

**Improving Educational Quality (IEQ) Project**

**DISTANCE EDUCATION:  
AN OPTION FOR INCREASING ACCESS AND  
IMPROVING QUALITY IN SECONDARY EDUCATION**

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## INTRODUCTION

As the number of children completing primary school grows, pressure is building for a more far-reaching expansion of secondary schooling. Over the past 40 years, the world has experienced a considerable expansion in access to schooling: while in 1960 less than half of primary school-age children were enrolled in school, by the early 1990s the proportion was above 75 percent. During the same period, the enrollment rate for 12 to 17-year olds more than doubled, from 21 to 47 percent (World Bank, Education, 1999). Yet secondary education has not featured strongly in the educational agendas of developing countries. It has suffered from a sort of identity crisis, belonging to a nebulous zone where students are at once expected to broaden the academic skills learned in primary, as well as to prepare for the world of work or higher education (UNESCO, 2001). This double function adds a level of complexity to the expansion of secondary schooling that many countries have been disinclined to tackle.

Currently, this position is beginning to change, particularly in those countries where near-universal primary school enrollment is creating pressure at higher levels. In El Salvador, for instance, primary school enrollments now stand at almost 90 percent, while those for secondary education stand only at 34 percent. El Salvador, as other countries with high primary enrollment rates, now sees secondary school expansion as the next hurdle in its path towards development (Winter, 1999). Latin America as a whole has committed itself to increasing access to quality secondary schooling to at least 75 percent of its children by 2010. Furthermore, many national governments have taken on the challenge of making lower secondary schooling compulsory. In 1994, Indonesia expanded its definition of basic education to include nine years of primary and junior secondary school, and declared the ambitious target that all children aged 7 to 15 years receive basic education by 2004 (in 1996, primary school enrollment stood at 95% and junior secondary school enrollment at 58%) (Yeom, 2001).

For their part, multilateral banks and bilateral donors in the past have de-emphasized the need to improve secondary education in their efforts to prioritize the expansion of primary education. Again, the trend is shifting. The Inter-American Development bank is now directing more loans towards the reform and expansion of secondary education. Similarly, the World Bank is transforming its lending strategy from one heavily weighted in favor of primary education to one that manages education comprehensively, recognizing that the success of each educational level depends on the relative strength of the others. The Bank now works in all areas of education, depending on the priorities of each country (World Bank, Education, 1999).

## **SOURCES OF PRESSURE FOR EXPANSION OF SECONDARY EDUCATION**

### **SOCIAL DEMAND**

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Naturally, as primary enrollments rise, many of the new primary school graduates aspire to continue their education. In Brazil alone, secondary school enrollments are growing by over half a million entrants each year. Studies in that country show that the most important determinant in the number of years of schooling attained by children, even after controlling for family income, is the educational level of their parents, so that demand for secondary schooling will grow exponentially as the educational levels of the general population rises (World Bank & IDB, 2000).

In the eyes of many communities, secondary schooling is a symbol of social advancement. Participatory studies consistently show that the poor regard education as a mechanism for escaping poverty and for halting the transmission of poverty across generations (Watkins, 2000). Parents desire to raise the educational attainment of their children, whether or not higher-education or labor-market opportunities truly exist for them in the long run. Indeed, in developing countries where the supply of graduates remains relatively scarce, the private rate of return on secondary schooling, considering both additional earnings and the additional cost of schooling (cash, as well as opportunity costs), can be close to 20 percent (Fuller & Holsinger, 1993). The social demand for secondary education is apparent even in countries that are far from achieving universal primary enrollment. Communities in Kenya, for example, view education as a gateway for high social status and well-paying jobs, raising the demand for secondary schooling even when many of their children do not yet have access to adequate primary schooling (Kivuva, 2001).

### **NATIONAL NEEDS**

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#### **ECONOMIC DEVELOPMENT**

Not only is demand for the expansion of secondary education strong among students and their families, but developing countries, along with the international development community, are also realizing that current global economic changes necessitate higher levels of educational attainment. The two major changes underway that underscore this need are the expansion of market-based economies and globalization.

Today, more than 80 percent of the world's population lives under a market economy, up from under 30 percent a decade ago. Other economic systems, particularly centrally-planned systems, provided individuals with few opportunities, but with a high level of economic security. Market systems, on the other hand, tend to reward enterprise, innovation, and risk-taking, but offer little security for those unequipped to take advantage of market opportunities. Increasing the educational attainment of

individuals is crucial if developing countries are to compete successfully in the faster pace of market economies (World Bank, Education, 1999).

Globalization, referring to the increasing volume of global trade and finance, is also changing the educational requirements of nations. Global companies constantly seek better opportunities, including well-trained and productive labor forces, in market-friendly environments. Companies in developing countries are increasingly exposed to foreign competition, requiring them to make decisions and accommodate change more rapidly, elaborate faster processes and produce higher quality outputs at lower costs. Such exposure to global competition tends to increase the skill requirements of a country's workforce, a phenomenon frequently cited in studies of South Korea's economic growth (Alvarez, 2001).<sup>1</sup>

What, then, are the changes in the world economy that are creating such a need for higher educational attainment? References to the "new economy" abound, linking it somewhat hazily to the appearance of the Internet, a tool often credited with the great expansion in the availability of information. Indeed, this expansion makes the present era of technological change truly revolutionary in that human behavior and attitudes are substantially transformed with greater access to information, promoting greater creativity and innovation (ILO, 2001). Yet well before the rise of the Internet the world anticipated the advent of a "post-industrial society" in which the importance of physical inputs would be obscured by the importance of knowledge as a factor of production and a source of competitive advantage. Indeed, "knowledge capital" has long been a key factor for economic prosperity.

What makes the "new economy" new is the intersection of the older and more established knowledge economy of the "information revolution" with the more recent networking economy of the "communications revolution", where the latter has allowed quicker and greater access to the ideas provided by the former. The technological changes associated with the communications revolution have spread at an astonishing speed. For example, while it took 38 years before 50 million people listened to radio, within four years the same number of people was navigating the Internet (ILO, 2001).

In the "new economy", the generation and processing of knowledge and information in innovative ways increasingly determines productivity and competitiveness (Watkins, 2000). In fact, the "knowledge worker" of today's economy is one whose job it is to generate ideas (ILO, 2001). In 1991, the United States Labor Department produced the SCANS (Secretary's Commission on Achieving Necessary Skills) Report which, based on interviews with employers in all sectors of the economy, outlined the basic skills that workers need to succeed in the modern workplace. The five required competencies identified in the report are: 1) the ability to allocate resources (time, money, materials);

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<sup>1</sup> Draft: Not for citation or distribution.

2) the possession of interpersonal skills for effective teamwork and leadership; 3) the ability to acquire, analyze and use information; 4) the understanding of how social, organizational, and technological systems work; and finally, 5) the ability to use technology appropriately. The report also identified eight fundamental skills and qualities with which all workers should be equipped: Reading, writing, arithmetic, mathematics, listening, speaking, thinking skills (creative thinking, reasoning, decision making), and personal qualities (responsibility, self-esteem, integrity) (U.S. Department of Labor, 1991).

Although in most developing countries few of the characteristics of the “new economy” are present outside of capital cities, the forces of globalization are such that these countries cannot afford to ignore the changes transforming the world economy. While the changes in the nature of work may take longer to come about in these countries, the changes are inevitable. Some developing countries already face a dual challenge, with parts of their economies solidly entrenched in the “new economy” while others remain deeply traditional in terms of work practices and technologies.

Information is critical for development; in this sense, developing countries stand to gain from the expanding access to information that the “new economy” provides. Certainly, econometric evidence shows a strong correlation between the quality of a nation’s telecommunications infrastructure and its level of economic growth (ILO, 2001). But the access provided by improved infrastructure is not enough. In order to benefit from networked knowledge, countries will depend on the skills of their workers. The familiar truism that education and growth go hand in hand has never before been so apparent. Where in the past the comparative advantage of countries rested on their stock of capital and natural resources, in the future, national prosperity will depend increasingly on education as the only medium for imparting the types of skills and qualities identified in the SCANS report. Although the precise causal links between education and productivity are difficult to establish, an enhanced capacity to innovate seems to be of utmost importance (Watkins, 2000).

Failing to raise the educational attainment of their populations will not only cost developing countries in terms of foregone growth, it will also widen the gap between them and developed countries, making it more difficult for them to catch up. Indeed, the current changes are already causing the gap between rich and poor to grow within countries, with the minority of wealthy and well-educated individuals poised to take advantage of the new technologies and opportunities, while the majority becomes increasingly marginalized. The new economy demands people who are able to harness the wealth of available information in order to create innovative solutions. At the same time, demand declines for people with outdated skills and competencies (ILO, 2001). Evidence shows that technological progress has increased the wages of skilled, educated workers relative to those of unskilled workers. Apparently, “the income distribution patterns of tomorrow will increasingly reflect the distribution of educational opportunity” (Watkins, 2000). Those countries that prepare themselves to compete in the “new economy” by educating their workers will be most suited to benefit from the opportunities it affords.

The development community is progressively coming to the conclusion that in order to participate effectively in the “new economy”, developing countries must relinquish their singular focus on primary education and address educational development holistically. Current economic changes are causing the average number of years of schooling required for the workforce to grow. The new information-based economy requires a workforce with a range of skills and abilities that cannot be imparted adequately through primary education alone. Secondary school is the appropriate setting for acquiring these new skills because students have already acquired basic skills and knowledge in primary school. Secondary school also coincides with the age at which young people make critical career decisions and are ready to learn skills more directly relevant to their future employment.

Not only is secondary education required in the context of the “new economy”, but it also seems to be a prerequisite for faster economic growth in general. A World Bank study found that secondary enrollments in developing countries have been positively related to GDP levels over the past three decades (Fuller & Holsinger, 1993). The International Commission on Education for the Twenty-first Century states that “It is now generally recognized that, for economic growth to take place, a high proportion of the population has to have received secondary education” (UNESCO, 2001). Similarly, participants at the World Education Forum argued that “no country can be expected to develop into a model open economy without having a certain proportion of its work force completing secondary education” (UNESCO, 2001). The World Education Forum has gone so far as to include secondary school enrollment as a component of the Global Competitiveness Index. International comparisons show that exclusive emphasis on primary schooling may result in a labor force that is educationally behind the anticipated level of industrial development (Alvarez, 2001). As globalization acts to integrate developing countries into the “new economy”, differences in post-primary educational opportunities will increasingly distort the benefits of economic growth in favor of rich countries: “Without a sustained improvement in coverage and quality of secondary education, developing countries will fall further behind relative to developed countries” (Watkins, 2000).

#### STRENGTHENING DEMOCRACY AND SOCIAL COHESION

Besides the economic advantages of expanding secondary education, many countries are also realizing the social benefits of doing so. Over 100 countries, twice as many as a decade ago, now have democratically elected governments. For these new democracies to survive, their citizens must be educated so that they are able to understand difficult issues, make informed decisions, and hold officials accountable for their actions (World Bank, Education, 1999). Statistical evidence attests to the marked impact of education on democracy and civil liberties (USAID, 2000). The expansion of educational opportunities increases the voice of the poor, particularly at the local level, where they gain the self-confidence needed to engage in dialogue and influence decisions. Education raises young people’s awareness of their civil rights and responsibilities, and inculcate in them a sense of national loyalty.

A general secondary education can develop in young people attitudes, such as civic sense and tolerance, that contribute to the proper functioning of society (UNESCO, 2001). Increasingly, secondary education is taking on new roles in terms of inculcating values of citizenship and democratic participation in young people (Wolff & de Moura Castro, 2000). Governments and families are beginning to see in secondary education a unique opportunity to advance the socialization of their children.

In many developing countries, the number of unemployed and out-of-school youth is on the rise. The social marginalization of these youths causes them to become disillusioned with their future prospects, a process that threatens social cohesion and stability as young people turn to lives of crime and dereliction. Extending access to education for these youths can provide them with alternatives that will help curb urban drift and violence (World Bank, Education, 1999). It can also help to protect them from hazardous and exploitative labor.

Reaching this age group through education is vital to the success of interventions in areas such as HIV/AIDS and reproductive health education. Evidence on the social effects of secondary education suggests that it increases the labor market participation of young women and supports positive maternal practices. It also reduces fertility rates by increasing girls' time in school and by delaying the age of marriage (Fuller & Holsinger, 1993). Secondary education also inculcates in young people social values such as environmental awareness, cooperation, and cultural norms.

## **PRIORITIZING PRIMARY VS. SECONDARY EDUCATION**

Many countries remain far from the goal of achieving universal primary education as committed to at the World Conference on Education for All in 1990. In South Asia, 40% of children drop out before completing primary school; in Africa, over 30% do so. Furthermore, high enrollment rates do not guarantee high completion rates: Latin America has near universal enrollment, but one out of four children drops out before completing primary school (Watkins, 2000). Clearly when faced with such glaring deficiencies in primary education, an important policy question that countries face revolves around the appropriate time to expand access to secondary education. The dilemma consists in whether to resolve the problems of access and quality in primary education before placing secondary education on the agenda or to pursue both goals simultaneously.

If considering the question from an economic perspective, countries value the fact that primary schooling offers the highest social returns to investments in education. Nevertheless, country studies reveal numerous cases in which the returns to secondary schooling have exceeded those to primary. Yet this phenomenon might be due to diminishing returns: as the share of the population with primary education grows, the payoff to completing primary school tends to fall (USAID, 2000). Policy makers should be wary of depending too strictly on rates of return since these can be artificially

depressed (as when discrimination leads to lower wages for women) or inflated (as when politically-motivated interventions increase the wages of civil servants) by the labor market, making it difficult to determine the actual link between education and productivity (Watkins, 2000).

Despite the lower returns traditionally ascribed to secondary schooling, it is a sound investment for students who complete primary school. The access and quality of secondary schooling are critical for several reasons. First, primary education alone does not provide the skills necessary for the adoption of new production methods and technologies necessary to compete in a global economy, and evidence suggests that secondary schooling is positively associated with the production of high value-added export goods. Second, studies have shown that limited opportunities for secondary education may have the effect of reducing demand for primary education and encouraging dropouts, hindering the goal of universal primary education that many countries have set. Finally, as many countries are already beginning to witness, the progress towards universal primary school education will inevitably increase demand for secondary education, a demand that most systems at present are unable to satisfy (Watkins, 2000).

International development organizations are beginning to change their stance regarding secondary education. The World Bank's 1999 Education Sector Strategy calls on governments to ensure that their children are able to complete primary as well as lower-secondary schooling of adequate quality. It also states that "deferring the acquisition of advanced skills by part of the population until the foundation skills are universally acquired does not make sense if countries are to succeed amidst the global changes now taking place" (World Bank, Education, 1999). In keeping with this new policy, the share of the Bank's lending going to secondary education rose substantially in the 1990s.

USAID, for its part, encourages its country Missions to maintain their focus on primary education as long as access and quality at this level remain unsatisfactory. In countries where a substantial proportion of children fail to complete primary school, USAID Missions advise host governments to concentrate their financial support for education on the primary level. Nevertheless, USAID policy acknowledges that as countries approach universal completion of primary schooling and as its quality improves, a stronger case emerges for using public funds to subsidize lower-secondary, and eventually, upper-secondary schooling (USAID, 2000).

## **CHALLENGES IN THE EXPANSION OF SECONDARY EDUCATION**

### **MACRO-ECONOMIC ISSUES**

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The potential for secondary education to positively impact a nation's economic and social development must be qualified with the warning that this will only take place in an environment of

political and macro-economic stability. Where weak macro-economic policies depress productivity and inhibit the functioning of markets, an increase in the supply of skilled labor may not be matched by an increased demand for that labor. Zimbabwe offers an illustrative example. During the 1980s, the country invested a large proportion of its national income in education, achieving near-universal primary education in the space of a few years and greatly increasing secondary school enrollment. Yet macro-economic policies geared towards capital-intensive rather than labor-intensive growth undermined the benefits of that investment, creating only 30,000 formal-sector jobs for every 200,000 school-leavers (Watkins, 2000). In many other countries as well, secondary school students encounter a lack of employment opportunities upon graduation. Many are unemployed or underemployed, and many others emigrate in search of better opportunities. This “brain drain” poses a significant threat to the returns that poor countries expect from investment in secondary education.

#### ACCESS ISSUES

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Evidence shows that countries in which educational attainment within the labor force is more evenly distributed enjoy faster economic growth (USAID, 2000). Yet the distribution of educational opportunity not only has consequences for a nation’s economic growth, but also for the distribution of income of its population. For example, in South Korea, the proportion of workers with secondary and post-secondary qualifications grew rapidly after the early 1970s. Where, in the early 1970s, the average income of those with higher education was 97 percent greater than the national average, by the mid-1980s, the difference had fallen to 66 percent. In Brazil, by contrast, the earnings of those with higher education had reached 156 percent above the national average. One reason for the difference between the two countries is that Brazil failed to combine economic growth with equity in education. In the 1950s, Brazil had higher primary school completion rates than South Korea (60 percent vs. 36 percent), but by the mid-1980s, South Korea’s primary-completion rates were four times higher than Brazil’s (Watkins, 2000). As globalization increases the demand for skilled labor relative to unskilled labor, income inequalities will widen, slowing the rate of poverty reduction, since the poor will be unable to participate in the markets on equitable terms.

Considerable inequities exist throughout the developing world in access to secondary education, with students from poorer homes and those in rural areas often excluded from the system because they cannot access existing secondary schools. In Brazil, for example, almost 95 percent of enrollments in lower secondary and 99 percent of those in upper secondary are in urban areas, and very few of the poorest make it through secondary school (World Bank & IDB, 2000).

Since, in the past, academic secondary education has been reserved primarily for the children of the elite, it has been largely geared towards preparing students for university entrance examinations. As secondary education expands, an increasing number of students will come from poorer backgrounds.

Schools will have to rethink their objectives as a growing proportion of their students begin to terminate their academic careers upon graduation.

Furthermore, secondary schools have rarely taken into account the needs of working students, expecting them to either work or go to school, but not both. Educational planners will need to consider this factor, especially since the opportunity costs of education increase with a student's age so that secondary schooling is significantly more expensive than primary schooling for poor families. Countries that have offered night schooling have found it to be an important option for secondary school students: in Brazil 60% of upper-secondary students are enrolled in night classes, as most of them work full time (World Bank & IDB, 2000). Without the option of studying at night, many older and poorer students may opt to drop out of the system all together.

## QUALITY ISSUES

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Only investments in quality education have a positive impact on economic growth. Measured in terms of educational outcomes, the return to educational investment in many countries is abysmally low. Assessing educational quality is a challenging task, given that there are no internationally agreed-upon standards for measuring progress over time. Nevertheless, there is a broad consensus on what educational quality entails: motivated teachers, a curriculum appropriate to current needs, and good teaching materials and school environment (Watkins, 2000). According to these criteria, schools in many developing countries fail to meet minimum quality standards. Secondary school teachers lack pedagogical skills as well as adequate knowledge of the subject matters they teach. Learning materials are often scarce and of low quality. Curricula are not relevant either to the needs of the workforce or those of tertiary education. Schools rarely have a sense of mission or identity, and their directors lack authority and recognition.

Given the needs of the "new economy", secondary education must provide young people with the skills to process information in innovative ways. The aim of education must be to develop students' cognitive skills and equip them with the knowledge of how to learn and the desire to do so; in other words, education must prepare students for lifelong learning. Students must move from being passive recipients of information to being active participants in the process of learning, and teachers must move from being transmitters of information to being facilitators of the acquisition of knowledge (ILO, 2001). Even as knowledge of facts diminishes in relevance, the secondary school curricula of many developing countries are still heavily weighted towards learning by rote, instead of promoting understanding and application. Thus, a pressing problem is to render secondary school curricula more functional for today's needs (UNESCO, 2001).

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## COST ISSUES

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The lack of unit cost estimates by country makes thorough study of the costs of expanding secondary education problematic. Certainly the unit costs of expanding secondary education are considerably higher than those of primary education: for example, in the least developed countries, each secondary school student costs on average about 3.5 times more than each primary school student (Anzalone, 1995). Whereas all subjects in primary school can be taught by one teacher, secondary schools require teachers with specialized subject-area knowledge. Qualified secondary school teachers are more difficult to attract since they have more labor market options available to them. Thus, financial incentives for teachers must be substantially higher at the secondary than at the primary level. Presumably, lower secondary is less expensive than upper secondary since, like primary education, it is more general and requires less specialized teachers and classrooms; but there is little expenditure information that differentiates between the lower and upper secondary levels (Garfield, Holsinger & Ziderman, 1994).

The estimated costs of secondary expansion are greatest in sub-Saharan Africa, where countries would need to spend an average of 16.8% of 1990s GNP to raise the enrollment ratio to 100 percent. The main factors accounting for Africa's relatively high unit costs are: 1) inefficient use of teachers; 2) extensive use of expatriate teachers; 3) relatively high wages for teachers; 4) few economies of scale due to the small size of the secondary education system; and 5) relatively large numbers of boarders in the system (Garfield, Holsinger & Ziderman, 1994). The Inter-American Development Bank estimates that Latin America would need to invest over US\$10 billion in secondary school construction over the next ten years in order to meet the expected increase in secondary school enrollment from 55 to 75 percent. Given Latin America's recent and expected economic growth, the amount is not excessive if the political will existed to make it happen. In fact, the region should even be able to sustain major quality improvements if it maintained an average growth rate of 3.2 percent per year, as it did between 1990 and 1996 (IDB, 2000).

How will developing countries with limited budgets and competing priorities pay for the expansion of secondary schooling? Undoubtedly, the smaller the share of a country's population that completes primary school and progresses on to higher levels, the more regressive public spending at these higher levels becomes (Watkins, 2000). Unfortunately, many developing countries have historically spent large portions of their education budgets on tertiary education, a policy tantamount to public subsidies for the rich in countries where only members of the elite are able to attend universities.

One response to the issue of education budget allocations is found in the Oxfam Education Report, which suggests the following guidelines: 1) at least 6 percent of GDP should be dedicated to education; 2) in countries where a substantial proportion of the primary-school age population is out of school or where dropout rates are high, 60 percent of the education budget should be assigned to

primary education; and finally, 3) countries should place greater emphasis on lower secondary education in order to improve transition rates into secondary school (Watkins, 2000). Countries must be careful not to appropriate money currently devoted to primary education in their effort to expand secondary education. In the Philippines, for example, the share of primary education expenditure financed out of the government budget fell sharply over the 1990s, pushing up household costs. Meanwhile, public spending on higher-education increased, as did the share of secondary education in the national budget (Watkins, 2000).

A wiser strategy would reduce the share of spending going to higher education in order to expand secondary education. The shift certainly makes sense in terms of economic growth since social returns to secondary education exceed those to higher education. Given the regressive character of spending on tertiary education, countries that do not shift away from public funding of tertiary education also make considerable sacrifices in terms of equity. Correcting this misallocation of funds should be a key element in any educational reform (USAID, 2000). One way of doing this is to introduce cost recovery at higher levels of education. Yet because of strong political pressure from those that benefit from public spending on higher education, governments have typically been reluctant to take this step.

Country evidence confirms that the indirect and direct costs of education impose a heavy burden on poor households. Research also shows that opportunity costs for the household rise with the children's age, as their potential to generate income increases. For these reasons the issue of cost-sharing is subject to intense debate. For some, parental contributions and school fees constitute valuable devices for generating the resources needed to provide quality education. But opponents see cost sharing as an indirect tax on education, indeed a highly regressive tax since it absorbs a proportionately larger share of the income of the poor than of the non-poor. In El Salvador, for example, the costs borne by households for public secondary schooling amounts to 54 percent of the average monthly household income, posing a significant barrier for low-income families (Winter, 1999).

As a general guideline, countries should avoid cost-sharing at the primary and lower secondary levels, though it may have a role to play in upper secondary, and certainly in tertiary education, especially in countries with lower rates of primary enrollment and completion (Watkins, 2000). Some countries are trying innovative ways of targeting their subsidies for secondary education to the households that need it most: Colombia instituted a system of vouchers for children from poor households to attend private secondary schools (King, Orazem & Wohlgemuth, 1998); and Indonesia, where parents are responsible for fees and other educational expenses at all educational levels, is offering scholarships for needy students and has begun to provide block grants to the poorest 60 percent of schools (Yeom, 2001).

Another critical method to liberate funds for expanding secondary education is to improve the efficiency of the education system. High rates of repetition are a leading cause of inefficiency in the education systems of developing countries at both the primary and secondary levels. Repetition is

widely used as a classroom management tools; teachers often believe that their success is reflected in the number of students that fail to advance to the next level. But, by prolonging the school cycle, repetition increases the per capita costs of education, enlarges class sizes, and creates pedagogical problems associated with teaching over-age children. It also discourages children and increases costs for families, both important factors in the high dropout rates observed in most developing countries (Watkins, 2000). Studies in Brazil show that repetition, rather than lack of access, is the principal impediment to the expansion of secondary education (World Bank & IDB, 2000). Beside repetition, dropouts are also a source of inefficiency, since they add to the system's efforts to produce a graduate, consuming educational resources without achieving the objective of graduation.

## **DISTANCE LEARNING AS AN OPTION FOR SECONDARY EDUCATION**

An important alternative for addressing the challenges of cost, access and quality surrounding secondary education is distance education. Increasingly, countries are beginning to experiment with this option: for example, eleven of seventeen African countries responding to a 2000 World Bank survey reported using some sort of distance education technology in secondary education (World Bank, Pre-Final Draft).<sup>2</sup>

Distance education is a process in which a significant portion of the teaching is conducted by someone removed in space from the learner. It usually involves a combination of media through which students receive the course content as well as detailed instructions on the activities they should undertake while studying their lessons. The fact that distance education usually involves some sort of face-to-face contact between students and teachers or facilitators makes it difficult to draw sharp distinctions between distance and traditional education. Distance education actually refers to a wide spectrum of models that can be loosely classified according to the extent of face-to-face contact between students and facilitators. At one extreme is the so-called open-education model where students work independently with little or no contact with teachers or other tutors. At the other extreme, distance teaching can be a tool to supplement the work of teachers in traditional classrooms (Perraton, 1982).

## **COST OF DISTANCE EDUCATION**

Distance education is a financially attractive option primarily because it avoids many of the variable costs of conventional education. The proportion of variable to fixed costs tends to be higher in conventional than in distance education. Variable costs are those that depend directly on the number of students, including teachers' salaries, facilities, books and other materials. In conventional systems,

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<sup>2</sup> Draft: Not for citation or distribution.

total costs increase in proportion to the number of children being educated, so that average and marginal costs are roughly equal.

By replacing teachers with self-instructional materials, distance education can significantly reduce the amount of resources devoted to teachers' salaries, a category that consumes a high proportion of the educational budgets of developing countries. Even programs with face-to-face contact usually employ facilitators that require much lower compensation than conventional teachers. Another important cost-reducing factor is the high student-teacher ratios in most face-to-face distance education sessions: for example, in Malawi, the student-teacher ratio in traditional secondary schools is 25:1 while in the distance education study groups it is 55:1 (Murphy & Zhiri, 1992). Finally, distance education allows the system to save on the costs of building educational facilities.

Distance education programs require heavy investment in design, publishing, broadcasting, technological infrastructure, and preparation of teaching materials. These are fixed costs in that they are incurred regardless of the number of students enrolled in the system. But once the initial investment is in place, the relatively low variable costs of distance education mean that the cost of each additional student entering the system is very low; for example, if radios are widely available, it costs no more to broadcast to a million students than to a hundred. In fact, the greater the number of students enrolled in the program, the lower the average costs, since the fixed costs can be amortized over a larger population. To take advantage of these economies of scale, distance education programs should expand the number of students to the point where the marginal cost approaches average cost (World Bank, Pre-Final Draft).

## **DISTANCE EDUCATION MODELS: EXPANDING ACCESS AND IMPROVING QUALITY**

For decades, developing countries have established distance education programs in order to expand access to education, particularly for students in remote communities, and to improve the quality of conventional education. Distance education programs aimed at expanding access are broadly categorized in either the "open-learning" or "group-study" models. In the open-learning model, students spend most of their time studying independently, although they may have some contact sessions with teachers or facilitators in order to resolve problems they may have run into in their studies. In the group-study model, students work independently in the presence of other students, and have facilitators available to answer their questions.

The line between distance education systems meant to expand access and those meant to improve quality is not rigid. Two particular types of group-study systems, Interactive Radio Instruction (IRI) and instructional television, have been used by many countries as tools for both expanding access and improving educational quality. Those efforts primarily aimed at improving quality usually employ

some type of communications technology to organize educational activities that are facilitated by the classroom teacher. These programs are normally used to present subject matters in which teachers may lack expertise, as well as to counteract the poor quality of teaching pedagogy and materials.

## OPEN-LEARNING MODEL

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### INDIA

In 1989, the Government of India established the National Open School (NOS) in order to extend secondary education to students without access to the conventional system. The School awards certificates in grades 10 and 12, which are widely recognized by government and employers as well as by more than 70 Indian universities. The primary medium of learning in NOS is the self-instructional guide. Supplementary audio and video programs are available through study centers; these audio visual tools are meant to reinforce learning and are not an actual part of the program.

NOS also offers optional contact sessions with teachers on evenings and weekends in which students have a chance to address problems they were unable to resolve on their own. Unfortunately, the effectiveness of the personal contact classes has been limited; many students find it difficult to attend, particularly if they work. Furthermore, since tutors are conventional school teachers, they are unfamiliar with independent-learning methods and tend to resort to lecturing. Evaluations have found that up to 40 percent of students do not attend contact classes at all.

NOS has strong links with conventional secondary schools, which serve as study centers and provide support to students. It maintains strict standards of quality in curriculum and instructional materials, which are developed by committees of subject experts and educational planners. Nevertheless, despite NOS's efforts to maintain high standards of quality, many people still consider it a second-rate system.

To date, NOS has enrolled more than 260,000 students. The School has been particularly successful in reaching disadvantaged groups such as girls, members of scheduled castes and tribes (the former Untouchables), and handicapped persons: in 1993, more than 60 percent of NOS students belonged to these groups (38 percent women and girls, 25 percent scheduled castes, tribes, and handicapped persons). NOS enrolls a higher proportion of these disadvantaged students than the conventional school system: for example, in the formal system, only 26 percent of enrolled students are girls, compared to 38 percent in NOS. After enrolling, students have five years to complete their course of study, allowing them ample time to study at their own pace without having to give up other productive activities. In fact, more than 30 percent of NOS students work, underscoring the attraction of flexible distance education programs for low income families for whom these programs offer a way to reduce the opportunity costs of education. While NOS generates as much as 92 percent of its recurring costs through student fees, it offers special concessions to girls and people from disadvantaged groups to encourage their enrollment. (Anzalone, 1995).

## SOUTH KOREA

In 1974, in an effort to meet the growing demand for secondary schooling, South Korea established the Air Correspondence High School (ACHS), a distance education program leading to the same examinations taken by regular high school students. Student fees, rather than government funding, covered most of the program's costs. ACHS's methodology was based on textbooks for independent study, daily radio broadcasts, and face-to-face sessions. Each subject area had its own textbook, which was actually a version of the textbook used in conventional schools expanded to include additional explanations and self-assessment exercises. The textbooks were so reputable that they were actually in high demand from students in conventional high schools.

ACHS students were expected to dedicate four hours a day to their coursework, as well as to listen to the radio lessons broadcast six days a week. These lessons were only transmitted early in the morning and late at night, and they were not repeated. This awkward schedule made it very difficult for students to listen to the radio lessons, but unfortunately a shortage of air time prevented ACHS from offering more convenient broadcasts. Another shortcoming was the short length of the radio lessons. The fifteen minute broadcast usually meant that the lessons consisted of a high-speed talk by an academic teacher trying to pack as much information as possible into the allotted time. Because of the shortage of funds, no special effects or dramatizations could be introduced to enliven the programs. Nevertheless, the fact that students were required to submit notes on each program as a mandatory part of their grade meant that most students did in fact manage to listen to the lessons.

Every other Sunday, students attended face-to-face sessions conducted by regular high school teachers who were paid for the additional duty. The Sunday sessions were meant to reinforce those subjects deemed particularly difficult or that required practical work. In order to continue to the next grade, students were required to attend at least two-thirds of these sessions. Although the sessions constituted an important part of the program, their usefulness was hampered by the large student-teacher ratios (average 40:1), which made it difficult for students to receive individualized attention. Students coming from remote areas found it difficult to attend the face-to-face sessions regularly. Finally, due to the inconvenience of listening to the radio lessons, the Sunday teachers were often unaware of the subject matter that had been covered the previous week; as a result, they sometimes ended up repeating the same material or contradicting what had been taught on the radio.

ACHS was a highly successful and cost-effective program. In 1977, it had 9,960 enrolled students, 85 percent of which were between the ages of 15 and 23. Their academic achievement was about 12 percent lower than that of regular high school students, but this was not particularly disappointing given that many had been out of school for several years and came from lower socioeconomic backgrounds. The graduation rate per enrolled student was 46 percent and this rate was achieved at one-fifth of the costs per graduate of regular high schools. One important factor in the success of the program is that its curriculum was the same as that of regular high schools, so that the objectives of

ACHS were in line with those of the conventional school system. Furthermore, ACHS succeeded in maintaining rigorous academic standards. (Perraton, 1982).

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## GROUP-STUDY MODEL

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### MALAWI

The Malawi College of Distance Education (MCDE) was established in 1965. Its secondary education program is geared to students completing primary but unable to gain entrance into conventional secondary schools, as well as to adults who wish to continue their studies at the secondary level. In recent years, the demand for MCDE courses by primary school graduates has expanded dramatically (Anzalone, 1995).

Distance education for out-of-school youth first began in Malawi, as in other African nations, as an open-learning model. But MCDE administrators soon realized that individual home-study was not suitable for adolescents, who needed more face-to-face support (Dodds, 1994). As a result, MCDE switched to the group-study model. In this model, a community usually takes the initiative by requesting that MCDE set up a study center in its vicinity. Students register at their local study center, where they gather daily to work independently on their packets of printed correspondence material. MCDE provides supervisors for each center, as well as the materials used by the students. Most supervisors are certified primary school teachers with two years of teacher training. Supervisors perform administrative tasks, support students as they work on their self-instructional materials, and maintain discipline. They are not expected to teach since they lack adequate subject-matter expertise at the secondary level. In 1986, the average ratio of student to supervisor was 55:1 (Murphy & Zhiri, 1992).

MCDE has been successful in expanding access to secondary schooling to students who otherwise would be unable to continue their post-primary studies. In fact, since 1981, the number of secondary school students enrolled in MCDE has exceeded the number of students in regular secondary schools. The costs of MCDE are significantly below the costs of traditional schools: in 1988, MCDE cost about one-third as much per examination pass as regular secondary school. (Anzalone, 1995). The MCDE study center system appears to be able to retain students until their examinations with relatively low dropout rates (Murphy & Zhiri, 1992).

But in terms of quality, MCDE leaves much to be desired. Printed learning materials are of poor quality and in short supply, students do not have access to laboratories or workshops, and they have a limited choice of subject. Furthermore, students who are used to the rote methods used in primary schools lack the ability and motivation to direct their own studies. As a result, on average, MCDE students achieve only a 19 percent pass rate on the Junior Certificate examination, compared to 75 percent for students from regular secondary schools. Lower performance might be expected from

MCDE students given that they had already performed poorly enough on primary school leaving examinations as to be denied acceptance to secondary school (Murphy & Zhiri, 1992). Nevertheless, the pass rate is still disappointingly low. Understandably, parents consider MCDE a second-rate option for their children.

Comparing the achievement results of students from different study centers yields interesting results. Given that all students receive the same study materials, the test results of students from different study centers should be relatively similar. Yet data from 1983 to 1987 show that for the ten best-performing study centers, pass rates averaged 38 percent, while for the ten worst-performing centers, the average was 8.5 percent. Clearly the choice of center is a factor in how well the students perform. MCDE staff members seem to agree that the reason for the disparity is the quality of the study center supervisors (Murphy & Zhiri, 1992).

#### INDONESIA

In 1979, the Open Junior Secondary School (OJSS) was established in Indonesia to extend educational opportunities for secondary school-age children who were beyond the coverage of the regular education system. The main medium of study of the OJSS is the printed study guide, sometimes supported by audiovisual materials such as audiocassettes, radio programs, and TV or video programs. The government provides the study guides, teaching kits and other materials; in 1999, a government study proposed that students should also receive school uniforms and stationery in order to raise their motivation and improve the prestige of the OJSS.

The School follows a group-study model: students meet four to five days a week for at least three hours a day to study independently from specially-designed print modules, based on the same curriculum as that of regular schools. The study groups meet in regular school buildings, as well as in other community buildings such as mosque verandahs, village halls, and private houses. Facilitators supervise the students' learning activities at the centers. These facilitators include primary school teachers, university students, religious leaders, and health and agriculture extension workers. Each study center is associated with a regular secondary school, called the Base School, and each group is assigned a qualified subject-matter teacher from that school. Once or twice a week, OJSS students are required to attend face-to-face meetings with the Base School teacher. Students' performance is evaluated through midterm and final examinations for each course. Their final assessment is administered at the end of grade 9. Students who pass the examination are awarded the same certificate as students from conventional Junior Secondary Schools.

In 1999, there were 376,620 OJSS students in 3,773 locations throughout the country. The School has demonstrated positive results. For the period 1980-1998, 95 percent of OJSS students passed the national final examination. Nevertheless, evaluations of the program do reveal some obstacles. OJSS seems to have a difficult time recruiting enough writers capable of developing high-quality learning

materials. At the provincial level, there is also a shortage of personnel qualified to implement the distance education program. In some remote areas, there are also serious problems in the distribution of the learning materials so that sometimes these do not arrive on time or the numbers of copies arriving are not sufficient for all the students enrolled. OJSS has also found that students have difficulty becoming active and independent distance education learners. (Indonesian Ministry of Education and Culture, 1999).

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## INTERACTIVE RADIO INSTRUCTION

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Since the early 1970s, eighteen countries have developed Interactive Radio Instruction programs, covering diverse subject matters and targeting diverse audiences. The primary goal of IRI has been to improve educational quality, although many countries have taken advantage of the technology to expand access to education. IRI is typically used in a regular classroom, where the radio (or audiocassette) lessons are integrated as part of normal classroom activities. IRI programs are interactive in that they not only deliver audio lessons, but they also require students to perform specific group and individual activities during and after the radio program. These activities include answering questions, performing exercises, conducting short experiments, and other practical tasks. The 'audio teacher' also provides instructions for the classroom teacher, who facilitates the children's activities.

No technological intervention has proven its effectiveness more consistently than IRI. Evaluations typically show significant learning gains for children taught with IRI methodologies over children in conventional classrooms. In rural areas, IRI has served to reverse the common urban-rural gap in achievement and has proven particularly powerful in improving girls' performance in math, science and language. IRI has helped to expand educational access by bringing educational opportunities to children who would otherwise have been excluded from the system. Studies show that the programs have strong support from students as well as teachers (De Moura Castro, 1998). IRI students report being more motivated to come to school and their attendance is more consistent than that of students in conventional classrooms. Recent case studies also provide evidence that IRI contributes to the professional development of teachers, who appreciate the opportunity to learn new subjects in a way that does not embarrass them in front of their students (Dock & Helwig, 1999).

IRI's cost-effectiveness is remarkable. After initial development costs, which include planning, scriptwriting, radio production, and piloting programs, annual costs are typically as low as \$1.00 and \$1.50 per student, considering a student population of several hundred thousand (De Moura Castro, 1998).

### HONDURAS

Educatodos is a distance education program aimed at providing adolescents and young adults between 14 and 29 years old the opportunity to complete a high quality basic education (grades 1 through 9).

The average educational level of participants before entering the program is 1.9 years and their average income is US\$17.85 per month.

The program organizes students in community learning groups of about 10 to 20 people. Over 1,000 learning groups throughout the country meet in schools, churches, NGOs, and individual home. The group meeting times are flexible in order to accommodate the requirements of the students. Local volunteer facilitators, who have completed at least a primary education, are trained in methodologies for encouraging teamwork, guiding discussions, and creating supportive learning environments. The main media of learning are print materials and IRI (or audio cassette in areas without radio coverage or where students have difficulty meeting at the times of the broadcast).

Each level of *Educatodos* is equivalent to one grade of basic education. As students advance in the program, less and less of the teaching is conducted through IRI and the program becomes more heavily reliant on printed materials; this is meant to encourage students to take greater responsibility for their learning. Besides following the basic school curriculum, *Educatodos* also includes lessons on subjects that are directly applicable to the students lives, such as women's and children's rights, civic rights and responsibilities, and health and nutrition. The program attempts to limit the number of dropouts by suspending radio broadcasts at harvest time, disseminating motivational broadcasts, ensuring program continuity, and allowing participants to continue their studies when they change their place of residence.

A 1997 evaluation of the program showed that the average income of *Educatodos* participants had increased by US\$41 a year. This represents a private return on investment of 243 percent for participants and a social return of 145 percent for the Government of Honduras. The cost of the program is approximately US\$28 per person per year, compared to US\$100 in the traditional school system; the program aims to reduce its costs to US\$12 per person per year through efficiency gains.

*Educatodos* has also shown positive outcomes in learning. Where 68.6 percent of learners enrolled in grade 1 were illiterate at the outset, over 90 percent emerged literate from the program. The evaluation also noted significant social gains from the program. The percentage of parents who reported helping their children with schoolwork increased from 64 percent to 84 percent in *Educatodos* communities. Participants' engagement in community groups and associations and in local elections increased by 20 to 30 percent (Secretaría de Educación, 1998).

## INSTRUCTIONAL TELEVISION

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### MEXICO

Telesecundaria, initiated in 1968, is one of the most successful and sustained distance education efforts in the world (De Moura Castro, 1998). Telesecundaria allows schools in remote rural areas to deliver a

junior secondary curriculum (grades 7 through 9) identical to that of conventional schools. Unlike primary school where one teacher is in charge of all subjects, at the junior secondary level, each subject is taught by a specialist in the field. Most rural schools in Mexico do not have enough teachers to be able to assign more than one per grade. Telesecundaria allows schools to have one teacher per classroom while providing students with appropriate subject matter instruction through television programs and self-study materials.

Communities can request a Telesecundaria program by providing at least 15 students and a place for them to study. The national or state Ministries of Education provide the remaining resources, which include a teacher and television for each of the three grades, a digital signal decoder, a satellite dish, wiring, instructional materials and textbooks, and teacher training. Telesecundaria classrooms average 19 students per grade; students attend school 30 hours per week, 200 days per year, just as in the regular school system. Each lesson consists of a 15-minute television program, which introduces students to the subject matter. The television segments are lively and appealing, resembling network programming for children. This is followed by individual study in a specially-designed textbook, teacher-led discussion, group activities designed to apply the lesson to practical situations, and an assessment of student understanding. Lessons are broadcast twice a day, 8:00 a.m. to 2:00 p.m. and 2:00 p.m. to 8:00 p.m., to accommodate morning and afternoon school sessions. Telesecundaria follows the same curriculum as conventional lower secondary schools, but it also encourages students to play an active role in improving the quality of life of their communities by attempting to solve problems related to hygiene, pollution, water accessibility, and human rights. (Calderoni, 1998)

The program employs only certified teachers with university degrees, who receive one week of intensive training followed by day-to-day learning through televised programs and other in-service training activities (Calderoni, 1998). In addition to teachers, the Telesecundaria staff includes communications experts and specialists in the production of educational materials. Production time per 15-minute module is approximately 20 working days, with a cost ranging from US\$30,000 to \$50,000. While the per pupil costs of Telesecundaria and traditional secondary schools are similar, Telesecundaria appears to be a more cost-effective way of providing high quality education to remote rural areas (De Moura Castro, 1998).

In 1998, Telesecundaria served almost 800,000 students (grades 7 through 9) in 12,700 rural communities (Calderoni, 1998). Evaluations show that the program is as effective as conventional secondary schools. Telesecundaria students have higher promotion rates and lower dropout rates than conventional schools, and their results on achievement tests are comparable. Important aspects to which Telesecundaria's success are attributed include its full institutionalization within the Ministry of Education, its continued commitment to growth and quality, and the smooth coordination between community teachers and nationally-produced educational programs (De Moura Castro, 1998).

## BRAZIL

In the 1990s, Brazilian companies began to show an increased interest in improving basic education, sensing that the low educational levels of Brazilian workers was undermining the nation's economic productivity. It was in this context that in 1995, the Federation of Industries of Sao Paulo contracted with Globo Television Network to prepare a series of television courses for its workers. The industrialists contributed US\$30 million toward the production of the new program and Globo agreed to broadcast it without charge. In addition, Globo donated US\$60 million worth of commercial television time to promote the new program, Telecurso 2000. Telecurso is unique in that it is 100 percent privately funded and there is no involvement of the Brazilian Ministry of Education.

The program is geared primarily at young and adult workers who have not completed their basic education (De Moura Castro, 1998). It offers a condensed version of a basic curriculum, focusing on development of basic skills as well as job-oriented skills and attitudes. Most programs are produced in a work-place setting. The content for each subject matter is developed by professors from the major universities, who are required to have ample experience in the field of basic education. The primary media of course delivery are broadcast or videotaped classroom sessions and print materials. Students must pass a test for each discipline in order to accumulate credits leading to a graduation certificate that is recognized throughout Brazil. Tests are administered monthly for maximum flexibility.

More than 200,000 workers assemble each day in a classroom to watch Telecurso 2000. A teacher's aid is available to hold discussions, answer questions and provide general support to students. Classes are held in factories, labor unions, civic centers, penitentiaries, ships, and many other environments. Even though the program is geared towards young adult dropouts, regular schools are taking an interest. Studies show that more than 200,000 students in regular academic programs are using Telecurso materials and techniques. Initial evaluations show that Telecurso students perform much better than students in conventional schools (De Moura Castro, 2000).

## LESSONS LEARNED

Research indicates that distance education can be as effective as traditional face-to-face instruction in achieving positive learning results (Moore & Kearsley, 1996). Unfortunately, the quality of many distance education programs in developing countries is disappointingly low: students do not receive adequate support, curricula, methodology and materials are deficient, and programs are managed by unqualified staff and lack political commitment. These weaknesses typically result in high dropout rates and low levels of student achievement, making distance education a second-rate option in the public's perception. Following is a discussion of problems associated with in distance education as well as recommendations for avoiding them.

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## PROGRAM QUALITY

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### STUDENT SUPPORT

Distance education can be very effective with young adult and adult learners like those enrolled in *Educatodos* and *Telecurso 2000*. But self-instruction is an unreliable system of learning for children and adolescents. Young students do not have a clear understanding of their educational goals and, therefore, are poorly motivated to follow the disciplined path of self-study. Most students have little experience with self-study and do not realize that they must take responsibility for their own learning without first being prompted by an instructor (Moore & Kearsley, 1996). Because distance learning is self-paced, the usual norms of classroom accountability and discipline do not apply and learning lacks the sense of urgency cultivated in conventional schools (ILO, 2001). Students enrolled in distance education programs often come from disadvantaged groups, performed poorly in primary school, or have been out of school for several years. In other words, on average, distance education students are academically weaker than their counterparts in conventional schools, yet they are required to learn in a manner that is much more demanding, requiring the self-discipline to study individually and the intellectual capacity to understand the lesson materials on their own (Murphy & Zhiri, 1992).

Every distance education program should provide an orientation session where students learn how the system works and what is expected of them (Moore & Kearsley, 1996). Distance programs in secondary education also require frequent and structured face-to-face student support and supervision. Student-facilitator ratios should be kept sufficiently low so as to permit adequate attention to individual students' needs. Face-to-face sessions must be carefully scheduled in a way that is convenient for the greatest proportion of students. The effectiveness of many distance education programs is hindered when teachers and facilitators, unfamiliar with the goals and techniques of distance education, resort to rote teaching methods. For face-to-face sessions to be effective, teachers and facilitators must be trained in participatory methodologies as well as techniques for motivating independent learners. These provisions, critical to the effectiveness of distance education programs, will require sacrificing some of the economies of scale that makes these programs so attractive (Dodds & Mayo, 1992).

### CURRICULUM

The core curriculum of distance education programs should be identical to that of conventional secondary schools. This alleviates parents' skepticism about the quality of the programs, making them more likely to enroll their children in the system. Most parents want their children to continue on to higher levels of education so that it is imperative that distance education programs lead to examinations and certifications equivalent to those of conventional school systems. The experience of many distance education programs also shows that student motivation and success benefit when programs include supplementary lessons and activities in areas relevant to their daily lives and future occupations, including lessons in job-related skills as well as in topics such as agriculture, human rights,

environmental protection, and civic participation. In general, successful programs are those in which students clearly see the benefits of their studies (Murphy & Zhiri, 1992).

#### METHODOLOGY

Learners retain approximately 10% of what they read, 26% of what they hear, 50% of what they read and hear, and 90% of what they say and do (Bosch, 1997). For this reason, it is essential that distance education programs actively involve students in the learning process.

Studies show that learning outcomes do not vary significantly with the use of different media, although distance education planners often give much weight to that particular aspect of their programs. The effectiveness of different media depends more on the content and quality of instructional design than on the type of media employed (World Bank, 1998). Most people can learn appropriately through simple technologies, so that investments in expensive technologies is not usually justified, especially in developing countries where educational budgets are limited and needs are great. In general, a mixture of media is probably the most effective since different students have different learning needs and styles. Nevertheless, each additional medium increases development time and costs, and raises the complexity of administering the program (Moore & Kearsley, 1996).

The primary medium used in distance education is print, which has the advantages of being able to hold large quantities of information that students can access easily, as well as being relatively inexpensive to develop and distribute. Nevertheless, it is difficult to stimulate student motivation through print, and it easily becomes a passive and boring medium. Whenever possible, print should be complemented with audiovisual materials to improve the motivational aspects of distance learning. Many distance education programs rely on radio broadcasts to complement self-instructional print material. Radio has the advantage of allowing for quick and low cost updating, whereas print is more cumbersome to update and reproduce for distribution. Broadcasts also allow students to feel part of a broader learning community, especially when they are interactive. Alternatively, audio learning materials can be delivered via audio cassette. Students often prefer audio cassettes over radio because they can listen to the lessons at their own convenience and as often as they desire. But when a program has large numbers of students, reproducing and distributing audio cassettes can be significantly more expensive than using radio broadcasts (Moore & Kearsley, 1996).

Some distance education programs have attempted to use broadcast television in their courses. Television can be more motivational than radio and is a good medium for demonstrating complex processes, such as those taught in science or mathematics courses. But unless professionally produced, instructional television programs appear amateurish: as a result, in order to be good, they must be expensive. Instructional television usually costs about 3 to 5 times more than radio and requires much larger audiences in order to benefit from economies of scale. Any discussion of broadcast television involves a quantum jump in scale and cost past other available educational media (World Bank, 1998).

But whether using television, audio cassettes, or radio, distance education planners should be aware that producing high quality audiovisual materials, which requires the involvement of persons with specialized skills (scriptwriters, audio/video technicians, editors), will always be expensive.

While internet technology for distance education is expanding rapidly in developed countries, this remains a far-off possibility for developing countries. Poor communications infrastructure, unreliable electricity and telephone networks, and high telecommunications costs present formidable obstacles to connectivity in these countries. For the vast majority of the world's population, access to online learning remains impossible, and their best opportunity for gaining access to an affordable education is through traditional distance learning methods involving print, radio, or television (ILO, 2001). For the time being, the use of computers for learning purposes in the developing world must be restricted to well-designed pilot projects (Wolff & de Moura Castro, 2000).

## INFRASTRUCTURE

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Before selecting media of delivery or launching distance education programs, planners should ensure that the necessary infrastructure is in place. Poor roads and inadequate postal systems can hinder timely delivery of printed learning materials and graded exercises, as well as general communications between students and teachers. Lack of electricity can make the use of radio technology very difficult given that batteries in remote areas can be costly and in short supply. When choosing technologies, program developers must also consider whether students will have access to spare parts and qualified repair technicians if required. Experience shows that when distance education programs try to supply the basic infrastructure themselves, the effort is often fatal to the entire project, either because of spiraling costs or logistical difficulties (World Bank, 1998).

## PROGRAM MANAGEMENT

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Public ministries often assign personnel from other parts of the education system to run distance education programs. But the management of distance education programs requires specialized skills that professionals in conventional education systems often do not possess. These skills include expertise in course development, monitoring and evaluation, student support, broadcasting, production and distribution of educational materials, operation of remote sites, and specialized teacher/facilitator training. Distance education managers must be qualified to make decisions related to the medium of course delivery, the costs of program development, and the enrollment numbers required to exploit economies of scale (World Bank, Pre-Final Draft). In order to develop high quality distance education programs, staff members must receive appropriate training, as required by their new assignments. The distance education system should also strive to develop recognized career paths for its professionals in order to improve its prestige as an authentic system for delivery of education (Dodds & Mayo, 1992).

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## POLITICAL COMMITMENT

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Typically, international donors have shouldered the initial costs of developing distance education programs, with the expectation that national governments would cover the recurrent costs of the system once the initial investments were in place. Experience shows that projects that depend too heavily on foreign aid often collapse when the funding runs out because alternate domestic resources are not available to assume the burden (World Bank, 1998). Changing government priorities have resulted in promising distance education programs being abandoned after initial development, forfeiting the potential economies of scale that program supporters had envisioned. Furthermore, many governments, regarding distance education merely as a tool for lowering educational costs, have been unwilling to fund it at the level required to produce programs of adequate quality. In general, educational planners should keep in mind that distance education programs for adolescents should only be undertaken when governments can commit the necessary resources to run them properly (Dodds & Mayo, 1992). Until this happens, such programs will serve only a fraction of their potential audience and will continue to produce poor educational results.

SUMMARY TABLE

	<b>India: National Open School</b>	<b>South Korea: Air Correspondence High School</b>	<b>Malawi: College of Distance Education</b>	<b>Indonesia: Open Junior Secondary School</b>
Year begun:	1989	1974	1965	1979
Supervisory institution:	Ministry of Education	Ministry of Education and regional boards of education	Ministry of Education	Ministry of Education
Target audience:	Students of all ages without access to secondary schooling	Students having completed primary and middle school (93% between 15 and 26 years old)	Students completing primary school Adults wishing to pursue secondary education	Students completing primary school
Grade levels:	Lower Secondary—grade 10 certificate Senior Secondary—grade 12 certificate	Senior Secondary—grades 10-12		Lower secondary (grades 7-9)
Number of students:	260,000 (to date)	9,960 (1977)	14,000 (1987)	376,620 (1999)
Modality:	Open-Learning	Open-learning	Group-study	Group-study
Media used:	Print Some audiovisual	Print Daily radio broadcasts	Print Some radio	Print Some audiovisual
Frequency of face-to-face sessions:	Evenings and weekends—optional	Every two weeks—mandatory	Daily	Four or five times a week with facilitators Once or twice a week with Base School teacher
Face-to-face facilitators:	Conventional school teachers	Regular high school teachers	Primary school teachers	Facilitators—primary school teachers, university students, religious leaders, etc. Base School teachers—Secondary school teachers
Costs:		U.S.\$61 per student/per years (1976 figure)	(Source states costs in Malawi currency)	(Source states costs in Indonesian currency)

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