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Illustration: cover, and pp. 8, 15, and 20, Richard Downs.

Photography: p. 3, Sajjad Hussain/AFP; p. 5, Damien Meyer/AFP; p. 7, "Children's Games by Pieter Bruegel the Elder," Francis G. Meyer/Corbis; p. 26, Liba Taylor/Corbis; p. 29, Amit Dave/Reuters; p. 34, Patrick Ward/Corbis; p. 38, James Marshall/Corbis; p. 42, Cindy Karp/Time Life Pictures-Getty Images; p. 47, Marcos Brindicci/Reuters; p. 50, Evaristo Sa/AFP; and pp. 53, 54, and 56, IMF photo unit.

Five down, ten to go

IN 2000, THE GLOBAL community pledged at the UN Millennium Development Conference to achieve universal primary education (UPE) by 2015—one of eight goals that would represent a comprehensive reduction in global poverty. Five years later, only East Asia and the Pacific, and Latin America and the Caribbean are close to achieving the UPE goal, and sub-Saharan Africa, home to many of the world's poor, lags far behind. What's holding up progress? This issue of *F&D* takes stock of the enormous gains on the educational front over the past century and examines what needs to occur now for education for all to become a reality.

We begin with the results of a just finished multi-year project for the American Academy of Arts and Sciences on universal basic and secondary education. The project co-directors, Joel Cohen (Rockefeller and Columbia Universities) and David Bloom (Harvard University), consider the additional cost of reaching UPE by 2015—estimates range from \$6 billion to \$35 billion per year—not only affordable but essential for providing economic benefits, building strong societies and polities, and improving health. They also emphasize that reaching UPE is about a lot more than money: many of the chief obstacles lie in the political, cultural, informational, and organizational domains. And they insist this goal isn't ambitious enough. "The world should aim for, and can achieve, high-quality, universal secondary education, possibly by 2015 but certainly by the middle of the 21st century."

F&D's education issue also looks at the importance of achieving high-quality education for future economic and social gains—although the rate of uptake of well-established ways of improving schooling remains uncomfortably low. And we explore the successes emerging from India's quiet revolution in elementary education, the need for sub-Saharan Africa to shift its focus from increasing admissions to reducing dropout rates and improving learning outcomes, how policymakers can create budget space for social outlays and make these outlays efficient, how tertiary education can be funded, and how foreign aid can be made smarter. Several *F&D* contributors argue that aid must be given in cycles of 5–10 years, rather than 2–3 years, and suggest that adopting incentives based on results could boost aid's effectiveness.

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In *Straight Talk*, IMF Chief Economist Raghuram Rajan tackles one of the hottest issues in international economic circles: how to craft an optimal debt relief proposal for low-income countries. He says that the proposals currently on the table have a one-size-fits-all flavor, but this is unfortunate because "one-size-fits-all proposals, while politically more convenient, are unlikely to benefit recipient countries as much as proposals that tie debt relief and additional aid to a country's specific situation"—such as whether the government is corrupt and whether it has access to private markets. Incidentally, his previous column on odious debt has generated some strong reactions: see our *Letters* section.

In *People in Economics*, we profile Mario Monti, an Italian professor and new think-tank head, who became a prominent European Union Competition Commissioner—known for his clashes with General Electric and Microsoft over issues of market power.

Laura Wallace
Editor-in-Chief



Cultivating Minds

Joel E. Cohen and David E. Bloom

OVER the past century, three approaches have been advocated to escape the consequences of widespread poverty, rapid population growth, environmental problems, and social injustices. The *bigger pie* approach says: use technology to produce more and alleviate shortages. The *fewer forks* approach says: make contraception and reproductive health care available to eliminate unwanted fertility and slow population growth. The *better manners* approach says: eliminate violence and corruption; improve trade, the operation of markets, and government provision of public goods; reduce the unwanted aftereffects of consumption, such as environmental damage; and achieve greater social and political equity between young and old, male and female, rich and poor (Cohen, 1995).

Providing all the world's children with a high-quality primary and secondary education, whether through formal schooling or by alternative means, could, in principle, support all three of these approaches. Education provides economic benefits (see "Why Quality Matters in Education" on page 15 of this issue), builds strong societies and polities, and improves health. It is also a widely accepted humanitarian obligation and an internationally mandated human right.

The good news is that over the past century, access to education has increased enormously, illiteracy has fallen dramatically, and a higher proportion of people are completing primary, secondary, or tertiary education than ever before. But huge problems remain. About 115 million children of primary school age are not

currently enrolled in school. Most are illiterate and live in absolute poverty; the majority are female. Some 264 million children of secondary school age are not currently enrolled. Large educational disparities exist within and between countries. The quality of schooling is often very low. Moreover, demographic projections suggest that developing countries will have 80 million more children of primary and secondary school age (typically 6–17 years old) by 2025 than now—an increase of 6 percent to 1.35 billion.

In 1990, the global community pledged at the World Conference on Education for All in Jomtien, Thailand, to achieve universal primary education (UPE) and greatly reduce illiteracy by 2000. In 2000, when these goals had not been met, it repeated the pledge, this time at the World Education Forum in Dakar, Senegal, with a target date of 2015. The UN Millennium Development Conference in 2000 also adopted UPE by 2015 as one of its goals, along with the elimination of gender disparities in primary and secondary education by 2015. But even the modest UPE goal now looks unlikely to be achieved by 2015 at the current rate of progress. An estimated 335 million school-age children will be missing primary or secondary school in 2015; of these, an estimated 118 million will be absent from primary school. About one in five of these children will never enroll in or attend school.

Given this series of missed targets, what is feasible? Estimates are that UPE can be achieved by 2015 if the global community invests another \$6 billion to \$35 billion per year, on top of the approximately \$82 billion developing countries already spend each year

Educating all children well is not only urgent but also feasible within the next few decades

on primary education. This article argues that this sum is not only affordable but essential. It also argues that the UPE goal is not ambitious enough: the world should aim for, and can achieve, high-quality, universal secondary education, possibly by 2015 but certainly by the middle of the 21st century. The price tag for achieving this goal might be an additional \$27 billion to \$34 billion per year starting now, on top of the approximately \$93 billion developing countries already spend each year on secondary education. However, the obstacles are not just financial. Leaders need to devise and implement policies that will make educating children unquestionably worthwhile, in the eyes of parents and everyone else.

Education today

How is the global community doing in enrolling more children in school? Are educational data reliable and useful for international comparisons?

The good. Remarkable progress has been made in formal schooling over the past century, especially as measured by the primary gross enrollment ratio (GER)—the ratio of the number of children enrolled in primary education, regardless of age, to the population of the age group that corresponds to the nationally defined ages for primary schooling.

- In 1900, estimated primary GERs were below 40 percent in all regions except northwestern Europe, North America, and Anglophone regions of the Pacific, where the ratio was 72 percent (Williams, 1997). But by 2000, the estimated global primary net enrollment ratio (NER)—the ratio of the number of children in the official primary school age group enrolled in primary education to the population of the primary school age group—had reached 85 percent globally. The NER is a stricter standard than the GER, so the achievement is all the more remarkable.

- In developing countries, literacy tripled in the 20th century, from 25 percent to 75 percent, and the average years of schooling more than doubled between 1960 and 1990, increasing from 2.1 to 4.4 years (Bloom and Cohen, 2002). That figure has risen further since 1990.

- The number of students enrolled in secondary school increased tenfold in the past 50 years, roughly from 50 million to 500 million.

As for data quality, developing countries have begun to participate in international measurements of educational status in greater numbers. Even so, more statistical measures of schooling have been defined (for example, net and gross enrollment ratios, attendance rates, completion rates, average years of attainment, and school life expectancy) than are well supported by reliable, internationally comparable, and comprehensive data. The UNESCO Institute for Statistics, Montreal, maintains the highest-quality data (for example, UNESCO, 2000, 2004).

The bad. While progress is being made, colossal shortfalls remain.

- Roughly 380 million children are not enrolled in school (28 percent of the age group, typically 6–16).
- More than one-fourth of these children are absent from primary school (with the rest missing secondary school).

- Of school-age children who enter primary school in developing countries, more than one in four drops out before attaining literacy (World Bank, 2002).

Moreover, enrollment does not necessarily mean attendance, attendance does not necessarily mean receiving an education, and receiving an education does not necessarily mean receiving a good education. Thus the high enrollment ratios may give the mistaken impression that a high proportion of school-age children is being well educated. Some 75–95 percent of the world’s children live in countries where the quality of education lags behind—most often far behind—the average of industrial countries, as measured by standardized test scores. That standard may not be universally appropriate. However, it is uncontested that educational quality is too often poor.

On the data front, indicators of educational quality are scarce. Though participation in international and regional assessments of educational quality has increased, countries most in need of improvements are least likely to participate.

The ugly. Gross disparities in education separate regions, income groups, and genders.

- The populations farthest from achieving UPE are typically the world’s poorest. In sub-Saharan Africa, the primary NER is only 63 percent—far below the 96 percent in Latin America and the Caribbean (see Table 1).

- Girls’ education falls short of boys’ education in much of the world. While enrollment rates sometimes do not differ greatly, many more boys than girls complete schooling, especially at the primary level.

A systematic global analysis remains to be done, region by region, of how much gender, urban or rural residence, and high or low income contribute to differences in children’s educational opportunities and achievements, but we know they interact. In India in 1992–93, for example, the enrollment rate of boys ages 6–14 exceeded that of girls by 2.5 percentage points among children of the richest households; the difference in favor of boys was 24 percentage points among children from poor households (Filmer, 2000). Girls are

Table 1

Joining school

Net primary enrollment ratios have advanced in most of the developing world but remain low in sub-Saharan Africa.

	1990	1998	2002
World	82	84	85
Countries in transition	89	85	89
Developed countries	96	97	96
Developing countries	80	82	83
Arab states	75	78	83
Central and Eastern Europe	90	87	89
Central Asia	85	89	90
East Asia and the Pacific	96	96	92
Latin America and the Caribbean	86	94	96
North America and Western Europe	97	96	95
South and West Asia	73	79	83
Sub-Saharan Africa	55	56	63

Source: UNESCO Institute for Statistics.

Note: Net primary enrollment ratio (in percent) is defined as the ratio of the number of children in the official primary school age group enrolled in primary education to the population of the primary school age group.

more disadvantaged relative to boys in poor homes. The boys from rich households had enrollment rates 34 percentage points higher than those of boys from poor households; the gap in favor of rich girls compared with poor girls was 55.4 percentage points. Wealth gaps in enrollment greatly exceeded gender gaps in enrollment.

Spending on primary education varies widely among developing countries, ranging from \$46 per student per year in South Asia and \$68 in sub-Saharan Africa to \$878 in Eastern Europe and Central Asia (see Table 2). Spending per student in secondary education shows a similar disparity, ranging from \$117 per student per year in South Asia and \$257 in sub-Saharan Africa to \$577 in Latin America and the Caribbean.

More money for education usually results in better education, but exceptions to this pattern are informative. A 2001 study of Latin American primary education showed that Cuba led in test scores, completion rates, and literacy levels. The lowest fourth of Cuban students performed above the regional average in third and fourth grade mathematics and language achievement, although most nations of the hemisphere spent more public money per student than the less than \$1,000 spent in Cuba (Marquis, 2001). This example suggests that policymakers, who are acutely aware of the competing demands on resources, might do well to investigate how some countries have achieved so much with only modest funds.

Financial obstacles

What would it cost to achieve both universal primary and secondary education? At best, crude estimates are available, but the combined total falls between \$34 billion and \$69 billion per year (see Box 1). This is a huge amount of money, but certainly not beyond the ability of the world to fund. If investments in education promote economic growth in the poorer countries as anticipated, the share of income devoted to primary and secondary education should decline.

How much could countries afford to spend? The World Bank estimates that the low-income countries, with a population of about 2.4 billion, had a combined gross national income (GNI) of almost \$1 trillion in 2000 (with an average annual per capita income of \$410). The incremental cost of

\$34 billion–\$69 billion per year would be 3–7 percent of their GNI, assuming they shouldered the entire incremental burden without any external help. The low- and middle-income countries, with a population of nearly 5.1 billion, had a combined GNI of nearly \$6 trillion (with an average annual per capita income of \$1,160). The incremental cost for them would be about 0.6–1.2 percent of their GNI.

Of course, if the richer countries shared the cost, the burden on the poorer countries would be less. The GNI of the high-income countries was \$25.5 trillion—out of the entire world's \$31.5 trillion—so an extra \$70 billion per year would be less than 0.3 percent of their income. Official development assistance (ODA) in 2003 was \$69 billion, the highest ever in

Box 1

Putting a price tag on education for all

Assuming education will be delivered largely through schools, educating all children will require additional money for schools, teachers, teacher training, materials and equipment, administration, assessments, randomized evaluations, and overcoming economic disincentives to families.

To achieve universal *primary* education (UPE) by 2015, the World Bank, UNICEF, and UNESCO have estimated the annual costs at between \$9.1 billion and \$35 billion per year, although a recent detailed Bank study suggests that the price tag might be as low as \$6.5 billion per year. These investigations focus on the cost of increasing the number of places for students in schools. However, the number of places available is often not the limiting factor. Future cost estimates should reckon the cost of providing other improvements necessary to encourage students to attend school—such as meals, tuition subsidies to families, improvements in the quality and reliability of teaching, and reductions in rates of repetition and non-completion. In other words, the true cost of UPE will include the cost of implementing policies to boost the demand for primary education, and current estimates overlook this cost.

To achieve universal *secondary* education, the cost will be greater than that for UPE because more children in this age bracket are not in school and secondary education is more expensive per pupil. If a gradual approach is taken between now and 2015, the annual additional cost would likely be between \$27 billion and \$34 billion. If an instantaneous expansion of secondary education is sought, a recent pioneering study suggests that the cost would be \$28 billion to \$62 billion annually, at least under current policies (Binder, 2005). But this cost could fall to \$47 billion if policymakers adopted the practices of countries most successful in making schooling available to students, getting students to attend school, and helping them learn while they are in school. The best (albeit unlikely) scenario, including a sharp drop in repetition rates, would reduce the extra annual cost to \$28 billion. The biggest expansion of secondary education will be needed in the poorest countries, where the average per-student yearly cost is \$126, compared with \$244 in low-income countries and \$884 in upper-middle-income ones.

Table 2

Big disparities

Current expenditures on primary education vary widely.

Region	Public spending per student (dollars)	Total public spending (million dollars)	Percentage of population with public spending data ¹
South Asia	46	6,900	98
Sub-Saharan Africa	68	6,100	98
East Asia and Pacific	103	21,200	96
Latin America and the Caribbean	440	28,200	90
Middle East and North Africa	519	14,200	60
Eastern Europe and Central Asia	878	5,200	22
Developing world	151²	81,800	88²

Source: Glewwe and Zhao, 2005.

¹Public spending figures are more reliable in regions where public spending data are available for a higher fraction of the population.

²Averages weighted by number of pupils.

nominal and real terms. However, this amount was only 0.25 percent of donors' combined GNI. Moreover, it was well short of the average of 0.33 percent of ODA/GNI achieved in 1980–92 and of the United Nations' ODA target of 0.7 percent. Thus, the incremental cost of \$34 billion–\$69 billion per year could consume up to the entire pie of recent ODA.

As public funds are limited, it is natural to ask: Is education the best use of the marginal dollar of government expenditure in a developing country? Should that dollar be spent on education rather than health, physical infrastructure, or applied research? Unfortunately, we know no convincing answers to these questions, even if the “best use” is interpreted narrowly as economically most efficient. Credible models to evaluate the trade-offs for human well-being between education and other sectors of public investment appear to be lacking. The same fundamental lack of knowledge applies to the trade-offs between primary and secondary or higher education. However, the difficulty of achieving universal education is about a lot more than money.

Nonfinancial obstacles

What are the nonfinancial obstacles to achieving universal primary and secondary education? Studies show that they are economic, competitive, informational, political, cultural, and historical.

Economic disincentives. Millions of children have access to schooling but do not attend. One explanation is that their families value more the time these children spend in other activities, such as performing work for income or handling chores so other household members are free to work in market activities. A troubled household economic situation is more often a deterrent to enrollment than lack of access to a school. For example, a World Bank study in Ghana found that almost half of parents, when asked why their children were not in school, answered “school is too expensive” or “child needed to work at home.” Another 22 percent believed that education was of too little value. Lower market wages for women can make investing in schooling for boys before schooling for girls a rational economic decision for a family.

Competing demands. Education competes for scarce national resources with many worthy projects, such as building roads, providing medical care, and strengthening national defense. Limited resources can hamper educational expansion in many ways. Organized interest groups may divert funding from education to their own causes. When social crises, such as crime, unemployment, or civil war, demand the time and resources of the government, citizens may support channeling resources to remedy these crises rather than to education. A limited capacity to oversee the implementation of education programs and the limited status of education ministries within many governments may also pose problems. Competing demands from business and other employers may limit the supply of people qualified to be primary and secondary teachers.

Lack of information. Reliable, internationally comparable, useful data on many aspects of primary and secondary education are lacking. For example, the mechanisms that keep

children out of school are poorly understood in quantitative (as opposed to qualitative) detail. Most routine data focus on measures of “butts-in-seats” (in the expressive language of World Bank economist Lant Pritchett), such as enrollment, attendance, and completion. Political incentives sometimes work against accurate reporting. In Uganda, enrollment was historically underreported because schools were required to remit private tuition receipts to the government in proportion to the number of students they reported. When schools became publicly funded on the basis of enrolled pupils, the incentive for schools to report higher numbers resulted in a leap in official enrollments. Governments may also be reluctant to publish potentially unflattering data on their school systems for fear of political consequences.

Political obstacles. Politics may stymie educational expansion for other reasons. The long time horizon over which educational returns accrue greatly exceeds the short time horizon of political incumbents. When politicians devote funds to education, the funding sometimes flows to political supporters rather than to programs and regions where it is most needed.

Cultural barriers. Discrimination may inhibit educational participation, particularly for girls and for linguistic, religious, and ethnic minorities. Verbal and physical abuse; a lack of functional, secure toilets for girls; and long distances between home and school can deter parents from sending daughters to school. Where girls are expected to care for family members and to perform household chores, education may be seen as unnecessary. Girls' education may also be seen as a low priority if they leave their parents' household upon marriage.

Historical context. Past national models and motivations for education have been diverse. Solutions that ignore the history of education in a particular country are likely to be less effective than solutions tuned to context. Attempts to decentralize education in Latin American countries in the 1980s ignored the social and political purpose of using schooling to end severe socioeconomic segregation. Decentralization led to a growth of private schools and renewed fragmentation along socioeconomic lines, which exacerbated the social divide that school centralization was intended to correct.

Judging quality and effectiveness

Inadequate information about the quality of education complicates matters. Without it, quality is unlikely to improve, which, in turn, undercuts efforts to mobilize the money and motivation to achieve high-quality primary and secondary education. International assessments, which are largely based on OECD models, can be very useful but may not be optimal for all countries. For some countries, national assessments focused on country-specific curricula or regional approaches provide more relevant information—given that every assessment implies stated or unstated goals of education, and these goals are highly diverse.

Using educational assessments. When properly carried out, assessments allow individuals and communities to track the quality of schools and systems. If policymakers make information on educational quality in specific schools and

curricula available to the public, then students and parents may be better able to choose among educational options and demand education of higher quality. The Southern African Consortium for Monitoring Education Quality is a regional learning assessment study introduced by UNESCO and now governed by the 14 southern African participating governments. It aims to identify within-country disparities in education as a guide to where interventions might be needed.

Developing reliable and useful assessments requires institutional capacity, technical expertise, and money—all likely to be scarce in developing countries. Moreover, when assessments are tied to funding decisions, teachers, administrators, and state officials may oppose creating or releasing such data. Encouraging developing countries to participate in international assessments as “associates” (so that results need not be released internationally) will promote the generation of much-needed data, give access to expertise, and build local capacity to develop, administer, and analyze tests, while avoiding the political consequences of possible poor performance by participating countries.

Using randomized experiments. Many traditional practices in education have never been evaluated by scientific experimentation to measure quantitatively what they contribute to educational outcomes. Would students learn arithmetic or history less effectively if they were not required to be in their seats by the time the school bell rang? Few innovations in education have been rigorously compared with traditional practices. Does a student who learns touch typing from a computer learn any better, or at a significantly lower cost, than a student who learns from a traditional teacher or by self-instruction from a printed book?

A reliable means of getting answers to questions like these—namely, randomized controlled experimentation, the gold standard for evaluating treatments in medicine—is now finding use in education. Such experiments make possible valid comparisons among pedagogical techniques and systems of management because randomization establishes equivalent participant and nonparticipant groups for comparison. These experiments can, therefore, produce the most credible assessment of programs, including their cost-effectiveness (see Box 2).

Randomized evaluations are most powerful when applied narrowly to test isolated variations. Without a theory of why the program has the effect it has, generalizing from one well-executed randomized evaluation may be unwarranted. Similar questions about wider application arise no matter what evaluation technique is used. Given positive results from any evaluation of a key innovation, one useful step would be to encourage adapted replications of randomized evaluations in several different settings.

Unfortunately, randomized evaluations remain underutilized guides. Many people assume the reason for this is that these experiments are expensive and time consuming, and require technical sophistication to plan, implement, and analyze properly. But, in fact, they are no more expensive or time consuming than other rigorous data collection. More likely, they are underused because it can be politically difficult to

deliver a program to only a sample of students or schools while withholding it from a comparison group. However, when budgetary constraints make it difficult or impossible to reach all members of a population in a given year, randomly selecting which groups receive the program in year one, year two, and so on, may be the fairest way to implement the program and simultaneously permit measurements of its impact. Using randomized phase-ins addresses the trade-off between evaluating and scaling up programs.

Defining the goals. Assessments and evaluations presume goals for what education should accomplish. Who should decide educational goals? What relative weight should be given to the voices of parents, children, politicians, clerics, educational experts, leaders of business, labor and the community, and others? How should the weight attached to the views of different claimants for influence be decided? These questions need more public discussion and policy attention than they currently receive, and thus should be encouraged by governments and international organizations.

Proposed educational goals include reading, writing, and arithmetic; readiness for the local or global labor market; health knowledge and healthy behavior; the creation (or sustaining) of a more cohesive society; the capacity to adapt to ceaseless change and to learn under conditions of freedom; assisting youths to fulfill their physical, emotional, social, spir-

Box 2

Can deworming boost attendance?

For policymakers trying to figure out which educational programs are cost effective and which ones are not, there is growing evidence that randomized evaluations—long used in the medical field—provide valuable insights. Indeed, a recent study by Harvard University’s Michael Kremer reports that randomized evaluations of school-based health programs in Kenya for deworming and India for anemia show that simple and inexpensive health treatments can dramatically boost attendance (Kremer, 2004).

In western Kenya, the researchers evaluated a twice-yearly primary school deworming program that was phased in over several years. The researchers randomized the order in which schools were phased in to ensure statistically reliable comparisons between the schools with and those without the deworming program. They found that child health and school participation improved not only for treated students but also for untreated students at treatment schools and untreated students at nearby nontreatment schools due to reduced disease transmission. The direct effect of the deworming program, including within-school health spillovers, resulted in a 7.5 percent average gain in primary school participation in treatment schools and a reduction in absenteeism of at least 25 percent. When cross-school externalities were included, they found that deworming also resulted in a 2 percent average gain for pupils in nontreatment schools. They estimated that the cost per extra year of school participation was only \$3.50, making deworming an extremely cost-effective way of boosting attendance.

itual, and intellectual potential; providing the competencies children need for their lives and livelihoods; enabling students to interact in socially heterogeneous groups, act autonomously, and use tools; learning to know, to do, to live with others, and to be (Delors, 1998); addressing the needs of the world's poorest children and youth, those the global economy has left behind; promoting tolerance rather than hatred; and opening people's minds rather than controlling them.

Five changes needed

Universal, high-quality primary and secondary education is achievable by the middle of the 21st century. But at the current rate of progress, by 2015 roughly 118 million children of primary school age will still not be enrolled in primary education and 217 million of secondary school age will still not get a secondary education (16 percent and 30 percent of the relevant populations, respectively), according to our estimates. What is needed now? No single magic bullet will bring high-quality primary and secondary education to all the world's children. Rather, at least five complementary, interacting changes are needed:

- open discussions, nationally, regionally, and internationally, on what people want primary and secondary education to achieve—that is, the goals of education;
- a commitment to improving the effectiveness and economic efficiency of education in achieving those goals, whether through formal schooling or other means; this improvement should be driven by reliable data on what children learn; careful experiments with alternative pedagogical techniques and technologies; and comparative studies of the countries that perform best, region by region, within any given level of funding and material resources;

- a commitment to extending a full cycle of high-quality secondary education to all children;
- international recognition of the diverse character of educational systems in different countries, and adaptation of aid policies and educational assessment requirements to local contexts; and
- more money and higher priority for education—especially an increase in the absolute and relative amount of funding from rich countries for education in poor countries.

The goal of providing high-quality primary and secondary education to all the world's children is as inspiring and formidable a challenge as any extraterrestrial adventure—and far more likely to enrich and improve life on earth, even in ways that may be difficult to anticipate today. ■

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References:

Binder, Melissa, 2005, "The Cost of Providing Universal Secondary Education in Developing Countries," *American Academy of Arts and Sciences Working Paper* (Cambridge, Massachusetts: American Academy of Arts and Sciences).

Bloom, David E., and Joel E. Cohen, 2002, "Education for All: An Unfinished Revolution," *Dædalus (Summer)* (Cambridge, Massachusetts: MIT Press), pp. 84–95.

Cohen, Joel E., 1995, *How Many People Can the Earth Support?* (New York: W. W. Norton).

Delors, Jacques, and others, 1998, "Learning: The Treasure Within: Report to UNESCO of the International Commission on Education for the Twenty-first Century," 2nd Pocket edition (Paris: UNESCO Publishing).

Filmer, D., 2000, "The Structure of Social Disparities in Education: Gender and Wealth," prepared as background paper for *Engendering Development Through Gender Equality in Rights, Resources, and Voice* (Washington: World Bank).

Glewwe, Paul, and Meng Zhao, 2005, "Attaining Universal Primary Completion by 2015: How Much Will It Cost?" *American Academy of Arts and Sciences Working Paper* (Cambridge, Massachusetts: American Academy of Arts and Sciences).

Kremer, Michael, 2004, "The Role of Randomized Evaluations in Making Progress Towards Universal Basic and Secondary Education," *American Academy of Arts and Sciences Working Paper* (Cambridge, Massachusetts: American Academy of Arts and Sciences).

Marquis, Christopher, 2001, "Cuba Leads Latin America in Primary Education, Study Finds," *New York Times*, December 13, 2001.

United Nations Educational, Scientific, and Cultural Organization, 2000, "Education for All 2000 Assessment: Statistical Document," prepared for the International Consultative Forum on Education for All. *World Education Forum, Dakar, Senegal, April 26–28, 2000.* Available at <http://unesdoc.unesco.org/images/0012/001204/120472e.pdf>.

———, 2004, *Global Education Digest 2004: Comparing Education Statistics Across the World* (Montreal: UNESCO Institute for Statistics).

Williams, James H., 1997, "The Diffusion of the Modern School," in *William K. Cummings and Noel F. McGinn, International Handbook of Education and Development: Preparing Schools, Students and Nations for the Twenty-First Century* (Oxford: Pergamon, Elsevier Science).

World Bank, 2002, *Education and HIV/AIDS: A Window of Hope* (Washington: World Bank).