frequently these requirements are not present. As a result, in many countries one can see 'graveyards' made up of workshops and laboratories. Equipment lies mouldering in corners. In some cases this 'practical' equipment has been given first priority and has been delivered to secondary schools having no library, no textbooks, no geography maps, in fact none of the essential materials for teaching basic subjects. Thus, not only is the strategy of curricular diversification problematic in terms of implementation, but it is conceptually imbalanced. Raising basic cognitive skills has been by-passed in favour of assisting manually specific skills.

One problem has been that of public authorities, whose staff are not educational professionals yet who call for educational reforms. If there is a societal problem not easily amenable to other solutions, schools are called upon to sort it out. If crime figures increase, schools are called upon to teach more morality. If there are more traffic accidents, schools should teach more road safety. If there is too much drinking, schools should teach more about temperance. If there is too much urban drift or too much unemployment and not enough respect for manual occupations, schools should teach more 'practical' subjects.

Another problem has been that some curriculum specialists have argued that students need to have 'hands-on experience' before they can understand a theory, that students need to be able to solder to understand mechanics, that they must be able to perform a laboratory experiment to understand science. Moreover, some curriculum specialists and certain political authorities, continue to force these functions on schools, when it should be clear that the schools' resources are inadequate to the task. Curricular objectives are decided independently of the school's capability to perform them. More subjects and wider educational objectives are being assigned without any recommendation about what should be discarded to accommodate additional subjects. This is true in both developing and industrialized countries; there is no sense of curricular economics.⁵ There is also a virtual and embarrassing absence of curricular economics in the educational literature.

What can the educational planner do?

By what means can a planner clarify this debate and so protect the school system from being overburdened with unobtainable objectives? By what means can curricular objectives be identified, which would instil the kinds of knowledge and skills most effective for work productivity?

If there is a call for more agriculture, or metal-work or auto mechanics education in secondary schools there might be at least four sources from which evidence could be drawn to assess the impact of the additional practical requirements.

The first source is the degree of public demand for specific subjects. Parents are one of the most important sources of demand. Children are encouraged to attend secondary school for many reasons, but one of them is always economic. At the very least, rural parents aspire to have their children learn the skills necessary for them to raise their level of ability within the agricultural sector.⁶ Secondary

schools cannot be expected to change parental aspirations; however, they can use these aspirations to motivate learning; but to do that the school curriculum must reflect those aspirations.

If a secondary school emphasizes one of these additional subjects at the expense of a 'core' subject, such as science, it is likely to go against normal public demand. Of course public demand can be ignored; or worse, student aspirations can be described in a derogatory fashion—as 'seeking education for the sake of certificates', 'infatuation with white-collar employment', 'a desire to avoid manual labour' or a 'desire for the bright lights of the city'. But the fact remains that a better life is associated with more and better schooling. Many parents sense that the knowledge required for advancement depends upon a thorough theoretical grounding. If the emphasis in the curriculum appears to contradict what students and parents regard as common sense with respect to upward occupational mobility then the curriculum will be considered inefficient and ineffective. If this occurs, workshop equipment is likely to gather dust in the corner, uncared for and uncared about.⁷

The second source is cost. Two types of costs are involved: monetary and cognitive. Monetary costs are calculated by adding up all equipment and facilities needed, the consumable supplies to run them (wood, electricity, etc.) and the costs of teacher training and teachers' salaries necessary to implement the additional subjects. In the end the sum of these various costs for teaching additional subjects must be compared with the cost of improving one of the core subjects, such as mathematics. In some countries the additional curriculum for manual skills is likely to add 40 per cent to normal unit recurrent costs.⁸ Cognitive cost is calculated by estimating the change in learning which may result from taking time away from one subject to study something else. Time spent on domestic science and metal-work is time not spent on arithmetic and language. Is performance in the latter adversely affected by introducing new

TABLE 1. The relative unit cost of secondary-school curricula, 1980s

Country	Curricula			
	Non-occupational	Agricultural	Commercial	Technical/industrial
Colombia	100	119	101	125
Tanzania	100	119	109	113
Malaysia	100 ¹	— ²	163	163
Barbados	100 ¹	139	158	142
Jordan	100	— ²	— ²	196

1. The non-occupational index base in Barbados and Malaysia refers to English as a subject.

2. Figures not available.

Source: George Psacharopoulos, *To Vocationalize or Not to Vocationalize: That is the Curriculum Question*, Washington, D.C., The World Bank, 1986. (Economic Development Institute Division Paper.)

curricular diversification? Where curricular diversity has led to a 'cafeteria of subjects' and where there has been no discipline or priority placed on which subjects are more important, the result has been a significant sacrifice of core subjects. This is apparently what happened in the United States in the 1960s and 1970s.⁹

As to how much additional subjects have cost in developing countries, it depends upon how often they are taught, what equipment is necessary and the number of specialized teachers required. Data are very difficult to obtain and often unreliable. However, in Tanzania and Colombia, for example, they have been found to be 20 per cent higher than the typical (non-laboratory) academic subject, and in Barbados 39 per cent higher (Table 1).

Commercial subjects appear quite variable in recurrent costs depending upon the kind of equipment used. Their costs have been found to range from approximate parity in Colombia and Tanzania to 63 per cent higher in Malaysia. Technical and industrial subjects appear to be the most costly, ranging from 13 per cent higher in Tanzania to over 90 per cent higher in Jordan. Capital costs also differ by specific curricula. Capital costs of science laboratories are often double that of ordinary classrooms; industrial arts costs can be five or even seven times higher. Examples of these are displayed in Table 2.

TABLE 2. The relative capital cost of classrooms, 1980s

Country	Non-occupational classroom	Science classroom and laboratory	Industrial arts classroom and workshop
Malaysia ¹	100	467	— ³
Barbados ¹	100	243	695
China ¹	100	480	— ³
Jordan ¹	100	203	614
Kenya ²	100	— ³	550

1. Refers to furniture and equipment cost.

2. Refers to construction cost.

3. Figures not available.

Source: George Psacharopoulos, *To Vocationalize or Not to Vocationalize: That is the Curriculum Question*, Washington, D.C., The World Bank, 1986. (Economic Development Institute Division Paper.)

What this implies is that the effectiveness of these subjects has to be several times higher than the core subjects to justify them on cost grounds.

A third source of evidence to justify added subjects in a curriculum are the potential economic benefits. For instance, it is argued that learning auto mechanics in general secondary schools will lead to greater post-school productivity. But is learning auto mechanics more productive (for the same student) than learning physics? What if it came to a choice between one and the other? Learning auto

mechanics is likely to be the more productive when the student emerges with a license to practice, such as in public accountancy or teaching. But if every secondary school student learns auto mechanics the economic returns are likely to be low. Having all secondary school students learn a physics curriculum is likely to be a better investment than having them learn auto mechanics.¹⁰ Knowing how to repair an automobile is important for personal satisfaction. But if students first become familiar with science, they can learn the principles of how an automobile works more easily than those who are taught how to repair an automobile, and later learn the principles of science.¹¹ This can be translated into economic returns. If social status and personality factors are held constant, students who understand science are likely to be more employable than those who understand auto mechanics. In this case, in economic terms science is the more 'practical' subject in that it would appear to be the most useful.

In fact when cost/benefit studies are carried out, the rate of return from core subjects of general science, mathematics and language are often higher than from additional of agricultural, industrial, or commercial subjects.¹² This is illustrated in Tables 3 and 4. The rate of return from non-vocational curricula in Colombia is about on a par with that from vocation-specific curricula, but the economic returns from non-vocational curricula in Tanzania is slightly higher than from agricultural curricula; and three times higher than from industrial or technical curricula (Table 3). In terms of separate vocational schooling the economic evidence is perhaps more consistent, with economic returns from non-vocational curricula usually appearing 25-30 per cent higher than the returns from vocational education. In Indonesia, for instance, the rate of return from vocational education is 18 per cent; while from academic education it is 32 per cent. The return from vocational education in Liberia is 14 per cent, and from academic education it is 20 per cent (Table 4). There are exceptions to be sure; and there are certainly structural

TABLE 3. Rates of return from non-occupational and occupation-specific curricula¹

Subject	Colombia		Tanzania (%)
	INEM school (%)	Traditional school (%)	
Non-occupational	7.7	9.3	6.3
Agricultural	9.1	7.2	5.4
Commercial	8.4	9.3	3.2
Industrial/technical	9.2	9.9	1.7

1. Based on earnings adjusted for ability and socio-economic factors.

Source: George Psacharopoulos, 'An Evaluation of Curriculum Diversification in Colombia and Tanzania', *Comparative Education Review*, Vol. 29, No. 4, 1985, pp. 522-3.

TABLE 4. Rates of return to vocational and non-vocational secondary education

Country	Year	Non-vocational (%)	Vocational (%)
Cyprus	1975	10.5	7.4
	1979	6.8	5.5
France	1970	10.1	7.6
Indonesia	1978	32.0	18.0
Liberia	1983	20.0	14.0
Taiwan	1970	26.2	27.4

Source: George Psacharopoulos, in *Comparative Education Review*, 1985, p. 253.

reasons (wage policy, etc.) to explain such results. Like most areas in the social sciences, data are not ideal, not up-to-date and suffer from reliability problems. But the economic evidence on the exposure to differing kinds of curricula cannot be ignored. It can no longer be safely assumed that additional subjects, specific to a manual occupation, will be an advantageous investment on the part of society, or the individual.

Curriculum crisis in developing countries

In the 1960s and 1970s there was a significant level of educational rhetoric about needs. Students 'needed' to learn this or that. Issues of curriculum cost, demand and implementation feasibility were considered to be of secondary importance. That period of uncritical examination is now over.

Developing countries already devote a substantial portion of their recurrent budgets to education. Currently in Benin it is 36 per cent; in Mali 33 per cent; in Malaysia 26 per cent—but over 90 per cent of this investment has to be allocated to teacher salaries. Consequently, as more and more students enter school, there are fewer and fewer materials to teach them with.

In 1960 the typical high-income country was

able to invest fourteen times more per student than did the average developing country; but five years later the ratio had risen to 16 : 1; ten years later it was up to 22 : 1. Today, it is 50 : 1. The average (primary-school) student in an industrialized country is exposed to fifty times the level of recurrent cost investment as a student at the same grade in a low-income country.

Figures for recurrent non-salary (physical) costs per student reflect those for total recurrent costs. Non-salary costs include everything else necessary to make a classroom operational—books, maps, chalk, furniture, etc. The current fiscal situation is displayed in Figure 1.

By contrast, Italy invests \$75 per pupil in classroom supplies; the Netherlands and the United States invest \$220 per pupil; some countries, such as Sweden, invest over \$300 per pupil. In practical terms this means that one

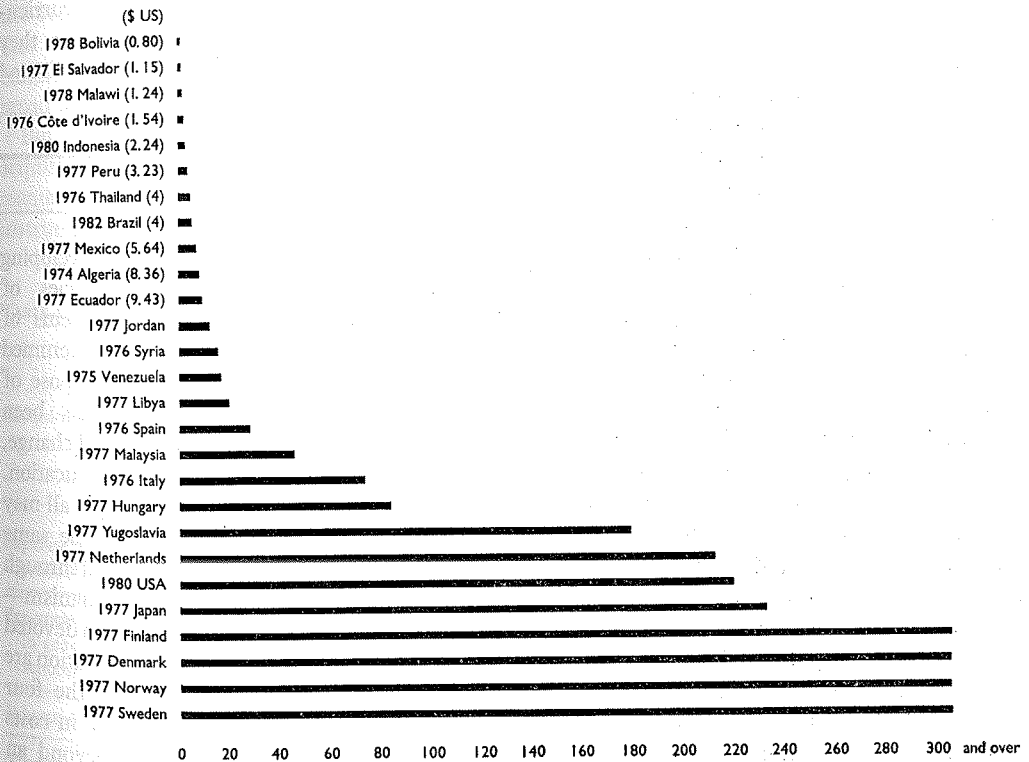


FIG. 1. Value of classroom materials and other non-salary recurrent investment per student enrolled in primary schools (after Education Department, World Bank)

out of three (elementary) pupils in the United States now has access to a computer; 97 per cent of the (elementary) schools in Japan have a tape recorder, 27 per cent have a colour video camera, and virtually all schools in Japan have an overhead projector, a slide projector, and an 8-mm projector. In the United States there were 71,000 school libraries in 1978; each (primary) pupil had access to fourteen titles, in addition to textbooks, reference books and visual aids. For every primary-school pupil in the United States in 1978, \$34 was spent in library supplies.

The availability of classroom materials in the developing world is very different. In 1977, taking one developing country as an example, there were ten pupils for each available (primary) school textbook. Thus, pupils in the United States have in the range of 140 times the amount of reading material put at their disposal. In 1979, in another developing country, only one pupil in eight even had a chair, and only one in eighty-eight had a desk.¹³ Schools in many developing countries are without enforced safety standards. Walls have been known to collapse after a rainfall; roofs have holes in them, where wind and storms disrupt classroom activity as a matter of course.

Differences in school quality 'inputs' are translated into wide differences in learning achievements. The average performance in reading comprehension and in science of a primary-school student from a developing country has been found to fall in the bottom fifth to tenth percentile of the scores across all countries. In one sample of school achievements in twenty-five high-, medium- and low-income countries, the correlation between level of economic development and level of school achievement is strong and statistically significant ($r=0.55$; $p<0.001$). This suggests that the wealthier the country in economic terms the greater the cognitive skills in the core subjects acquired at the end of the primary-school cycle.¹⁴ These lower achievements found at the first level of schooling then affect the quality of student intake at the second level, and later, in higher education.

The phrase has been overused, but we do appear to be in a 'world education crisis'. Ceilings on educational expenditure have been reached; the demand for schooling is high and is constant; authorities—on all sides of the political spectrum—are under pressure to expand educational opportunity; and quality is being sacrificed.¹⁵ In Latin America, for instance, the monetary investment per secondary student fell in real terms by 20 per cent between 1970 and 1980.¹⁶ Similar declines are likely to have occurred in Sub-Saharan Africa. Although monetary costs per student appear on the rise in the Middle East and in East Asia, nowhere in developing countries has the increase been able to match the per student increases that have occurred in the industrialized countries.

Economic problems of this magnitude imply that educational officials will have to scrutinize the priority they place on each one of their educational objectives. Among many other problems they will have to consider are curricular priorities. Are they too broad? Are they overly complex in depth? Are they delivered through the most efficient instruments?

Choices

Despite economic problems many developing countries are proceeding with policies of 'vocalization'. In the past, problems of implementing vocalization have stemmed from a confusion of purpose. The purpose of teaching specific vocational skills has been mixed up with the purpose of attitudinal change, or with providing a general all-round education. All of these objectives are legitimate but all may not be necessary for all students at the same time; nor need all objectives be delivered through the most expensive educational mechanism—that of having a specialized curriculum devoted to them. If the purposes of vocalization are not carefully evaluated according to the four sources mentioned above, the increase in costs may stretch the education system beyond an acceptable level, and may sacrifice not only the vocalization programme but the main-

tenance of the school system as a whole. Unrealistic objectives in one part of the system can lower the general quality.

One way to avoid this mistake is to define the purposes of vocationalization more carefully—for what portion of students and by what instrument of implementation. Such instruments might include a vocational school or an additional subject in an academic school, or it may include an activity organized by the community outside the school system altogether. An illustration of four such options, ranked according to their different monetary costs, appears in Table 5. For instance, if the purpose is to have students learn specific vocational skills, the most effective option would be that of a separate vocational school for a small percentage of secondary-school students. An additional subject in a general secondary school taught to a high percentage of secondary school students is likely to be very inefficient and very ineffective for teaching vocation skills. The exposure may be too shallow to allow for much learning and the coverage of students too broad to focus on those with special aptitudes.

But if the main purpose is to have all students acquire different cultural attitudes toward manual work, there are many educational instruments available to achieve this, some in

the curriculum; others outside of the school altogether. It may be a mistake to choose the most expensive instrument in this case. The 'education with production' alternative has varying costs attributed to it because the actual economic results from such endeavours are idiosyncratic. In many instances the costs of production activities have been found to be higher than the monetary returns. In this case the production activities become one among a long list of possible subjects justified on grounds that it would be 'important for young people to know'. The point is that we should not expect additional subjects added to a core curriculum to accomplish all objectives either well or cheaply. Their main justification is that they help provide a good all-round education.

There is such a thing as curricular extravagance. The content of a good all-round education in one country cannot be assumed to be applicable everywhere. Moreover, it cannot be assumed that specific vocational skills are a necessary ingredient. The issue, then, is how to choose what is appropriate, affordable and feasible.

Educational planners should ensure that a curriculum does not duplicate knowledge that can be acquired more effectively out of school;

TABLE 5. Vocational purposes, costs and instruments

Educational investments	Estimated actual cost ¹	Principal purpose			
		Learn specific skills for the labour market	Change cultural attitudes towards manual work	Reduce public cost of secondary schooling	For general educational interest
Separate vocational schools	200	×	×		
Pre-vocational subjects in general academic schools	150		×		×
Educational production	Variable		×	×	
Work experience	0.50		×		

1. Arithmetic unit cost/contact hour = 100.

that a curriculum is consistent with parental aspirations, that it is affordable in both monetary and cognitive costs; and that the economic benefits are higher than rival subjects.

The core subjects of mathematics, science and language, which do not include specific vocational skills, are economically competitive to the additional subjects of vocationally specific curricula, and there are four good reasons to concentrate attention specifically on them in the general secondary schools:

Because these particular subjects are valued at the national level, excellence in them is required before a child can enter post-secondary institutions. Special intervention in these subjects increases the chance for less-privileged children to continue beyond the next selection examination. Any assistance in these subjects is consistent with local aspirations and is supported by parents and by local education officials, without reservation.

Because the quality of teaching in these particular subjects is unequally distributed, disadvantaged regions can be identified by their lack of highly educated teachers, their paucity of facilities and by their low test performance. The improvement of disadvantaged regions can be monitored by the same criteria.

Because mathematics and science have international value and political priority, general competence in these subjects creates a population which can adjust quickly to rapid technological change. Educators are only too aware that children in some societies learn less than children in others. This difference in knowledge can only exacerbate the technological gap between rich and poor countries, and between rich and poor districts within countries.¹⁷ Planners are receptive to amelioration efforts in maths and science. Countries aspire to be internationally competitive, to develop their own technologies, and to have their own citizens available who can keep up with the pace of technological change. More than anything else this depends upon the intellectual adaptability of a country's labour

force, and this, in turn, has implications for curricular priorities.¹⁸

Because it is very often the case for those rural children who do not attend secondary school, who stay in rural areas, and who participate in agriculture, that over the next four or five decades of their life-span their exposure to high-quality mathematics, science and language will help them to learn more quickly and to be more economically productive in agriculture than would exposure to a simplified curriculum in farming skills adapted to a secondary-school classroom. Even for these children, who will remain farmers, generalized subjects are the best investment in the long run. Before educators decide that rural children should have rural-skills training they should carefully add up the economic costs and returns. If only a superficial effort is made to gather the necessary facts, deciding to teach rural children less science, mathematics and language can eventually prove to be a costly decision, both for the country and for rural children. The latter would be disadvantaged by two standards: equity and long-term economic efficiency. ■

Notes

1. The origin of this error can be traced to educational reformers in the nineteenth century who were still struggling with the remnants of medieval curricular requirements in the grammar schools and gymnasia of Western Europe; i.e. the requirements of Latin and Greek which had been established before the scientific revolution. In the twentieth century the same arguments (against a literary curriculum) were transferred to Africa and Asia via colonial and missionary specialists. This transfer of complaint was made despite the fact that the situation had completely changed. The requirements for further education were not necessarily Latin and Greek, but science, modern languages, and mathematics. This same assumption—that subjects that prepare students for movement up the educational ladder are irrelevant for other students—continues to be made in the post-colonial era and is common to all development assistance agencies, both bilateral and multilateral.
2. P. Foster, 'The Vocational School Fallacy in Development Planning', in C. Arnold Anderson and Mary

- Jean Bowman (eds.), *Education and Economic Development*, Chicago, Aldine Publishing Company, 1966, pp. 142-7.
3. C. A. Anderson and M. J. Bowman, 'Education and Economic Modernization in Historical Perspective', in Lawrence Stone (ed.), *Schooling and Society: Studies in the History of Education*, Baltimore, Johns Hopkins University Press, 1976, pp. 3-19; J. Goody and I. Watt, 'The Consequences of Literacy', in J. Goody (ed.), *Literacy in Traditional Societies*, Cambridge, Cambridge University Press, 1968.
 4. S. P. Heyneman, *The Conflict Over What is Learned in School: A History of Curriculum Politics in Africa*, Syracuse, N.Y., Maxwell School of Citizenship and Public Affairs Monograph, 1971. S. P. Heyneman, 'Career Education: Where the Differences Lie', *Teachers College Record* 80, May 1979, pp. 659-88. D. Court, *Education as Social Control: The Response to Inequality in Kenya and Tanzania*, Nairobi, Institute of Development Studies (Discussion Paper No. 277), June 1975. C. Colclough and J. Hallak, *Some Issues in Rural Education and Educational Equity, Efficiency and Employment*, Paris, International Institute for Educational Planning, 1975.
 5. When an economy is expanding, educators lead the public to believe that there is no limit to the amount of important subject matter. But when an economy is flat, the public begins to question the wisdom of the educators and starts to enforce curricular priorities of its own. See J. S. Catterall and E. Brizendine, 'Proposition 13: Effects on High School Curricula, 1978-1983 (in California)', *American Journal of Education*, May (1985), pp. 327-51.
 6. Item 3, Article 26 of the United Nations Declaration of Human Rights is not cited often enough. It says that 'Parents have the prior right to choose the kind of education that shall be given to their children'.
 7. Of the 90 secondary education projects assisted by the World Bank the rate of utilization of workshop facilities is 58 per cent. In 40 per cent a new curriculum is 'unavailable'; in 75 per cent equipment is reported as having maintenance problems and an average utilization rate of 47 per cent. One half experience problems of teacher availability; one out of three report a lack of materials and supplies; S. P. Heyneman, 'Diversifying Secondary School Curriculum in Developing Countries: An Implementation History and Some Policy Options', *International Journal of Educational Development*, Vol. 5, 1986, pp. 283-8.
 8. Higher unit costs result from higher costs of laboratory and workshop equipment and smaller pupil/teacher ratios.
 9. United States Department of Education, *A Nation At Risk*. Washington, D.C., US Printing Office, 1985.
 10. Auto mechanics can, of course, be effectively used to illustrate some principles in physics. The goals of a school must be separated from the pedagogy chosen to teach them. Good teaching in all subjects requires examples and techniques which are relevant and meaningful. And students differ by groups and by individuals on the basis of what is meaningful.
 11. C. A. Anderson, 'Fostering and Inhibiting Factors', in C. S. Brembeck and Timothy J. Thompson (eds.), *New Strategies for Educational Development: The Cross Cultural Search for Non-formal Alternatives*, Lexington, Mass., D.C. Heath, 1973, pp. 25-40.
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18. Just because a curriculum is essential does not mean that it should be taught in an extravagant manner. For example there is some doubt as to whether performing a laboratory experiment is a necessary ingredient of a secondary school general science programme. See M. Mundangepfufu, *Pros and Cons of Using Secondary School Science Laboratories in Africa*, World Bank Education Department, 1986. (Discussion Paper Series).