Critical Transitions:

Human Capacity Development Across the Lifespan

Beryl Levinger

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EDC
Education
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December 1995

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Foreword

Every day 67,000 people join the already numerous ranks of the world's poor. That means that over the next 12 months nearly 25 million *additional* individuals—women, men and children—will lead a life marked by hunger, disease, substandard living conditions, and few opportunities for a better life. Most of those who will be ensnared in this poverty trap live in the developing world, and seven out of every ten will be female.

In March 1995, world leaders came together in Copenhagen, under United Nations auspices, to attend a Social Summit and commit themselves to a program of concerted actions to reverse this trend. The Summit was a landmark event. Never before had so many heads of state united around a common vision for bringing about a poverty-free planet.

The agreements reached in Copenhagen were revolutionary in terms of their scope and urgency. At their core was a simple yet radical truth: people-centered development is the key to eradicating poverty. In other words, development means much more than higher incomes. It is also about equity, opportunity, empowerment, and participation.

In Copenhagen, governments committed themselves to the goal of poverty eradication "as an ethical, social, political and economic imperative of humankind," by ensuring that "people living in poverty have access to productive resources including credit, land, education, training, technology, knowledge, information and public services." Now, in the post-Copenhagen era, we face a critical question: how can this be achieved? Specifically, what can be done to strengthen national strategies to reduce poverty and narrow the gap between the haves and the have-nots?

One of the most important steps toward achieving the Copenhagen goals is to strengthen the capacity of national governments, nongovernmental organizations, and local communities to promote human capacity development. But to do that, clarity is needed regarding the traits that characterize capable individuals and societies. Likewise, there must be a clear-cut understanding of how nations and individuals—particularly the poor, marginalized and traditionally bypassed—acquire these traits.

The present volume provides compelling insights into the nature of human capacity development and how it can best be achieved. Beryl Levinger has skillfully woven together research from such diverse fields as cognitive science, economics, health, nutrition, futurology, and education to create a book that should be of interest to all developing-country policymakers, program managers, and their colleagues from international cooperation organizations. Her emphasis on *participation opportunities* as the building blocks of human capacity development is bound to stimulate new, empowering initiatives that cut across development sectors.

The United Nations Development Programme is committed to helping countries formulate and implement national policies that are conducive to sustainable human development. UNDP believes that the creation of an "enabling environment" to support this goal is an indispensable prerequisite to its attainment. Such an environment favors growth, gives priority to the poor, and is concerned with sustainable livelihood. It encourages participation, tolerance, respect for human diversity, and the rule of law. *Critical Transitions: Human Capacity Development Across the Lifespan* offers a firm rationale for why these concerns are so critical as well as concrete recommendations for how they should be addressed.

The Copenhagen Summit, along with several other international gatherings, has helped shift the international community's attention away from a single-minded pursuit of economic development and toward the more promising model of sustainable development. UNDP is now poised to help foster the next stage in this evolving understanding of poverty eradication—the transition from sustainable development to sustainable *human* development. Promoting discussion of the paradigm presented in this book is but one way by which we hope to accomplish such a "critical transition."

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chapter 1

Introduction

We can't really predict the future at all.
All we can do is invent it.

—Physicist Dennis Gabor, cited in Pohl, 1993

Yogi Berra, the great American baseball genius, is alleged to have said, "The future isn't what it used to be." Isaac Asimov once observed that a lunar landing had been predicted *long* before the actual event occurred. Yet among all those early prognosticators, not one ever imagined that the whole world would be seeing the event unfold on television. The art of prediction is always performed while standing on a slippery slope.

As the train we call the new millennium inexorably chugs closer and closer to its destination, two trends both predominate and shape the landscape. The first is the *profusion of information technologies*. New facts arrive at incredible speeds. Perhaps more importantly, the number of people with access to this new information is growing exponentially. Indeed, today's pace of knowledge *creation* and degree of knowledge *diffusion* challenge us to redefine such long understood concepts as what it means "to know," "to be competent," and "to learn."

Questions abound for those whose life's work involves "enskilling" people to grow more food, protect the environment, earn more income, raise healthier families, participate more effectively in community development, or achieve a basic education. For example, what will it mean to "be" a student? What do people need to learn and how should they learn it? Will there be any significant difference between "distance" and "traditional" learning? How will "individual" and "collaborative" effort differ from what we understand by these terms today? Who will determine what and how learners learn?

The pattern, rhythm and content of the change process that developing countries are experiencing today will certainly differ from earlier encounters with modernization. Yet, it is instructive to note how the profile of a "typical northerner" has evolved over the last century. This individual no longer lives in a rural area; but, instead, is part of an urban labor market. Our mythical northerner has gone from being a

manual worker to a knowledge worker and, in the process, has shifted from being an isolated farmer to an organizational employee. The features that mark this evolution are the use of more knowledge, more abstract reasoning, and more intelligence to earn one's daily bread. We have entered *the continuing age of the future* (Heterick, 1995).

The second trend, *globalization of the economy accompanied by diffusion of capital*, asserts itself more vigorously with each passing day. Consider the following:

- Foreign investment in developing countries doubled in the two years between 1986 and 1988 (from $12 billion to $24 billion). A second sharp rise, which started in 1990, brought the investment level up to $35 billion by 1992 (Von Furstenberg, 1994).
- Manufacturing in the developed countries is expected to decline from 23 percent of total employment to less than 10 percent within a generation as mass manufacturing shifts to increasingly efficient, low-cost developing nations (Spiers, 1993).
- In the early 1990s, developing countries increased their total imports by 37 percent. At the same time, their exports rose by a more modest 22 percent. This pattern reveals a dramatic departure from historic trends. For the first time, developing countries fulfilled the "locomotive function," pulling advanced economies out of their recession (Woodall, 1994a).
- At current growth rates, the industrial economies will account for less than half of world output by the end of the decade. If this pace persists, then by 2020 the advanced economies' share of global output is likely to shrink to less than two-fifths (Woodall, 1994b).
- The levels of international currency trading and activity in international financial markets are rapidly expanding. The volume of such transactions in 1989 was six times the level achieved a mere decade earlier (Fardoust and Dhareshwar, 1991).

Without question, these two trends—the diffusion of information and the diffusion of capital—respond synergistically and symbiotically to each other. The cascading flow of information makes economic interdependence viable. Simultaneously, economic globalization fuels a seemingly insatiable demand for new and timely information. The

result of this byplay is that the waves of change splash against the shores with greater frequency and more penetrating impact.

New technologies emerge. They induce a profound shift in the creation of national wealth. Raw materials lose some of their value as tangible assets. Correspondingly, the importance of value added to products in the *process* of refinement grows. Information—getting it, evaluating it, applying it, and creating it—becomes the key to national wealth.

In the last few years, discussion has begun in developing countries concerning the need to adapt to these changing circumstances. The proliferation of new, electronic technologies (alongside new inroads made by traditional technologies), new trade relationships, new workplace demands, and the advent of new political systems all serve as powerful invitations to rethink the very underpinnings of *human capacity development*. At the same time, we are challenged as never before with the task of *inclusion*, reaching those who in bygone eras constituted the bypassed. Indeed, it is upon the twin notions of *inclusion* and *participation* that many base their aspirations for a just and equitable world.

For *developing countries*, thinking meaningfully about how to meet the demands imposed by these trends ultimately boils down to giving thoughtful consideration to a single, vexingly difficult question: What is the most affordable, sustainable, and efficacious strategy for building the level of *human capacity* needed to survive and thrive in the emerging context? The present book addresses this question.

But what is "human capacity"? The term refers to an individual's ability to perform tasks which are necessary to survive and prosper. Human capacity has both *personal* and *social* relevance. Capable *individuals* are able to access and use opportunities available in the environment to secure the conditions necessary for themselves and their families to realize their innate potential. Capable *societies*, in turn, are those which can equitably maximize the participation opportunities available to their citizens.

Before developing these concepts further, however, it is useful to define the terms *participation opportunities*, *available participation opportunities*, and *accessed participation opportunities*.

- *Participation opportunities* represent the potential *productive* interactions in which individuals can engage that

allow them to contribute to the development of their nations, communities, and families. Participation opportunities span the course of a person's life cycle and evolve accordingly. They include the chance to go to school, secure gainful employment, influence political or civic affairs, promote family development, and protect the environment. Such opportunities also encompass the chance to partake in agricultural extension activities, cultural events, or entrepreneurial behavior.

- Countries and regions differ in terms of *available participation opportunities*, that is the range of *settings* and *situations* in which these productive interactions are possible at a fixed point in time. For example, in an environment characterized by centralized civic structures, high unemployment and low levels of school enrollment, *available participation opportunities* would be considered relatively scarce. Conversely, in a society where individuals have ample access to education, jobs, the support services needed to raise healthy children, and where there are well-defined occasions to influence community affairs, *available participation opportunities* can be characterized as abundant.

- *Accessed participation opportunities* describe those participation opportunities that individuals actually utilize. As such, they represent a subset of the *available participation opportunities* found in any particular setting. The notion of *accessed participation opportunity* is a modern-day analogue to the old saw, "You can lead a horse to water, but you can't make it drink." A citizen may encounter a participation opportunity, but choose to ignore it. Or, a participation opportunity may be present in the environment but unknown to the individual. Relatedly, opportunities may also be *inaccessible* to some because *gender*, *ethnicity* or *income* serve as *barriers to participation*.

Human capacity development, therefore, is the product of a continual interaction between the individual and society. The capacity development process may be best understood as an ever-broadening upward spiral in which participation opportunities made available by society are accessed by individuals. As their capacities grow, individuals, in turn, respond to their environment by creating *new* participation opportunities, both for themselves and others.

In other words, human capacity development is the *byproduct of participation opportunities that are both available and accessed*. Available participation opportunities represent the set of *inputs* that lead to human capacity development. The *output* of human capacity development can be expressed as the sum of those participation opportunities accessed by individuals and the new participation opportunities created in the course of such engagements.

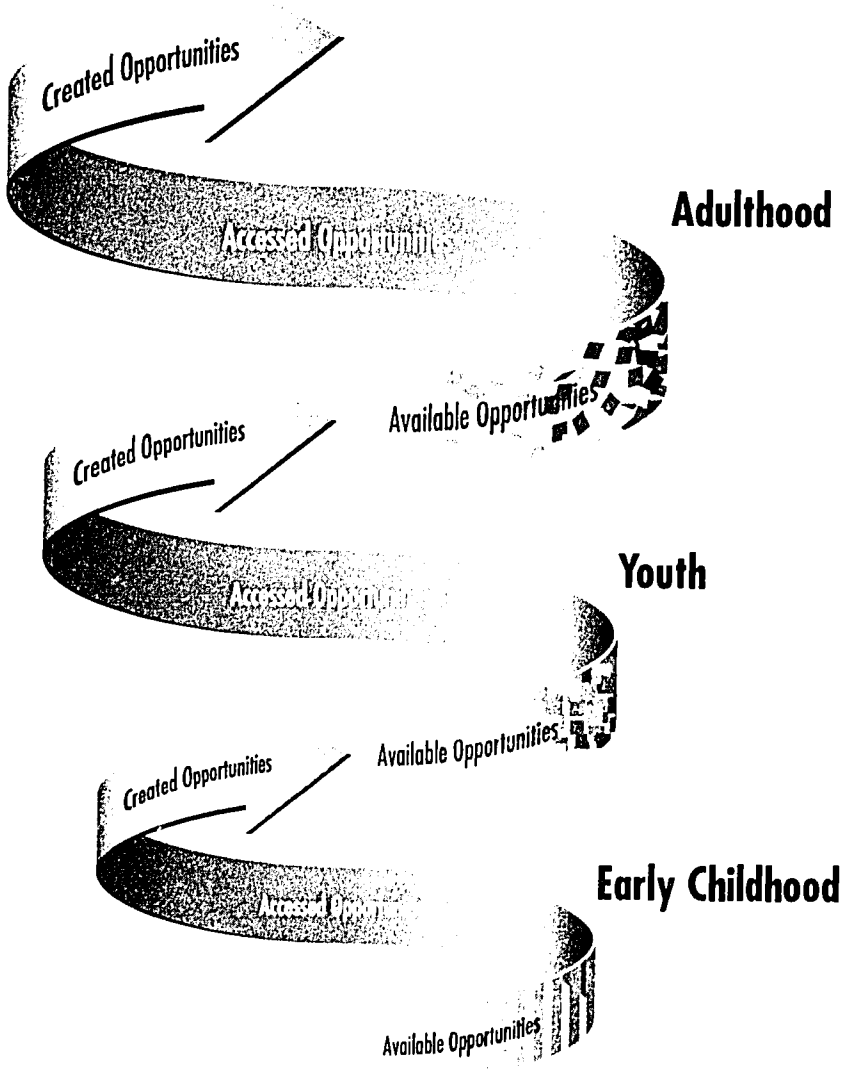
> The following example illustrates the human capacity development process. A quality primary school is available in a rural community (input). A young woman completes primary school, having mastered basic literacy, numeracy and problem-solving skills (first addend of output). These skills allow the woman to recognize the increasing demand for fresh eggs in a rapidly-growing town nearby. These same skills give her the confidence and abilities to approach an agricultural extensionist for assistance (another input). As a result of this consultation, the woman initiates a small egg cooperative through which she and several of her peers earn supplemental income (second addend of output). With the income she receives, she purchases healthful food for her children, sends them to school, and takes them regularly to the clinic for health care when they require it (subsequent participation opportunities that serve as outputs for the woman and inputs for her children).

This book looks at human capacity development as it occurs across an individual's life spectrum. Attention is focused on three life junctures: the period from birth to the age of school enrollment; the years during which, *under optimal circumstances*, basic education takes place; and the period during which livelihood activities—finding and pursuing them—become a central preoccupation.

For each of these life junctures, attention will be given to three critical questions: (1) What are the essential participation opportunities that must be extended to citizens in order to promote sustainable development in the context of a rapidly globalizing, information-rich world? (2) What factors act either as *inhibitors* or *enablers* with respect to the *creation* of these participation opportunities? And (3) what are the *inhibitors* and *enablers* that determine the degree to which such participation opportunities are *accessed*?

Figure 1

The human capacity development cycle



This book departs from the prevailing literature in several important ways. First, it is organized not by sector, but rather by life juncture. Thus, for example, in addressing the essential participation opportunities that must be present at the first stage in an individual's life, education, health, nutrition, and community development considerations are woven together to create a single, unified policy tapestry. At each life juncture, the conditions most favorable to human capacity development are identified.

Second, the book reflects a vision of the future in which the two trends described in this introduction (diffusion of information and diffusion of capital) come increasingly to play major roles in shaping the everyday reality of women, children and men in the developing world. In other words, the analysis that is offered is both future-oriented and based on ascertainable trends.

Finally, the term *human capacity* should be compared and contrasted to its better-known but somewhat distant cousin, *human capital*. Whereas human *capital* focuses on the skills, attitudes and productive capacities of the labor force, human *capacity* deals with the constellation of skills, attitudes and behaviors individuals optimally exhibit in the multiple roles they play: community member, parent, learner, worker, consumer, and citizen. The underlying assumption is that *in each of these roles*, individuals make choices that have a direct and profound bearing on the quality of life that they, their families, their neighbors and their fellow citizens will enjoy.

The analytical framework employed in this book has been designed to facilitate the articulation of complex interrelationships which, in turn, should expedite the assessment of policy options and investment choices. The book examines three levels of the environment (national, community and household) in an attempt to identify the contextual variables (the *inhibitors* and *enablers*) that determine the degree to which participation opportunities are present in that environment. At the macro- or national level, the focus will be on *policy choices* and *investment priorities*. At the micro- or community level, the focus shifts to how these policy choices and investment priorities get translated into services and programs. At the household level, attention is given to those factors that mitigate toward or against individual decisions to access participation opportunities as well as the consequences of these choices.

Two dreams have been pinned onto this framework's fragile corpus: that the model might become useful as a tool to improve program designs, and that it might serve as a paradigm for future program evaluations. Underlying these aspirations is the belief that cross-sectoral approaches to human capacity development are difficult to conceive and implement. But, if done properly, the rewards—to individuals and nations—can be enormous.

Learning in a New Era

Unlike steel or chemicals, circuit design requires no more infrastructure than a workstation and a phone . . . We are not entering a new century. We are entering a new era . . . The very sovereignty of nation-states is being defeated.

—*Business Week*, 1994

The changing world of work

The process of global restructuring is underway. Accompanying this reordering of the world economy are ripples and repercussions that touch every man, woman, and child in both industrialized and developing nations. Technology profoundly alters the ways in which people are expected to work for those who employ them. And, when such expectation goes unmet, jobs (as well as workers) migrate. Indeed, the fluidity of work—in terms of both *content* and *setting*—may be the primary characteristic that distinguishes 21st Century economic reality from that of the past.

Fluidity of workers and jobs is logically the byproduct of a technology revolution that places all planet dwellers within close proximity of one another. Computers, communications satellites and mass transport facilitate an endless flow of information among individuals and groups. Our definition of community is expanded to embrace "virtual groupings" of like-minded, culturally compatible individuals working together to pursue common interests and goals. No matter that they are physically far flung and unlikely to ever meet face to face.

It has been suggested that low-income nations could use "wireless" technology to bypass an entire phase of communications development. Such "leapfrogging" would enable these countries to participate more cost-effectively in the development of a communications infrastructure (*Business Week*, 1994). In an information-driven employment environment, it is the appearance of such infrastructure that sets the stage for a transformed set of relationships between worker and workplace. *Mobility*, both of jobs and workers, is at the heart of this transformation.

But, what does it mean to be part of an information-based society? The answer is found in an examination of its means of production. If production is dependent upon the use of information to increase wealth and improve living standards, then that society is information-based. Knowledge work, in such a context, is the primary work mode, and information provides the primary means by which this work is accomplished (Schlechty, 1991). Reich (1991a) suggests that living in such an information-driven society means that one's capacity to command both tangible and intangible wealth is determined by the value that the global economy places on one's skills and insights.

Hence, one aspect of workplace fluidity is the rapidly evolving set of skills workers need to possess. In addition to the ability to make greater use of information technologies, members of the next generation's labor force will also have to show greater dexterity in the management of complexity. The latter is particularly critical as more and more *batches of jobs* get folded into single positions. What an individual worker brings to the job in terms of education, skills, attitude and self-reliance will assume ever greater importance as organizations increasingly view their employees more as assets and less as fixed costs (Coates, Jarratt and Mahaffie, 1991).

If the first aspect of workplace fluidity relates to the *content* of jobs, then the second aspect surely is the *setting* in which these jobs will be performed. The goal of the new global manager will be to maximize profits by locating production activities around the world in order to achieve the highest returns on investment. Jobs will be exported to wherever it is most efficient and profitable to do business. For example, routine fabrication and assembly will occur wherever workers are available for the lowest cost (Reich, 1991b).

When jobs become mobile, workers must adapt to this change either by relocating (if they can find appropriate work) or by meeting the expectations that their employers hold for them. Already, millions of rural workers are flocking to the cities. At the same time, the lowering of trade barriers diminishes protection for some of the most vulnerable individuals employed in these urban manufacturing belts (United Nations Research Institute for Social Development, 1994).

While job fluidity and mobility pose severe challenges for citizens of low-income countries, demographic trends also favor them. As the population in industrialized countries grows older, the younger, more recently educated populations of the developing world have the opportunity to play a larger role in the global economy.

By the year 2000, fewer than 40 percent of the workers in industrialized nations will be under 34, compared with 59 percent in Pakistan, 55 percent in Thailand and 53 percent in China. When demographic differences are combined with different rates of economic growth, the likely result is a redefinition of the labor market. Countries and companies largely populated with older workers may have greater difficulty adapting to new technologies or changes in markets, compared to those nations with large pools of younger workers. As the world's employers reach across borders to find the younger workers they need, an unparalleled opportunity will present itself to those nations that can develop the capacities of their citizens effectively. Already a profound shift has occurred as tasks once reserved for white collar workers in developed countries are now performed in such developing nations as Mexico, Brazil, India, the Philippines and China (Johnston, 1991).

The exponential growth in world trade and the internationalization of finance are, of course, the outgrowth (as well as the cause) of an increasingly unimpeded information flow. As one business publication recently observed, "Just as Westerners learned in the 1970s and 1980s that manufacturing could be moved virtually anywhere, today it is getting easier to shift knowledge-based labor as well" (*Business Week*, 1994, p. 13).

National, regional, and village-level economies are now intertwined in highly complex networks which are as geographically extensive as they are inherently delicate. Such fragility is exacerbated by the surge of deregulation and persistent recessions which took place in most countries over the last two decades (United Nations Research Institute for Social Development, 1994).

Indeed, recession and indebtedness may well have been important catalysts for the rapid elimination of longstanding economic barriers among nations and peoples. While these changes undeniably create new opportunities, they also impose new pressures. For example, in many developing

countries, small farmers who have long produced for the export market suddenly find themselves competing with larger numbers of similar producers in other parts of the world. Correspondingly, their urban compatriots, if unskilled, are also unprecedentedly thrust into greater competition from an emerging global pool of cheap, increasingly fungible laborers. This competition is heightened by the Soviet Bloc's collapse (itself another manifestation of the forces of global integration) and, with it, the unfettering of vast numbers of low-wage, high-skill workers.

Perhaps compounding this economic volatility is the uncertainty created by recent developments in science and technology. The shrinking of industrial employment is altering the demand curve for unskilled labor. Even if current recessionary trends give way to high growth in the future, the long-term result is not likely to be a significant upswing in the number of low-skill factory jobs throughout the world. The trend in modern manufacturing is toward smaller, more flexible, less labor-intensive operations that are situated near customers. Such technology diminishes the need for unskilled labor. Hence, for many marginalized, illiterate workers, the future holds little promise of a *job* at all. Instead, they will search out *diverse and multiple livelihood activities* (e.g., small-scale gardening, hawking, food processing, and casual labor) which collectively furnish the wherewithal to survive.

New skills for a new world

Globalization, seen from the perspective of the poor, the marginalized, and those who daily struggle to meet their basic human needs, offers not an open-ended opportunity but an ill-defined threat. A skill-poor labor pool encourages global employers to search transnationally for productive people. But with such searches comes the possibility of wrenching dislocations (Kanter, 1991). Migration and increased participation in the informal or illegal economy may be the survival strategy of choice for millions. But such choices do not constitute viable policy options for governments.

As Kanter (1991) notes, "If security no longer comes automatically with being employed, then it must come from being *employable*. Employability security rests on the knowledge that competence is growing to meet tomorrow's challenges. . . ." As gaps between experience levels and wages

narrow around the world, workers will require a new and different kind of preparation for employment. The central thesis of this book can be summarized in two broad statements.

- *The kinds of skills needed to meet the challenge of earning a living in the 21st Century—flexibility, adaptability, collaborativeness and problem-solving prowess—bear a one-to-one congruence with the constellation of skills and outlooks needed to engage in every other key participation opportunity related to human capacity development.*

The second part of the thesis is simple to grasp but challenging to implement.

- *It is possible within the developing country context to create and sustain the infrastructure needed to impart these skills over an individual's life cycle and across a variety of participation opportunities. However, new mental models, assumptions, policies and commitments are essential to such an enterprise.*

It is clear from the foregoing that changes in the emerging workplace make the attainment of higher-order skills a *sine qua non* for long-term employment prospects. But can this analysis be extended to cover other kinds of participation opportunities? Have flexibility, collaborativeness, adaptability, and strong problem-solving skills also become critical prerequisites for effective civic participation, community development, environmental responsibility, and the rearing of sound and strong families? In his discussion of the conditions that make for effective civic participation, Boggs (1992) makes three salient observations which strongly suggest that at least with respect to citizenship in a democratic society, such cognitive skills are indeed essential to effective behavior.

First, he argues, meaningful participation is *context specific*. Debates over such issues as taxes, schooling, leadership, reform, and service provision are deeply rooted in the ongoing, changing lives of adult citizens. Second, the knowledge that adults need to address or influence these issues is at the same time both *continually expanding* and *incomplete*. Weekly, if not daily, there are developments in key issues that challenge the capacity of citizens to respond with understanding and competence. Third, understanding the political environment requires engagement with it. Because the conditions are dynamic, they cannot be fully

comprehended until engagement takes place. Civic knowledge comes out of the interplay between reflection and action (Boggs, 1992).

These same observations can be applied readily to the intersection of worker and workplace. There, too, task engagement is essential to mastery. Likewise, workplace skills are becoming increasingly context-specific. And, whether on the job or at the polling place, essential knowledge requirements continue to expand, because technological development remains forever incomplete.

In his exploration of what democracy means in an information age, Boyte (1989) takes such observations a step further. His thesis is that effective citizenship is predicated upon the ability of individuals to gain access to information of all kinds and to use such information effectively. As information proliferates, it becomes increasingly difficult for the average citizen to both collect and assess all the relevant data. Unlike those in school or the workplace, interactions among citizens in a democracy are, relatively speaking, transactions among equals. As such, no single individual has binding authority over another. The onus rests on every citizen to draw inferences from and act upon information as an independent agent. In short, as democratic institutions proliferate around the world, citizens must, within the realm of their civic lives, increasingly confront ill-defined and novel problems much as they do in the world of work.

The dynamics of participation opportunities related to promoting family development or protecting the environment are similar to those that govern civic and workplace participation. New insights abound about how children grow, develop, and learn. In turn, these new understandings have given rise to a redefinition of essential parenting skills. And, as anyone who has ever reared a child can attest, parenting wisely is the quintessential and constant art of responding to novel situations with effective problem-solving skills.

Likewise, our understanding of the earth's fragility expands exponentially. Fortunately, at the same time that sensitivity to this issue is heightened, so, too, is our understanding of the actions that individuals can take to sustain the earth's bounty. Many of these actions, however, are predicated on sophisticated knowledge, problem diagnosis skills, and an ability to predict the long-term consequences of behaviors.

Thinking to learn, learning to think

If we are willing to accept the notion of human capacity development as *the byproduct of participation opportunities that are both available and accessed* and, if we see such participation opportunities as *productive* interactions which allow individuals to contribute to the development of their nations, communities, and families, then three conclusions are inescapable.

- Accessing existing participation opportunities and creating new ones in an environment of rapid change, information proliferation, and globalization will require that individuals function at higher levels of learning, thinking, and doing.
- The need for these higher-order skills is not just confined to the requirements of the workplace. On the contrary, effective participation in *each* of the four major domains of productive interaction—family life, livelihood, environment, and civic affairs—will increasingly call for these competencies.
- Human capacity development, as we will now illustrate, depends upon enabling large numbers of children, women, and men to acquire (1) *specific content* in relation to a range of participation opportunities, and (2) *specific cognitive strategies for achieving higher levels of thinking and problem solving in these content areas.*

Embedded in these conclusions is an important message: *what* one knows as well as *how* one knows are both of paramount importance. Citizens, workers, and parents must rise above rote, factual levels of information processing. Critical, flexible and creative thinking will assume an ever-greater primacy as individuals confront a growing number of problems that are ambiguous, ill structured and unfamiliar. Indeed, the growth of problems that individuals will encounter and for which they have little or no first-hand information is a consequence of globalization which brings us into contact with the hitherto unknown on a regular basis. Preparing citizens—be they children or adults—to develop high-order skills is an unprecedented challenge. No nation has ever tried to educate all its citizens to be higher-order thinkers.

Schools often perform in ways that defeat the development of necessary cognitive competencies for life in a global era. For example, schools teach skills and theoretical principles

that are supposed to be generalizable and transferrable. Yet, in the so-called "real world," people generally need situation-specific forms of competence. Schools focus on mastery by the individual. Yet, in the world of work, tasks—both mental and physical—are often shared. Schools promote "tool-less" thought. In contrast, outside school, mental work frequently relies on cognitive tools. Schools emphasize symbolic thinking; real-life mental activity, on the other hand, calls for direct engagement with objects and situations (Resnick, 1987a).

This disjuncture between life in and out of school sharply diminishes the transferability of knowledge across environments, settings, and contexts. Yet, such transferability is critical in an era of rapid change. Transfer reflects learning through observation, rule making, and definition. It involves the application of old knowledge in a setting sufficiently novel so that, in effect, it becomes new knowledge (Bruer, 1993).

Increasingly, the field of cognitive science is shedding important insights on how knowledge transfer occurs and the conditions that facilitate it. Essentially, the more varied the kinds of problems learners confront, and the more they have to think to solve them, the greater the chances are that when new real-life problems are encountered, transfer of skills or knowledge to the new situation will occur. This insight is the key to a vision of the future in which the development of higher-order skills might become the paramount goal of all schooling and structured learning programs (Slavin, 1994).

In such a future, notions about teaching, guiding, learning, and intelligence would be reshaped, and relationships among learners, the community and its institutions would be reconstituted. Given the potential contribution of cognitive science to human capacity development, it is worth spending a bit of time to understand a few of the field's over-arching concepts.

Contributions from the field of cognitive science

Cognitive scientists view the world as a series of *task environments*, or problems and settings in which individuals encounter the problem. A *problem* is what happens when a person wants something but does not know immediately what actions must be undertaken to get what is wanted. In each problem there is an *initial state* and a *goal state* (what the person wants). As people solve problems, they determine how to move from the initial state to the goal state.

Most problems that occur in ordinary life have many viable solutions. There is no single correct way to perform many jobs (particularly knowledge-based jobs), raise children, bring about community betterment, or ensure the sustainability of planetary resources. Such tasks are called *ill-defined problems* by cognitive scientists. Clarity about what constitutes an adequate solution comes only after problem solving is begun (Slavin, 1994; Bruer, 1993).

The discipline of cognitive science is a promising vehicle for promoting human capacity development in low-income countries. This assertion stems from the major finding associated with cognitive science research: *It is possible to facilitate a learner's development by helping that individual build better rules to solve problems.* People can be assisted, through explicit instruction, to develop schemas that influence what they notice, recall, and remember. They can learn how to encode information and remember it in appropriate ways. This, in turn, allows them to construct more useful initial representations of problems they seek to solve.

In the 1980s, cognitive science researchers started to observe that there were "intelligent novices," people who learned new fields and solved novel problems more expertly than most, regardless of how much specific knowledge they possessed. These people controlled and monitored their thought processes and made use of general and domain-specific skills in appropriate ways. The conclusion that emerged from this work is that there is more to expert performance than domain-specific knowledge and skills. Indeed, the evidence suggests the existence of thinking skills related to specific domains that can account for differences among individuals in their problem-solving abilities (Perkins and Salmon, 1989).

Such thinking skills might include ways to organize and evaluate information, techniques for selecting relevant facts, and strategies for comparing and contrasting a concept newly learned to one that is well understood. Since the ability to activate prior knowledge enhances understanding and retention, learners might receive explicit instruction in how to access what they already know and connect it to what they are about to learn (a technique called *elaboration*). Other specific skills that might be taught include planning; possibility mapping; means-ends analysis; fact assembly; problem contextualization; problem representation; and problem definition (Beyer, 1988; Resnick, 1989; Slavin, 1994).

Metacognitive instruction would also address the abilities of learners to plan, classify, think divergently, identify assumptions, recognize misleading information, and generate questions. *Metacognition* refers to an individual's ability to think about thinking. It involves being consciously aware of one's role as a problem solver and describes an ability to monitor and control one's mental processing. It is distinct from such other cognitive skills as demonstration of effective memory, the ability to perform defined tasks, or the use of generic strategies for solving new problems (such as outlining a chapter in a textbook in order to bolster comprehension). The individual who exemplifies strong metacognition is one who easily moves from one high-order function in a particular domain to an understanding of functions in another domain (Bruer, 1993). Metacognition is qualitatively different from general thinking and problem-solving skills. A metacognitively aware person is one who can monitor comprehension while undertaking a learning project. In contrast, the poor learner is often unaware that there is a mastery problem and, hence, is unable to take steps to overcome it (Slavin, 1994; Bruer, 1993).

In addition to the ability to predict the results of one's own problem-solving actions, basic metacognitive development includes skills that enable individuals to check the results of their own actions, to track their progress toward a solution, and to gauge the reasonableness of their actions and solutions against some larger reality. Although learners might first develop these skills in the context of some specific subject matter, once learned, they can be applied to other learning situations. However, take note of the caveat: such transfer will occur *only* if the learner has also been helped to understand and internalize the notion that the skills may be usefully applied in other learning situations. In other words, explicit teaching is required for general learning or problem-solving skills to be transferred to new domains. With such teaching, transfer occurs. Absent this instruction, little transfer takes place.

A key to enabling learners to use metacognitive strategies effectively is helping them select which strategies are most appropriate for specific settings. Learners need to know in a context-rooted way which strategies will work and what makes particular strategies especially effective in specific settings. Research shows that learners will transfer a metacognitive strategy to a new situation if they understand why it works and the circumstances under which it can help them to learn.

In recent years, researchers have begun to combine the teaching of thinking skills with instruction in specific content areas. The results of this combination, the *new synthesis*, have been very encouraging (Perkins and Salmon, 1989; Slavin, 1994). The term "new synthesis" has been coined to convey the need to fuse mastery of domain-specific subject matter and thinking skills with general thinking skills and techniques for controlling one's own thinking and learning. What is novel about the new synthesis is that it suggests a need to be as concerned with *how* we teach as with *what* we teach. As Bruer (1993) notes, ". . . if we can apply the new synthesis in the classroom, we should be able to teach school subjects as high-order cognitive skills and help [students] become intelligent novices and expert learners."

The "new synthesis" suggests that domain-specific skills and knowledge, along with an ability to think about one's own thinking and general learning strategies, are all elements of expert performance and intelligence. The basis for this conclusion is that in many different studies, it was precisely this combination of high-order skills that intelligent novices used to apply knowledge flexibly and solve ill-structured, novel problems (Collins, Brown and Holum, 1991; Bruer, 1993).

General programs designed to teach broad-based problem-solving skills are ineffective. It is probably impossible to make people better general-problem solvers. On the other hand, according to the latest work by cognitive scientists, it is possible to teach *general* problem-solving and information-processing skills within the framework of *specific* content and domains (Bruer, 1993). As Siegler (1986) observes, ". . . much of the task of education in problem solving may be to identify the encoding [strategies] that we would like people to have on specific problems, and then to devise instructional methods to help them attain it." While studies suggest that the teaching of general-thinking and problem-solving skills contributes little to improved student performance, it is also clear that curricula which merely transmit facts are not a better alternative.

Research indicates that the transfer of problem-solving strategies to new contexts relates to what the problem is about and how familiar learners are with that content. The more they know about a particular domain, the more likely learners are to use a general memory strategy. As Bruer (1993) notes, "Strategies can help us process knowledge, but first we have to have the knowledge to process," (p. 63).

As we have seen, then, most cognitive scientists believe that domain-specific knowledge and problem-solving methods intimately related to specific domains are the bases of expertise and intelligence. But, how does an individual acquire *new* knowledge?

Over the last thirty years, there has been a widening acceptance of the notion that learning is the process of knowledge *construction*. Such construction, however, is itself knowledge dependent. In other words, new knowledge is the elaboration and extension of previously acquired knowledge. The acquisition of this knowledge is intimately connected to a *situation* which enables individuals to embed learning in an organizing structure (Resnick, 1989). As individuals actively interpret—rather than record—information, they construct new knowledge for themselves. Such construction occurs within a web of social interactions (Vygotsky, 1962; Vygotsky, 1978).

Scaffolding is an important idea derived from Vygotsky's theories. The term conveys the image of an adjustable and temporary support that can be removed when no longer needed by the learner. It refers to the practice of providing learners with ample support during the early stages of learning and then diminishing this assistance as they become competent to take on increased responsibility for task performance. In metacognitive instruction scaffolding occurs as the role of "critic" is transferred in stages from the teacher to the learner (Bruer, 1993; de Baessa, *et al.*, 1994; Collins, Brown and Holum, 1991; Slavin, 1994).

Historically, apprenticeship models of learning adopted similar strategies through modeling, scaffolding, and by making critical skills explicit and overt. Thus, scaffolding evokes the training mechanisms, pedagogical strategies, and instructional techniques that master practitioners use to assist learners in becoming full-fledged members of communities of practice. Unfortunately, in conventional formal instructional settings, content all too frequently tends to obscure or overwhelm the learning strategy and thus render the scaffolding invisible.

In recent years, the *cognitive apprenticeship* model of learning has begun to influence instructional practice in a number of countries (de Baessa, *et al.*, 1994; Collins, Brown and Holum, 1991). In settings where the model is used, teaching methods give learners the chance to observe, engage in, and

invent or discover expert (as opposed to novice) strategies in context. *Modeling*, *coaching* and *scaffolding* are the core of cognitive apprenticeship; they help learners acquire an integrated set of skills. *Guided practice* and *reflection* are methods, within the cognitive apprenticeship framework, that help learners to focus their observations of expert problem solving and to gain conscious access to (and control of) their own problem-solving strategies. *Exploration*, another technique employed within this framework, encourages learner autonomy, not only in carrying out expert problem-solving processes, but also in formulating the problems to be solved.

Overall, the approach is intended to help learners make generalizations about new skills and to foster the transfer of such skills to novel contexts. This is done by identifying the processes within a task, making them transparent to learners, and by situating abstract tasks in authentic contexts so that the relevance of the task is apparent. Learners work at problem solving by actively sharing skills and expertise. The cognitive apprenticeship model also thrusts learners into diverse situations where they are helped to articulate common aspects of the specific task setting in order to maximize the transfer of learning to new settings. Transfer of knowledge is accomplished by unbinding it from a single specific context. Indeed, the independent transfer of skills to novel contexts underpins this framework which combines domain knowledge, general learning strategies, metacognitive strategies, and learning strategies specific to a domain (Collins, Brown and Holum, 1991).

Toward a science of learning for participation across the lifespan

The cognitive apprenticeship framework reflects a growing, research-based understanding that high-order skills require extensive domain knowledge, a grasp of when this knowledge should be used, and the ability to engage in metacognitive monitoring and control. Citizens who achieve these capabilities can solve novel, ambiguous problems. The framework also suggests that when teaching for transfer, the learning facilitator must not only provide many examples of a new concept, but also show how essential features of the concept are reflected in a range of settings.

The cognitive apprenticeship model, Vygotsky's theories about the importance of socially constructed knowledge, and our growing understanding of how metacognitive strategies promote learning transfer are all major develop-

ments that, if harnessed creatively, can help vulnerable populations flourish in rapidly changing, globalizing, information-based societies. However, one might well ask, "Do these ideas have any relevance for the kind of lifelong, continuous learning that adults need to pursue? Or, is their applicability limited to the education of children in classroom settings?"

To respond meaningfully to these queries we need to examine the skills and knowledge that are essential to accessing those participation opportunities that are at the heart of human capacity development: the opportunity to participate in activities that will yield an adequate income; the opportunity to participate in and exert influence on civic affairs and community development; the opportunity to protect and sustain environmental quality; as well as the opportunity to promote family development. We also need to determine whether models developed primarily to improve the learning of children have any applicability to adults. This will be our next task.

Within the adult education literature there is general support for the idea that teaching adults requires different methodological approaches from those used in educational settings that address the needs of children and adolescents (Imel, 1989). Nevertheless, in the last few years the chasm between adult and non-adult education appears to be narrowing as the *socio-constructivist* theories of education—a fusion of recent developments in cognitive science and the work of such psychologists as Vygotsky—gain currency.

Another reason for a crumbling of the walls between the two fields is that the views of Malcolm Knowles, once the most cogent proponent of a distinction between adult and non-adult education, have evolved (Knowles, 1980; 1984). Knowles originally contrasted *andragogical* (learner-centered) methods with *pedagogical* (teacher-centered) ones and held that andragogical approaches were better suited for adults. His assertion rested on the following assumptions: (1) adults are generally self-directing; (2) adults have a rich array of experiences that can serve as learning resources; (3) adult learning is usually influenced by the learner's self-defined need and intrinsic motivation to acquire knowledge in order to solve specific problems or meet specific needs. In light of this "needs-driven" audience, Knowles concluded that adult education lends itself readily to a problem—rather than a subject matter—orientation.

Since he first proposed these distinctions, Knowles has gradually moderated his position regarding the differences between adult and younger learners (Imel, 1989; Feurer and Geber, 1988). What he once viewed as unique characteristics of older learners, he now acknowledges as innate tendencies in all human beings. Such tendencies, he notes, manifest themselves as individuals mature.

This methodological bridging between older and younger learners can also be seen in the more recent literature about how adults can be helped to develop new skills, knowledge, and behaviors. Increasingly, there are references to the notion that adult education should exemplify collaborative and participatory learning (Brookfield 1986). This is characterized by interactions in which both facilitators and adults are active participants in the learning process. The intent is to eliminate the hierarchy between facilitators and learners while creating a sense of community. In this collaborative model, knowledge is constructed rather than transferred. Furthermore, knowledge is considered to be found within the community rather than in the individual (Whipple, 1987).

The basic assumption undergirding collaborative learning is that knowledge is best constructed in a social context by communities of individuals. Furthermore, the shaping and testing of ideas is a process in which anyone can participate (Imel, 1991). Because learning is significantly enhanced when new knowledge is created, transmitted, and shaped by group activities, the facilitator's role as a source of authority is significantly diminished.

This model involves a departure from the traditional view of learners. In collaborative learning settings, adults function as problem solvers, contributors, and analytic discussants. As participants grow to accept the view that learning should be *interactive*, the emphasis shifts from competition to collaboration with peers. Adults are assisted in developing the skills they need to learn *interdependently* rather than *independently*.

A number of theoretical benefits are associated with this collaborative learning approach. The setting is considered to provide an environment for democratic planning, decision making, and risk taking as participants develop insights into the power and potential of groups as well as the interdependence of their members. As individuals

develop better judgment through the exposure and resolution of previously unshared biases, they also develop self-confidence which has long been considered essential to such risk-taking behavior as the adoption of new technologies.

Finally, the model enables adults to develop metacognitively by giving them both a framework and encouragement to tap into previous experiences and knowledge (Imel, 1991). To date, there has been little research regarding the efficacy of the collaborative learning model in adult education settings, despite strong theoretical support for its premises.

The subject of this book is an investigation of human capacity development across an individual's lifespan. The view proposed herein is that the essence of such development is an individual's ability to access and create (either directly or indirectly) available participation opportunities. This means that to promote human capacity development we must know a great deal about the specific knowledge and skills needed to access and create participation opportunities *at different stages in an individual's life*. In this context, some "life stage" framework for human capacity development would be very helpful. Armed with such a framework, it would be a simple task to mesh *approaches* and *content*. Unfortunately, no such framework exists despite a significant body of work on sequential models of adult development and analogous work by Piaget and others for children.

The reasons that the work of these theorists (including Jung, Buhler, Erikson, Havighurst and such recent thinkers as Levinson, Gould and Sheehy) proves inadequate for an enlarged understanding of human capacity development as we have defined it is that their models are psychological in nature. They remain, by and large, silent on our two most salient issues: (1) what skills and knowledge enhance an individual's capacity to access or create participation opportunities; and (2) what methodological approaches are most suited to the development of such skills and knowledge?

Similarly, it can be argued that the distinctions between *pedagogy* and *andragogy* are not helpful to our task of understanding more about human capacity development for two important reasons. Neither term conveys any specifics with regard to the *content* to be acquired by learners. The terms pave the way for establishing a false dichotomy with respect to how individuals become more competent by overstating differences between older and younger learners.

As the trends of globalization and information cascade manifest themselves with increasing vigor, the need to help citizens gain the skills required to transfer knowledge and solve novel problems grows. We cannot afford to mislabel processes that will result in a misapplication of resources.

We, therefore, propose the creation of a new learning science, *partagogy*. Its primary focus is to help individuals develop the skills and knowledge they need to access available participation opportunities and create new ones over the course of their lifespans. The participation opportunities with which partagogy concerns itself are related to four core domains of human behavior and national development: family life; livelihood; civic affairs; and environmental stewardship.

Table 1

Partagogy's four core domains

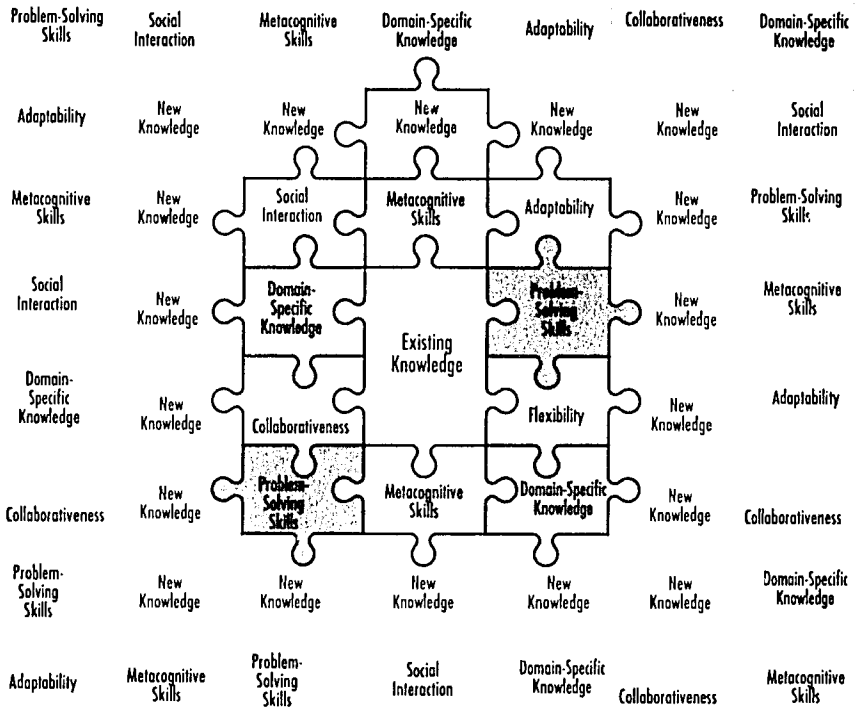
Core domains:	The ability of individuals to...
Family Life 	secure the conditions that they and their fellow family members require to realize their innate potential.
Livelihood 	create and manage a portfolio of activities which yields adequate income, at a minimum, to meet basic needs.
Civic Affairs 	contribute to and meaningfully influence the discussion, debate and resolution of issues that concern either a local community or some broader unit of civil society.
Environmental Stewardship 	protect natural resources and maintain biodiversity by conserving, improving and properly managing air, water, and soil quality.

Partagogy is inextricably tied to a particular view of human capacity (as opposed to human *resource*) development. This view holds human capacity development to be *the byproduct of participation opportunities that are both available and accessed*. Available participation opportunities represent the set of *inputs* that lead to human capacity development. The *output* of human capacity development can be expressed as the sum of (1) those participation opportunities accessed by individuals; and (2) the new participation opportunities created in the course of such engagements.

Partagogy, unlike andragogy or pedagogy, has both a methodological foundation and a content basis. The content side of partagogy will be explored in the next three chapters as we attempt to identify the knowledge and skills essential for human capacity development at three life-cycle stages along with the policy environment essential to their application. A concluding chapter will return us to the question of methodological considerations as we seek to put some flesh on the bones of partagogy.

Figure 2

The creation of new knowledge: an open-ended process



Partagogy Summarized

Partagogy is a science of learning specifically designed to foster human capacity development. Partagogy views human capacity development as a twofold process which involves augmenting the degree to which an individual (1) accesses *extant* participation opportunities; (2) contributes to the creation of *new* participation opportunities. A fundamental tenet of partagogy is that as individuals increasingly access existing participation opportunities, they begin to create new opportunities for themselves and others. It is this ongoing interplay between opportunity access and creation that leads to heightened levels of human capacity development.

Illustrative participation opportunities include:

- activities that protect or promote the health of oneself and one's family
- schooling for oneself and one's children
- extension activities oriented toward sustainable agriculture
- informal sector income-generation activities
- collaborative community development efforts

The participation opportunities with which partagogy is concerned relate to four core domains of human endeavor and national development: family life, livelihood, civic affairs, and environmental stewardship.

Partagogy's *content* and *methods* are designed to help individuals acquire the skills, knowledge, attitudes, and behaviors needed to *access* and *expand* the inventory of existing participation opportunities. Knowledge transfer, in particular, is seen as a prerequisite skill for creating new participation opportunities across the four core domains. Thus, the practice of partagogy applies socio-constructivist theories of learning which place a premium on helping individuals learn how to:

- work collaboratively in the construction of new knowledge
- use existing knowledge to construct new knowledge
- develop metacognitive skills that facilitate the transfer of previously acquired knowledge to new settings and novel problems

Partagogy is distinctive because of the *combination of characteristics* incorporated into its practice. These include:

1. *The application of socio-constructivist theories of learning.*

2. *Specific content, related to the four core domains, which is presented in a well-defined methodological framework.*

3. *An emphasis on methodological consistency.* In practical terms this means, for example, that partagogical approaches must be used with young children as well as their parents; with pupils as well as their teachers; and in the training or supervision of development workers as well as with the community members they serve.

4. *Applicability to individuals across the lifespan.* Partagogy recognizes that human capacity development is an ongoing, lifelong activity. Partagogy's content and methodology, however, are specifically tailored to each life stage:

- *early childhood,* from the prenatal period to the age of school enrollment
- *the basic education years,* the period when, under optimal circumstances, basic education takes place
- *adulthood,* the time when earning a livelihood for oneself and others is a central life task

5. *An emphasis on nurturing the linkages between human capacity development and institutional capacity development.* Capable *organizations* are essential to foster the development of capable *individuals.* Therefore, a partagogical approach to human capacity development includes such institutional capacity development characteristics as:

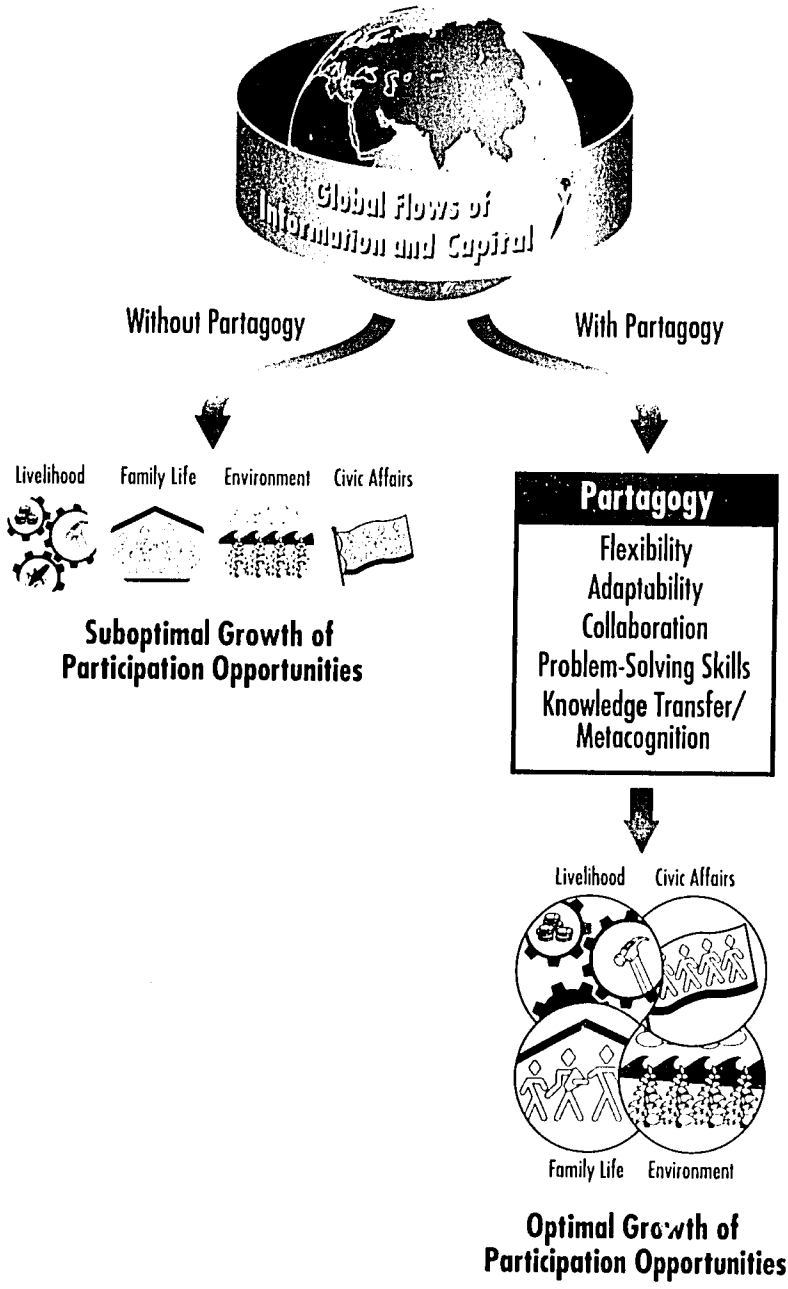
- collaborative approaches to problem solving
- staff training that involves individuals in group work, cooperative vision sharing, and systematic efforts to build on current expertise in the acquisition of new skills
- systematic transfer of existing organizational expertise to new problems and settings

Project *design* and *evaluation* implications related to partagogy's concern for enabling individuals to access and create opportunities for themselves and others include:

- the need for designers to identify explicitly the set of critical participation opportunities associated with the lifespan stage(s) to be addressed by a project
- the need for project designs to correspond with and build upon a community's inventory of current participation opportunities and the access patterns associated with them
- the need to focus on identifying ways in which (1) *prevailing participation opportunity access patterns* are inimical to human capacity development; (2) the steps required to alter them; (3) the changes that occur in them over time at the individual, community and regional levels

Figure 3

The role of partagogy in human capacity development



Young Children and the Potential to Participate

Child development cannot be broken up into separate domains. A child's learning capacity depends on an interactive process of health, nutrition, and child-caregiver interaction.

—Mary Young, 1994

Introduction

A country's level of human capacity development is reflected in the *predisposition* and *ability* of its citizens to *access* and *create* opportunities for earning a living, promoting family development, protecting the environment, and participating in civic affairs. How and when are such predispositions and abilities developed? A compelling body of research suggests that many of the differences between individuals in terms of their *participation behaviors* can be explained by what happens to them very early in life. Even before birth, factors are already in play that will shape—for better or for worse—an individual's potential to take advantage of existing participation opportunities or create new ones.

Child development is a dynamic and interactive process. Infants and young children who enjoy psychosocial support, adequate nutrition, good health, and cognitive stimulation (the necessary prerequisites for child development) are likely to actively explore their environments and engage their caregivers in developmentally beneficial interactions (Levinger, 1994). Studies of youngsters enrolled in early childhood development programs that provide these necessary ingredients indicate that the effects of such a "package" are both long lasting and profound (Myers, 1992).

The most ambitious of these investigations is the High/Scope Perry Preschool Study which has followed a population of disadvantaged, African-American preschool graduates for over 20 years along with a matched control population that did not have the preschool experience. The initial treatment consisted of exposure to a cognitive development curriculum as well as home visits designed to improve parenting skills. The latest findings, obtained when

the cohort had reached age 27, reveal significant differences between the two groups in three of the four major participation opportunity domains. The graduates had higher employment rates, were less likely to start a family as teenagers, were more likely to enter into marriage, and less likely to commit crimes (High/Scope Educational Research Foundation, ND and Consultative Group on Early Childhood Care and Development, 1993a).

Other researchers have found strong and positive relationships between the quality of a child's early development experiences and primary school performance. Participation in comprehensive programs that include health, nutrition, and cognitive stimulation lead to increased primary school enrollment rates, lowered primary school enrollment ages, enhanced academic performance, improved retention, and reduced drop-out and repetition rates (Levinger, 1994; Glewwe, *et al.*, 1994; Consultative Group on Early Childhood Care and Development, 1993a and b; Glewwe and Jacoby, 1993; Myers, 1992; UNICEF, 1992). The evidence continues to mount that, from the time of conception, children are profoundly influenced by their early experiences and environment. Indeed, the degree to which they will reach their full potential as adult members of society is significantly shaped during gestation and the early years of life.

As we have seen, exposure to a developmentally facilitative environment is critical to an individual's future behavior vis-à-vis participation opportunities. But what are the characteristics of such an environment? What makes a particular setting *facilitative*?

The interplay of health, nutrition and psychosocial support

In essence, the prerequisites for optimal development are met when attention is given to the child's mental, social, emotional, and physical well-being. Unfortunately, such holistic thinking is often hard to achieve. The boundaries of sectors and disciplines that exist within and among entities concerned with the futures of children all too often operate at cross-purposes with the kind of service integration needed to meet a young child's developmental requirements. The health and nutritional status of a child are, of course, important areas of concern; so, too, is the child's progress in attaining social, psychological and cognitive competence. The interactive relationship of health and nutritional status on the one hand, and social, emotional

and cognitive development on the other hand, frequently go unrecognized. While good health and nutrition undergird psychosocial development, the converse proposition is also true. Social, psychological and cognitive growth contribute to a child's health and nutritional status (Landers, 1992).

The young child's development occurs as a result of many productive *transactions* between child and caregivers. These transactions enable the child to form basic ideas about objects and spatial relations, to develop language abilities, and to acquire a host of interpersonal skills including the ability to interact with and make demands upon caregivers and family members. As with any successful transaction, all parties contribute to and gain something from the exchange. The infant or young child offers a range of reflexive, auditory, visual and affective capabilities to the caregiver. In turn, the caregiver responds. The product is the growth of love bonds that shape the relationship between the participants and enhance the child's emotional and cognitive development (Trout, 1981). Such bonds also serve as an impetus to respond to the child's health and nutritional needs.

It is difficult to erect neat divisions between a child's physical state and cognitive development. Children who are malnourished or chronically ill are both physically and intellectually disadvantaged. Studies show that young children who suffer from protein-energy malnutrition (PEM) are likely to have impaired physical growth and brain development. Such children often have attentional deficits and are less motivated to respond to and engage in productive transactions with the adults present in their environments. Similarly, inadequacies of iodine intake (either prenatally or postnatally) have been shown to cause neurological disorders, deafness and reduced intelligence in young children. Other micronutrient deficiencies also impair a child's development. Both iron and vitamin-A deficiencies, for example, impede brain growth and are associated with impaired intellectual abilities (Levinger, 1994).

This delicate interplay between the psychosocial and physical aspects of child development can be seen quite clearly in three bodies of research. The first deals with the efficacy of intervention strategies designed to meet the needs of children who are both nutritionally and intellectually

vulnerable. When young malnourished children with developmental deficits are exposed to both nutritional supplementation and intellectual stimulation, they tend to benefit more than when the treatment consists either of supplementation alone or cognitively oriented interventions without nutritional inputs (Levinger, 1986).

The second body of studies to illustrate the interplay between physical and psychosocial development relates to the sensory stimulation of infants and young children and the effect it has on physical well-being. Touch deprivation in babies, for example, has been linked to digestive problems, marasmus and even, in cases of severe deprivation, death (Rice, 1985). Studies on low birth-weight babies show that even a brief regimen of massage (three 15-minute sessions per day over a ten-day period) leads to increased weight gain *without* additional caloric intake (Field, *et al.*, 1986).

Finally, research on the effects of breast-feeding also highlights the intimate linkages between physical and psychosocial well-being. Nutritionally, breast milk and colostrum provide all the protein and nutrients infants require. The skin-to-skin contact of breast-feeding as well as the milk itself may transfer immunizing bacteria and antibodies to infants. Furthermore, the act of breast-feeding with its holding, touching, eye-to-eye contact, talking and responding, enhances the infant's emotional resiliency and psychosocial development (McClure, 1989).

As we have seen, the pattern of children's physical, cognitive and emotional maturation is a byproduct of their health, nutrition, and psychosocial status. Children develop rapidly and in a highly differentiated way. Thus, it is necessary, in attempting to identify the factors that *enable or inhibit* child development, to examine the needs of young children in terms of specific age subgroups and developmental factors. In our analysis, we will discuss four discrete waystations on a child's journey toward maturity: the prenatal period; toddlerhood (which runs from birth through age two); the young child stage (which covers ages three through five); and the optimal period of primary school entrance (ages six through eight). At each of these stages, we will examine how an array of nutritional, health, and environmental factors constitute the chalk that is writing on a virtual *tabula rasa*.

The prenatal period

During this period, the mother serves as gatekeeper. Fetal development is entirely dependent on whether she admits into her own system those elements that are essential to a healthy pregnancy. These include adequate nutrition, a relative absence of stress, timely medical care, and sufficient education to make informed choices on behalf of her future son or daughter.

Nutrition plays a critical role in fetal development. When nutrition is adequate, the newborn's intellectual capacity is strengthened. Research in developing countries indicates that when malnourished women receive protein supplements in the last trimester of their pregnancy, their children's cognitive functioning is improved. Such benefits are observed to age six or seven (Hicks, *et al.*, 1992). Furthermore, when maternal supplementation involves both protein and kilocalories and is extended to include the neonate, then effects can be sustained into adolescence and even young adulthood (Pollitt, *et al.*, 1993).

Maternal malnutrition and inadequate weight gain during pregnancy increase the risk of having a low birth-weight baby. Such infants are more likely than other newborns to have hearing, vision, or learning problems, each of which carries significant implications for limiting individual ability to take advantage of available participation opportunities. A study undertaken in the US found that 15 percent of *very* low birth-weight children and nearly 5 percent of low birth-weight infants require special education services, compared to 4.3 percent of children born at normal birth weight (ERIC Clearinghouse on Elementary and Early Childhood Education, 1994). Other investigations suggest that low birth weight results in subtle cognitive and language acquisition delays as well as differences in IQ (Hack, *et al.*, 1991; Largo, *et al.*, 1986; Aylward, *et al.*, 1989; Wilson, 1985; Cohen and Parmelee, 1983; Hunt, 1981). In one recent study (Hille, *et al.*, 1994), investigators found that very premature or very low birth-weight infants were at significant risk for grade retention. By age nine, 32 percent of this US sample had already repeated a grade.

When maternal malnutrition takes the form of iodine or iron deficiency, the fetus suffers an assault to its well-being. Iodine deficiency leads to stillborn births or newborn deaths at the rate of five to ten children per 1,000. Additionally, one in five maternal deaths is linked to iron deficiency in developing countries (World Bank, 1994b).

Iron deficiency during the prenatal period is also associated with premature birth and low birth weight. Infants born too soon or too small often face serious and fatal threats. Indeed, low birth-weight infants die during the neonatal period at a rate 40 times that of other infants (Samuels, 1986; Overpeck, *et al.*, 1992).

When considering the nutritional status of mothers, one must also consider the beliefs and practices of the culture that affect the quantities and types of food expectant mothers will eat. A number of sociocultural factors play an important role in malnutrition. Such factors go beyond the abundance and availability of food. For instance, in some countries special food taboos exist for pregnant women. Expectant mothers choose to be malnourished. They realize that if they eat less, they will have a smaller baby. And, if they have a smaller baby, their own chances for survival will be greater, even if their baby dies. This logic is driven by a belief that it is the mother's survival, and not the baby's, that will ensure continuity of the species (Myers, 1992).

Maternal levels of stress also play an important role in fetal development. Where stress is high, labor is often difficult and births are more likely to be premature. Stress increases the secretion of adrenaline and cortisone which pass through the placenta. Researchers hypothesize that such problems are related to the effects of elevated levels of these hormones on the fetus (Blomberg, 1980; Sameroff and Chandler, 1975).

Another source of maternal stress during the prenatal period is an unwanted pregnancy. In one study of an international sample of mothers and newborns, difficult labor and premature delivery were markedly present for women experiencing an unwanted pregnancy, even when they had access to adequate prenatal care (David, 1981).

The importance of prenatal medical care is highlighted by a growing body of research. Studies undertaken in the US and elsewhere suggest that women who obtain prenatal care have infants with higher birth weight than women without such services. This finding is true regardless of other background characteristics (Schwartz, 1990; Donaldson and Billy, 1984; National Commission to Prevent Infant Mortality and Institute for Educational Leadership, 1992).

Adequate prenatal care may well serve as the first critical participation opportunity available in the life cycle. When quality care is available, mothers receive vital nutritional supplements, appropriate information and some of the emotional support needed for a successful pregnancy. Prenatal care may take many forms. Medical clinics, peer support groups or trained traditional birth attendants can all offer the essential elements of prenatal care if the needed inputs are at their disposal.

Environmental variables can work to enable or inhibit mothers' access to prenatal care. Factors such as availability of medical facilities, medication and nutrition supplements; cultural practices or taboos with regard to pregnancy; and the relative isolation of the mother, either help or hinder expectant mothers' access to these vital services.

Finally, an important factor influencing child development during the prenatal period is a mother's schooling. Studies indicate that even modest levels of education (for example, to the level of literacy) equip individuals with the knowledge and skills to use medical resources more efficiently. This suggests a greater propensity on the part of educated expectant mothers to avail themselves of prenatal care including nutritional monitoring. Of course, educational levels also correlate to household incomes which, in turn, confer the economic wherewithal needed to obtain an adequate diet, housing and health care (Cochrane, *et al.*, 1982).

From birth through toddlerhood (0–2 years)

Unlike humans in later stages of life, infants begin the learning process with no prior cognitive experience to guide them. What infants lack in experience, however, they make up for in receptivity. Unique physiological wiring allows healthy infants to learn in months the equivalent of what older learners may take years to master.

Such receptivity has one caveat, however. Infants are entirely dependent upon their external surroundings for the nourishment, stimulation and "information" they need to thrive and develop. The extent to which infants and young children receive "inputs" from the external environment, therefore, largely determines their later capacity to learn actively and participate fully in the world around them (UNICEF, 1992; Landers, 1989; McClure, 1989; Levinger, 1994).

A substantial body of research highlights several inputs which significantly affect the development of infants and toddlers. These include adequate *nutrition, physical and sensory stimulation, attachment to a stable caregiver,* and *maternal education.* We shall examine each of these factors in turn.

The evidence that *nutritional status* exerts a powerful influence on how infants and toddlers develop is quite compelling. Iron deficiency in infancy may cause a permanent loss of IQ later in life (ERIC Clearinghouse on Elementary and Early Childhood Education, 1994). Additionally, infant anemia is often the cause of impaired motor development; increased fearfulness; inattentiveness; and reduced social responsiveness (Consultative Group on Early Childhood Care and Development, 1993a; Levinger, 1994).

Protein-energy malnutrition (PEM) in young children also has a deleterious impact on subsequent developmental outcomes. This condition is associated with reduced play and exploration as well as with increased apathy and irritability. The result is impaired cognitive development. PEM affects the formation of infant synapses and dendrites, thereby impinging upon the child's school readiness and ability to concentrate (Levinger, 1994; Landers, 1989).

Studies suggest that a child without *adequate physical and sensory stimulation* will experience high levels of apathy and, overall, stunted development. Babies ignored on a regular basis become listless and introverted. They withdraw from their external environment which, in turn, leads to stunted psychological and physical development (UNICEF, 1992). Indeed, touch deprivation in the early years of life has been linked to physical and emotional problems in later years, including digestive problems, difficulty in maintaining relationships, and even, in severe instances, marasmus (Myers, 1992; Rice, 1985). On the other hand, physical and sensory stimulation can enhance a young child's physical growth, emotional security, resistance to disease, cognitive functioning and coordination. The mechanisms that account for these developmental gains are not fully understood although such stimulation is thought to foster neural development which is not complete at childbirth (Myers, 1992; UNICEF, 1992).

Attachment to a stable caregiver significantly contributes to an infant or toddler's psychosocial, cognitive and emotional development. Investigators have found a strong emotional

bond between infants and specific caregivers beginning in the infant's sixth month (Isabella and Belsky, 1991; McClure, 1989). Such attachment is fostered by a caregiver's ability to attend to the infant's signals and respond promptly and appropriately to the infant's needs. In this fashion the infant recognizes that its signals initiated the response (Ainsworth, *et al.*, 1978).

Secure attachment is associated with positive emotional, social, and cognitive development as children grow older. Not only do shared emotional relationships between caregiver and child elicit vocalizations and accompanying facial expressions from the adult that are attractive to the child, but such exchanges function as the precursors to language learning. Infants and young children use the caregiver's speech and facial expressions to begin to associate objects and events with words. For optimal development of language skills, however, infants must be in contact with "reasonably nurturant talkers" to talk themselves into language (Locke, 1994).

With respect to *maternal education*, research indicates that a mother's education correlates with decreased infant mortality rates. A study undertaken in Kerala, India, for example, found that this relationship could be explained by a greater use of available medical services on the part of better schooled women (Jain, 1985). Another investigation (Cochrane, *et al.*, 1982) determined that each additional year of a mother's education signified a 9 percent decrease in the mortality rates of her very young children and infants.

The young child (3–5 years)

The entire process by which a child develops is best understood as a continuum rather than as a series of discrete stages. Junctions rather than disjunctures typify the child's expanding ability to engage in complex transactions and to make sense of chaotic environments. In keeping with this view of *developmental continuity*, the young child's needs between ages three to five represent an extension of the child's requirements for healthy growth and development during toddlerhood: adequate *nutrition*, *physical and sensory stimulation*, *attachment to a stable caregiver*, and *maternal education*. Of course, during these years a child's ability to interact with the environment undergoes dramatic changes. Dependence upon adults diminishes, sense of self evolves, and cognitive skills develop.

We will now turn our attention to an identification of critical environmental features that can either *enable* or *inhibit* the child's efforts to achieve optimal development. Our concern, specifically, is how inputs during this period of the young child's development influence behaviors vis-à-vis participation opportunities that present themselves later in life.

When nutrition is inadequate, the young child's physical and cognitive activity levels are reduced. Food supplementation continues to have an ameliorative effect on the physical and cognitive development levels for children at risk (Levinger, 1986).

Among three- to five-year olds, anemia has been found to cause delays in cognitive and motor development (as is the case with infants). Anemia has also been linked to increased apathy and insecurity in social interactions. In general, malnourished children tend to cope with their condition by self-limiting mental and physical activity, which leads to a spiraling of their cognitive deficits. However, some studies have shown that when physical activity was encouraged among malnourished two- to four-year olds, the children became more active and gained more weight than their less active counterparts. In these investigations, the active group received the same caloric intake as the controls, but they expended 30 percent more calories. Since such activity may well contribute to cognitive as well as physical development, this finding suggests the vast potential of interventions that combine attention to the psychosocial as well as nutritional needs of children (Field, *et al.*, 1986; Levinger, 1994).

As with infants, *positive interactions with adults* continue to be very important to the healthy growth and development of children between ages three and five. Research conducted with children in this age range and adults indicates that when adults initiate and explain tasks that are appropriate to children's needs, the young learners will in turn develop and adapt goal-directed behavior, particularly when the tasks involve cognitive function. The children demonstrate a high level of responsiveness to the adult guidance and instruction that they receive (Saxe, *et al.*, 1987). The implications of this work are profound: cognitive development in very young children is linked to the *social interactions* they encounter in the learning setting.

When productive interactions with adults are absent from the child's environment, the result is often an underestimation of the young child's ability. Frequently, the child experiences high levels of frustration and diminished self-confidence. Often, the naïveté and pre-causal reasoning exhibited by children of this age group lead parents and preschool caregivers to underestimate their capabilities. The strong, pervasive message of Piagetian theory has been to wait for the logical thought that should emerge between the ages of five and seven before presenting tasks that require logical reasoning skills. New research, however, has suggested that if problems are presented to preschoolers in familiar contexts and do not rely solely on verbal skills, they can be solved. In many cases, preschoolers can "show you the answer" but not "tell you the answer" (Carey and Gelman, 1991; Gelman and Baillargeon, 1983; Karmiloff-Smith, 1986). Such findings are, of course, wholly consistent with the socio-constructivist approaches to learning described in Chapter 2 of this book.

Cognitive science research indicates that knowledge acquisition and mastery is very domain-specific during these years. The areas of social interaction, musical ability, and mathematical reasoning skills, in particular, are unevenly developed in some three-to-fives. Thus, a child may speak in complex sentences and possess ample vocabulary, yet be unable to recognize that water poured from a tall, thin container to a short, wide container retains the same volume of water (Carey and Gelman, 1991; Gelman and Baillargeon, 1983; Karmiloff-Smith, 1986). If the development of problem-solving skills and knowledge transfer are important to long-term human capacity development, then it is at this age that many important cognitive strategies can be introduced that foster these outcomes.

In general, interactive learning is particularly important as a vehicle for the development of new cognitive abilities. This view builds on an ever-increasing body of research which demonstrates that learning is the process of knowledge *construction*. Such construction, however, is itself *knowledge dependent*, and often the product of domain-specific problem-solving strategies which allow the young learner to elaborate upon and extend what is already known. Interactivity is essential because knowledge acquisition is intimately connected to a *situation* which enables young children to embed their learning in an organizing structure (Resnick, 1989). As they actively interpret and process infor-

mation, they construct new knowledge for themselves. Such construction occurs within a web of social interactions (Vygotsky, 1962; Vygotsky, 1978).

Key components of the interactive learning process include opportunities for children to derive conclusions and formulate questions independently; to learn through social interactions and play; to acquire knowledge based on individual motivation and interests; and to learn through a repeating cycle of awareness-exploration-inquiry-utilization (UNICEF, 1992; Consultative Group on Early Childhood Care and Development, 1993b).

The primary school entrant (6–8 years)

The beginning of primary school marks an important transition for young learners. They must, simultaneously, leave the insular world of home and perhaps a child-care program while responding to dramatic new social and cognitive demands that are foisted upon them. As school-aged children begin to develop sophisticated thinking, problem-solving and communications abilities, the prime focus of attention shifts to social relationships and the acquisition of basic life competencies, particularly in the areas of literacy and numeracy (UNICEF, 1992).

The emergence of symbolic thought during these years allows children to link abstract numbers and symbols with concrete values and sounds. As their capacity for abstract reasoning grows, children are able to view themselves, their actions, and their own thinking process. The potential for metacognitive activity and emerging new cognitive skills allow children to solve a variety of problems, ranging from the use and counting of money, to the responsible caretaking of younger siblings.

At this stage, children's ability to access and create new participation opportunities begins to depend more and more upon their prior access to such crucial inputs as nutrition, sensory stimulation, and positive interactions with adults. However, research indicates that even if such vital inputs were lacking during early childhood, consistent access to, and use of, nutritional supplements, active learning environments, and supportive adult and peer networks can enable previously deprived children to participate more fully in the world around them (Levinger, 1994; de Baessa, *et al.*, 1994).

Among children entering primary school, poor health, hunger caused by short-term fasting, poor nutrition and inadequate psychosocial support all constitute significant risk factors. They threaten the development of the youngster's Active Learning Capacity (ALC) which can be defined as *the child's propensity and ability to interact with and take optimal advantage of the full complement of resources offered by any formal or informal learning environment* (Levinger, 1994).

Such nutritional problems as iron deficiency, for example, are associated with lethargy and impaired intellectual performance. Investigators have found that iron deficiency in school-aged children is correlated with a host of problems such as reduced alertness, attention, concentration, intellectual performance, and interest in the immediate environment. Children with deficient iron stores often display increased irritability, and poor achievement as captured by their performance on tests and promotion rates (Levinger, 1994; Myers, 1992; Landers, 1989).

Many children in developing countries arrive in school while engaged in short-term fasting. This is particularly common when familial dietary practices include one relatively large meal daily which is offered at midday or late in the afternoon. By the time school begins, the child who has not breakfasted may well be in the midst of a short-term fast which can last from 15 to 20 hours. The attendant hunger adversely affects attention, interest, and learning (Levinger, 1986).

A great number of investigations conclusively demonstrate that social and environmental factors influence intellectual ability. Today, there is an emerging consensus that one such environmental factor is protein-energy malnutrition (PEM) which is estimated to affect 210 million school-aged children worldwide (Berkley and Jamison, 1991). The presence of PEM has been negatively associated with such indicators as cognitive test scores, school performance, verbal comprehension, and attention span.

PEM wields its influence in two ways. When it occurs *prior* to school enrollment, the condition appears to reduce many basic aptitudes associated with satisfactory schooling outcomes. *Current* PEM diminishes a child's ability to concentrate and respond to present-day situations. Activity levels, so essential to exploratory behavior and the construction of

knowledge, are reduced. At the same time, irritability, listlessness and distractibility appear to intensify. Studies of children in Kenya and the Philippines showed that good nutritional status was a more important indicator of cognitive ability and school performance than socioeconomic status or academic quality (Levinger, 1994; Myers, 1992). Health status also exerts significant influence on a child's ALC and, hence on school success. Acute respiratory infection, severe measles, and diarrheal disease (frequently associated with vitamin-A deficiency) are linked to school absenteeism and low rates of school completion. Blindness, which can result from severe vitamin-A deficiency, precludes school participation in many developing countries (Levinger, 1994).

Among school-aged children, parasitic infections are very common. Prevalence data suggest that in some parts of the developing world this condition is virtually universal among school-aged children (Levinger, 1994). A growing body of research on the effects of such infections on the lives of children points to impaired health, stunted growth, diminished nutritional status, and reduced cognitive function. The impact of parasitic infection on schooling outcomes manifests itself through high levels of school absenteeism, under-enrollment, and heightened attrition. Depending upon the type of parasitic infection, symptoms that have a bearing on the child's schooling experience include growth retardation, chronic colitis, iron deficiency anemia, impaired psychomotor development, fever, weakness, lassitude, muscular pain, nausea, vomiting, diarrhea, and fatigue (Levinger, 1994; Lockheed and Verspoor, 1991).

In speaking of the child's health, nutrition and level of hunger, we are addressing the *quality of the child* sitting in the classroom. However, other factors within the schooling experience are also important if children are to develop the problem-solving and knowledge-transfer abilities that they will need to access existing participation opportunities and create new ones later in life. *Instructional quality* is also a critical factor in any examination of how schools contribute to human capacity development.

While there is a vast research literature on how instructional characteristics influence learning (please refer to Chapter 4 for a fuller discussion), there is also consensus on key points. Task- or problem-oriented instruction, opportunities for individual, small-group and collective work, inquiry-

based learning, structured development of metacognitive strategies and integration of several knowledge domains are acknowledged to stimulate active participation in the learning process. These elements enable the learner to construct new knowledge in social contexts. In turn, this lays a foundation for developing the skills needed to solve novel problems, transfer concepts to new settings and construct new knowledge that builds on what the child already knows. These competencies are, of course, the fundamental building blocks of human capacity development. They constitute a citizen's "tools of the trade" for securing a livelihood, promoting family development, and contributing to civic betterment in an era of rapid change.

Policy considerations

If human capacity development is the goal, then the major challenge confronting those who make policies that affect the lives of young children is how to *bundle inputs* so that they are affordable, sustainable, and "meaningful" in terms of the influence they exert on a child's ability to both access and create participation opportunities. Inputs that bear on the course of a child's development are present at many different levels of a societal structure. Bronfenbrenner's Ecological Model of Human Development (1979) provides a highly useful framework for examining both the web of inputs essential to child development and the policy environment needed to ensure that these necessary inputs will be forthcoming.

The model describes the individual as an interdependent part of a larger ecological system. The developing person resides within nested concentric structures, each interacting with the other. The model identifies four structures in particular:

- ***The microsystem***, or the context in which individuals experience a pattern of activities, roles, and interpersonal relationships. For children this includes their home and relationships with parents, siblings, and other caregivers. As children develop, the microsystem expands to include school and those who teach them.
- ***The mesosystem*** comprises the interrelations between two or more settings in which an individual actively participates. For young children, the mesosystem defines the interactions among parents, siblings, other caregivers, and later on, their teachers.

- ***The exosystem*** describes settings that do not involve individuals as active participants, but which, nonetheless, influence their development. For the child the exosystem can include the parents' workplace and economic opportunities, the family's network of social support, as well as the policies and practices of local governing bodies.
- ***The macrosystem*** refers to the factors that shape or could shape the form and content of the other systems described above. With respect to early childhood development in low-income countries, the macrosystem is the policy framework that offers a blueprint for programming to support the comprehensive development of young children.

As Bronfenbrenner's model suggests, child development may be *endogenous* (i.e., a natural outgrowth of a family or community structure) or *exogenous* (i.e., conceived, implemented or funded by actors outside an individual's immediate family or community circle). An integrated, holistic approach to child development would entail concern for *practices* (primarily in the family setting), *programs* (generally delivered—although not necessarily conceived—in the community setting) and *policies* (usually the product of regional or national strategies and deliberations). The challenge is to build the necessary connective tissue so that practices, programs and policies come together seamlessly in ways that expand the number of participation opportunities a young child is likely to access and create over the course of a lifetime. One way to promote the necessary articulation among these three spheres of influence on a child's development is to apply a set of criteria to determine the *cohesiveness, efficacy* and *adequacy* of proposed interventions. The Three-C Framework (for continuity, comprehensiveness, and coordination) is such a criterion-based assessment approach. We will now look, in turn, at each of the "C's."

Continuity refers to *the importance of planning and implementing specific strategies to sustain the gains a child makes as a result of policies, programs, and practices* that are introduced to promote healthy growth and development. Investigators have determined, for example, that long-term benefits to US children who participate in Head Start, a comprehensive early childhood development program, are curtailed if similar interventions are not maintained in later years. Studies

now reveal that children's cognitive gains drop off sharply by the time they reach the third grade if the tailored, intensive interventions provided in Head Start are not supported in later years (McKay, *et al.*, 1985). Unlike inoculations which must be administered only once to build immunity, children need interventions that promote and sustain their development as they move from one stage to another, and from one learning setting to another.

Comprehensiveness relates to the *mix of services across programs, and the ability of this mix to foster and sustain children's development over time.* Comprehensiveness is that aspect of a program that allows it to respond to the needs of children across developmental domains. When a program is comprehensive, attention is given to the child's physical, cognitive and psychosocial development.

Children's lives are intertwined with the people and institutions that surround them. Participation opportunities that address the needs of the people and institutions in a child's microsystem—whether parents, siblings, caregivers, or schools—can reflect and support the complex interactions among children, families, and the community. Comprehensiveness reflects the belief that child development cannot be broken up into separate domains.

Coordination refers *not only to the integration of program activities across domains but also to the integration of a program with respect to the environment in which it operates.* In this sense, coordination focuses attention on a program's ecology.

Early childhood development theory and implications for the practice of partagogy

Partagogy, as we noted earlier, is a new science of learning that is essential for optimal human *capacity* (as opposed to human *resource*) development. Partagogy is relevant throughout the lifespan, since its goal is to help individuals over the course of their lives to develop the skills and knowledge needed to access available participation opportunities and create new ones. The skills and knowledge fostered by partagogy are crucial for the creation of participation opportunities across four separate yet interrelated domains: securing a livelihood; promoting family development; protecting the environment; and contributing to civil society or community development. Partagogy's concern with participation opportunities stems from a view of human capacity development as *the byproduct of participation opportunities that are both available and accessed.* Available par-

ticipation opportunities represent the set of *inputs* that lead to human capacity development. The *output* of human capacity development can be expressed as the sum of (1) those participation opportunities accessed by individuals; and (2) the new participation opportunities created in the course of such engagements.

Partagogy has both a methodological foundation and a content basis—in contrast to andragogy or pedagogy which are neutral with respect to the knowledge, skills and behaviors they seek to develop in learners. The methodology and content associated with partagogy reflect research findings on the factors that *enable* or *inhibit* participation behaviors linked to human capacity development.

In relating the notion of partagogy to the early years of an individual's life, six major conclusions readily emerge. First, ***the period between conception and age eight is critical in terms of setting the stage for an individual's future participation behaviors.*** Enrollment in and completion of primary schooling, for example, are tied to experiences that occur in early life. As detailed in the following chapter, schooling, in turn, significantly affects labor force participation, an individual's ability to promote family development, and such outwardly-oriented behaviors as participation in civic affairs or environmental action. Furthermore, secure bonding in a child's early years is essential for the development of self-confidence and the belief that one's actions and behaviors matter. This belief is linked to participation in civic affairs, community development and environmentally responsible actions.

Second, ***a partagogical approach to early childhood development depends upon creating new competencies, attitudes and behaviors on the part of adults who hold responsibility for programs and policies with the potential to shape a young child's environment.*** If one were to attempt to coin a catch phrase that best expresses the quintessential imperative for operationalizing the partagogical approach to early childhood development, it might be *"facilitation through integration."* In other words, the *facilitation* of a young child's development occurs optimally when there is an *integration* of services that promote the child's mental, social, emotional and physical well-being. Such integration requires planners and implementors to develop new skills that lead to the intersectoral design and coordination of activities. New attitudes are also essential in order to willingly forego the comfort of traditional ministerial arrangements and

relationships. However, without the skills and attitudes conducive to an abandonment of this zone of comfort, *facilitation through integration* can never be achieved.

Third, from a methodological perspective, ***a partagogical approach to early childhood development requires that young children and the significant adults in their lives be given the opportunity to construct their own knowledge in social settings.*** In short, it is not only young children for whom a socio-constructivist approach to growth and development is essential. The adults or older siblings who care for them must also have the opportunity to develop metacognitive skills that facilitate the solution of novel problems and the transfer of knowledge to new settings and situations.

The implications of this assertion are far reaching since they suggest a whole new set of training requirements for teachers and other paid child development workers. Such professionals need to understand not only how children learn best, but also how to communicate the essentials of child development in ways that are partagogically sound for adults. Thus, for example, the oft-delivered talk on nutrition or child development would fall by the wayside to be replaced by problem- and discussion-oriented outreach to caregivers. Small-group work would become a feature of many interactions among peers, regardless of whether the peers are adults or children. In other words, the socio-constructivist orientation deemed desirable in promoting *child* development would also constitute the framework for promoting *caregiver* development.

Thus, *modeling*, *coaching* and *scaffolding*, the core skills of cognitive apprenticeships, would be the techniques of choice for helping caregivers acquire an integrated set of child development skills. Similarly, *guided practice* and *reflection* would be suitable techniques for enabling adults and older siblings to make productive observations about the young children for whom they care. Then, on the basis of these observations, learners might select from among alternative strategies those actions most conducive to supporting a young child's healthy growth and development. *Exploration*, another approach to learning associated with the cognitive apprenticeship model, could also be used to develop a caregiver's ability not only to solve child development problems that are externally identified, but also to gain self-confidence in formulating the problems to be solved.

The advantage of such methodological consistency (using similar techniques with both *caregivers* and *"care receivers"*) is twofold. Caregivers become more motivated to use the approach when they themselves experience the growth and learning it engenders. The method also enhances the learner's self-confidence and ability to successfully confront new child development challenges.

A fourth conclusion to emerge from this analysis is that ***the specific content of a partagogically-oriented curriculum geared to caregivers must be drawn from multiple domains.*** Included in such a curriculum would be broad problem-solving skills related to maternal nutrition; child nutrition; prenatal care; prevention of unwanted pregnancy; and techniques for promoting the sensory, cognitive, and emotional development of young children. Explicit instruction on why, when and how to access local services that promote child development would also be extended. In this manner, adults would develop the necessary self-confidence to avail themselves of these resources (and participation opportunities) in a timely and appropriate fashion. A partagogical curriculum might also seek to improve a mother's basic literacy and numeracy skills when deficits in these areas are significant. Throughout the curriculum, both domain-specific knowledge and metacognitive skills would be explicitly developed with an eye toward creating strategies that promote the transfer of knowledge to new settings.

A fifth conclusion arising from the present discussion is that ***a child's transition to primary school involves two important processes: readying the child for school*** **and** ***readying school for the child.*** For the *child*, readiness is a product not only of cognitive, social, and emotional development, but also a reflection of health and nutritional status. For the *school*, readiness involves the capacity to incorporate and build upon a child's previous experience. Since new knowledge is constructed in social settings from existing knowledge (the essence of socio-constructivism), a partogogical approach to working with children would call for moving from the known to the unknown in terms of language, patterns of relationships, abilities and knowledge.

In many developing countries this recommendation would translate into greater use of the vernacular, a modified mirroring of traditional practices for teaching children new skills, and greater reliance on folklore (in particular, songs, games, stories and local cultural festivities). Similarly, there

would be an increased concern with the erection of bridges between abstract, theoretical thought, on the one hand, and activities that are part of a child's daily life, on the other. Heightened attention would be paid to *getting the school ready for the child* by systematically building on the knowledge, relationships, traditions, and practices which comprise the fabric of each school entrant's life. Early childhood development initiatives would be viewed as valid in their own right, as important investments in human capacity development rather than frilly initiatives designed only to prepare the child for primary school.

The final conclusion that can be drawn from this discussion of the link between early childhood development and partagogy is that ***no single service delivery model or approach is definitively best under all circumstances***. Rather, there is a broad range of acceptable options depending on costs, needs, and preferences.

One program model is the *direct delivery of services* to children through home day care, integrated child development centers (in or out of the workplace), preschools, and the downward extension of primary school. Another alternative is to improve the skills of caregivers whether parents, siblings, members of the extended family, or adults outside the kinship group. Home visits, parental education, mass media, and child-to-child outreach have all been successfully employed in low-income countries to reach caregivers.

Activities that improve the quality of home-to-school transition, whether home- or center-based, would be essential in light of the importance that has been attached in this discussion to the creation of settings that enable children to use what they already know to construct new knowledge. The value of any such program, regardless of type or venue, must be viewed as a function of the degree to which it promotes a child's Active Learning Capacity as defined earlier. The essential requirement for all programs concerned with home-to-school transition is that they offer young children structured opportunities to engage in problem-solving and active, inquiry-based learning. Such opportunities should be combined with attention to the health and nutrition status of children as well as their level of short-term hunger. This mix of concerns can be responded to in conventional day care centers as well as in home-based programs. The promotion of good parenting skills may also make it possible for these requirements to be met in any child's home environment.

Training and social promotion directed toward caregivers may be highly effective in helping young children acquire the necessary foundation for lifelong participation in activities related to promoting family development, earning a living, protecting the environment and contributing to civic life. Such training, however, should allow for face-to-face contact in group settings, in keeping with the constructivist underpinnings of partagogy. Mediated communication (radio, pamphlets or photo-comics) can complement, extend and reinforce such highly interpersonal encounters.

The experience of many low-income countries and an incontrovertible set of studies about the lives of young children should convince even the greatest skeptic to accept two key premises. First, the process of human capacity development cannot be postponed. Child development occurs within a window of opportunity. If the opportunity is missed, then development potential is squandered. Second, given the menu of suitable (albeit not optimal) interventions, there is an option for every national budget. The only cost that is too high is the one that must be borne by countries that choose to wait until children reach school age before undertaking systematic efforts to address their needs.

Basic Education—A Critical Participation Opportunity

Basic education creates healthier families that themselves are better educators of their children. Quality schooling increases economic productivity. It develops higher social and psychological morale, as the population, obtaining what it believes to be its right, gains a greater sense of social and political participation. From this participation, a "deeper development" is created for longer-term structural change and is sustained by people's capacity to make improvements in their own lives. In turn, other development projects—improved water, disease prevention, sanitation, roads, agricultural extension and industrialization—are more likely to succeed.

—Martin Carnoy, 1992

Introduction

In many low-income countries, basic education, that level of formal schooling that covers the years of primary and early secondary instruction, is in a state of flux. It, along with most other political and economic institutions that comprise the warp and woof of national fabric are being reinvented. Discussion abounds about how schools—often severely overburdened and under-resourced—can help citizens acquire literacy, numeracy and the ability to apply these skills to such everyday problems as raising a family, earning a living, behaving in an environmentally responsible way, and meeting the demands of informed citizenship. Indeed, as noted in Chapter 2, the context in which these functions occur is itself rapidly changing; therefore, it follows that the preparation of learners to exercise these roles must also undergo transformation.

To be sure, reinvention is not an easy task as tensions caused by competing agendas, conflicting priorities and limited resources abound. How can educational quality be improved when, in many countries, coverage still remains an unsolved problem, particularly for girls and ethnic minorities? How can the new insights about how people learn (see Chapter 2) be applied in settings where many children cannot afford books and do not sit at desks?

Nevertheless, these tensions must be resolved, for education's impact on the development process, while not fully understood, is decidedly both vast and positive. A brief examination of the developmental outcomes most closely linked to basic education can serve as a useful platform from which to construct new insights into the process of human capacity development.

Basic education's contribution to the development process

Generally speaking, inquiry into the relationship between basic education and long-term development is designed to address one or more of the following questions:

- What is the *net value* (expected benefits minus costs) to the *individual* and to *the economy* of different kinds and levels of education? How does investment in basic education compare to investments in secondary, tertiary, and nonformal education?
- How does basic education influence *labor force productivity?*
- What relationships exist between basic education and standard measures of *economic growth?*
- What relationships exist between basic education and *political* or *civic behaviors?*
- What are the *social benefits* associated with basic education including both *intra-* and *intergenerational* effects?
- What are the development implications of *inequitable access* to education for girls, ethnic minorities, or the rural poor? How does inequitable access to educational opportunity perpetuate "relative disadvantage"?

Each of these questions will be examined in turn. A *brief synthesis* of relevant findings will be presented in order to stake out a strong claim for the notion that basic education must be a critical component of any human capacity development strategy. Once this claim has been adequately bolstered, our attention will shift to an identification of those factors within basic education that most directly *enable* human capacity development.

Basic education's net value to the individual and to the economy. Several international comparisons have been made of the rates of return on education in developing

countries and, generally, the same conclusions emerge: in most countries, basic (primary) education yields higher *social* rates of return than any other level of education (Psacharopoulos, 1993, 1985, 1980, and 1973; Levinger, 1977). This finding stems from the fact that basic education inputs are less costly than those for higher levels. At the same time, basic education reaches greater numbers of learners than secondary or tertiary education.

The same pattern emerges with respect to *private* rates of return on investments in basic education. More than twenty years ago Schultz noted that, ". . . the highest private rates of return in most of the developing countries are to be had from additional investments in elementary schooling mainly from completing the fifth to the last elementary year" (Schultz, in Thompson and Champion, 1972). Recent investigations continue to confirm this pattern and suggest that disparities between social and private returns are greatest in the lowest-income countries (where there is virtually no middle class) and at the highest levels of education (King and Hill, 1993).

What accounts for the incredible robustness of basic education as an investment? It has been suggested that four years of schooling, at a minimum, are needed for a person to remain literate for a lifetime. Once literate, the individual has the ability to "decode, interpret and act efficiently," thus taking advantage of technical change and new economic information (Schultz, 1972). Although these benefits increase with more education, when the total real costs of the additional education are calculated (including opportunity costs), the rates of return tend to be highest for the fifth and subsequent primary school years in most developing countries (Levinger, 1977).

Basic education and labor force productivity. Recent research suggests that a significant productivity differential exists between those with primary schooling and those with none at all (Psacharopoulos, 1985). This difference is greater than the gap in productivity between primary-school graduates and those with higher levels of education (World Bank, 1994a).

In the *agricultural* sector, studies indicate that four years of basic education significantly increase farm output. This is particularly the case in those areas that are influenced by "modern" agricultural procedures (Lockheed, Jamison and

Lau, 1980; Jamison and Lau, 1982; Moock, 1994). Such environments are characterized by the availability of new crop varieties; the use of such inputs as insecticides, fertilizers and machinery; and the presence of market-oriented production procedures. Significantly, these studies also note that educated farmers are more likely to practice erosion control (a key participation behavior within the partagogy domain of "protecting the environment").

Productivity gains have also been documented in the formal wage sector. Most economists who have examined this issue posit that, theoretically, a worker's efficient use of production tools is rewarded by higher income. Several studies confirm the expected pattern (Schultz, 1961; Denison, 1962; Harbison, 1973; McMahon, 1984; Becker, 1964). To be sure there are some labor market distortions that mar this assumption (public sector employment patterns, for example). Nevertheless, the research suggests that investments in basic education account for most of the impressive increases in real earnings per worker over the last several decades across a wide swath of the developing world (Schultz in Blaug, 1971; Lockheed, Jamison and Lau, 1980; Jamison and Lau, 1982; Moock, 1994). This finding appears to hold for both *urban* and *rural* workers.

While basic education is thought to increase productivity in the *informal, non-farm* sector, few definitive studies have explored this linkage. This primarily reflects the difficulty of collecting data on productivity or wages and represents a fruitful line for future inquiry. However, one study that examined the impact of basic education on *women's wages* found that income rises by 10 to 20 percent for each additional year of schooling. This finding is particularly significant since women's income is often derived from informal-sector activity, but relatively little is understood about the role education plays within that sphere of the economy (Summers, 1992).

With respect to female *labor force participation*, researchers found that more education leads to an increase in the duration of labor force participation among women (Psacharopoulos and Tzannatos, 1992). An additional year of schooling was found to increase the average length of female labor force participation by three years.

Basic education and economic growth. The approach used by economists to determine what portion of economic growth is attributable to education often involves study of the *residual*, i.e., that part of growth which cannot be directly attributed to capital or labor inputs. In many studies, the educational improvement of a country's labor force over time is used to explain such expansion. As Selowsky (1967) explains:

> *The study of the sources of economic growth has become . . . an important part of the economic literature. A frequent approach to this problem has entailed the use of an aggregate production function: the typical result has been that the traditional factors—land and capital—explain only a fraction of the observed changes in output, leaving a substantial "residual" or unexplained part of the economic growth rate.*
>
> *For several countries, the increase in the amount of education of the labor force, and therefore in its productivity, has explained a substantial part of this residual. The result has shifted attention from the earlier . . . emphasis on physical capital toward a more general conception of capital accumulation in which human capital plays a more important role.*

What are the assumptions made by those who study the residual? Denison, a pioneer in this area, argued that education influences aggregate growth through its effect on labor quality. According to Denison, educated people are more likely to possess initiative and flexibility. Such people, therefore, perform better than their uneducated counterparts. Denison further assumed that increased education implies a better labor market information system with a resulting increase in labor allocation efficiency. Finally, he reasoned that as economic growth occurs, the need for technologically trained individuals familiar with basic work techniques and amenable to modern working conditions would become greater (Levinger, 1977).

Such assertions are borne out in the numerous residual studies that have been conducted over the last thirty years (Peasle, 1965, 1969; Lau, Jamison and Louat, 1991; World Bank, 1994a). These investigations demonstrate that differences in educational levels (the "stock of human capital") can help explain differences in productivity levels, growth rates, and per capita incomes. Furthermore, this body of work provides persuasive evidence to support the claim that investments in human capital, particularly at the level of basic education, yield returns which compare favorably with those on physical capital.

Some of the illustrative findings drawn from these investigations include the following:

- Primary education is the single largest contributing factor to economic growth in Asia's newly industrialized economies (World Bank, 1994a). Virtually every Asian country that experienced rapid economic growth during the 1970s and 1980s had established universal enrollment in basic education by 1965 (Eisemon, 1987; Adelman and Robinson, 1978; Jamison and Lau, 1982).

- Between 1850 and 1960, none of the world's most prosperous nations enjoyed significant expansion of their economy without having first achieved universal primary education (Peasle, 1965, 1969).

- Primary education powerfully affected economic growth in fifty-four developing countries from 1945 to 1980 (Jamison and Lau, 1982).

- Threshold levels of basic education must be reached before a country experiences accelerating growth (Azariadis and Drazen, 1990; World Bank, 1994a).

Basic education and political behaviors. Since the late 1950s, social and political theorists have linked popular education to democracy. They assert that education leading toward literacy can reinforce individual attitudes, values and beliefs that are supportive of democratic institutions. Furthermore, they suggest that the individual effects of education on democratic behavior are stable over time and contribute to the long-term political stability of democratic systems (Hyman and Wright, 1979; Almond and Powell, 1978; Lipset, 1959). The virtue of education most frequently mentioned by these theorists is the creation of an informed electorate. Education enables individuals to increase their capacity to make rational decisions, resist extremism, and improve their tolerance for diverse viewpoints. Literacy is generally seen as a necessary prerequisite to these outcomes (Lipset, 1959; Cutright, 1969).

The primacy of literacy (and hence, basic education) is also suggested by a cross-national study that examined both developed and developing countries between 1950 and 1970 (Ramirez, Rubinson and Meyer, 1973). The researchers found that primary-school enrollments have significant effects on the development and retention of formally representative regimes. In contrast, the expansion of secondary

and tertiary schooling seemed to contribute little or nothing to the development and support of democratic institutions.

Education also appears to bolster democracy through its contribution to decreasing differentials between the lower- and higher-income groups within a society. Several researchers suggest that education moderates the distribution of income and, thus, serves to reduce income gaps between rich and poor (Verba, Nie and Kim, 1978; Psacharopoulos, 1982, 1993). Smaller gaps, they argue, increase the political power of lower-income groups and create a foundation for representative government. Although expanded basic education works to equalize political bargaining power, increased state inputs into the secondary and tertiary education levels appear to skew the power balance between income groups and, thus, perpetuate repressive elites.

Various studies have concluded that educational attainment is the most significant factor in explaining political attitudes. One investigation found that education was more important than gender, occupation, income, and age in accounting for political viewpoints (Almond and Verba, 1963). Several investigators have traced democratic values such as cooperation and respect for others to specific teaching practices and school attributes (Reimers, 1993; Chesterfield, 1994; Torney-Purta and Schwille, 1986).

Education has been linked with the general presence of political and civil liberties in society (World Bank, 1991a). A regression analysis, using cross-national data, was performed for measures of overall development. In that study, political and civil liberties were positively associated with women's education and overall education, among other variables. The findings indicated a strong *interdependent* relationship between political and civil liberties and educational attainment (Schimpp, 1992).

While studies such as the foregoing indicate *interdependency* between democratic forms of government and education, *causality* is difficult to establish. There are several factors that influence the development and maintenance of democratic attitudes, values and actions. Clearly, education is one such factor. However, it is difficult to ascertain which of the many education-induced ripples most directly influences the advent and maintenance of democratic governments. Is it education's power to redistribute income? Is it the ability

of some schools to create democratic experiences which can serve as the basis for cooperation in later life? Or is it, perhaps, the capacity of schools to create a literate citizenry?

Most likely the answer lies in some combination of these explanations.

Two studies on the impact of basic education on democratic behaviors have profound relevance to the development of a partagogical approach to schooling. In Guatemala, children were exposed to a curriculum that featured constructivist principles, active learning, peer teaching, collaborative knowledge creation, the use of self-instructional guides, and collaborative student government. Observers noted significantly more instances of turn-taking, directing others in an activity, and the availability of positive performance feedback than in a matched comparison group. Democratic behaviors were not only more frequent for children in the constructivist setting, but were also qualitatively different. Specifically, the majority of turn-taking, collaborative behavior and supplying directions to others took place in the naturally-occurring contexts of children's small-group interactions (Chesterfield, 1994).

Another investigation in Latin America (Reimers, 1993) also lends support for the notion that democratic principles of participation can be imparted through a constructivist approach to learning. The Colombian New School program (Mogollon, Colbert de Arboleda, and Levinger, 1977) is based on participatory, discovery-based learning. It is characterized by frequent class discussions; cooperative, heterogeneous work groups; skills-based and mastery learning; active participation by parents in homework, school decisions and extracurricular activities; self-instruction; individual projects; flexible teaching-learning styles; and a highly participatory student government experience. This program was shown to foster confidence in children and help them learn democratic forms of organization and participation.

While the linkages between basic education and democracy are present, several authors have found that this relationship between education and democracy is not a historical constant (Kamens, 1988). Karl, for example (cited in Rauner, 1993) asserts that what some social scientists once considered *preconditions* for democracy (per capita income, universal literacy, access to different levels of education) may

actually be its *outcomes*. The current context of far-reaching and rapid transition, especially in the former Eastern Bloc countries, leads some to believe that in emerging democracies, a democratic education system is a necessary though not sufficient precondition for the development of a democratic social and political structure.

Basic education and social development. Many of the private and social returns to education are attributed to nonmarket benefits that are both intra- and intergenerational. These include improvements in life expectancy, family health and nutritional status, as well as decreased fertility rates for women. When the student sitting in the basic education classroom is a girl, she is likely to have fewer but healthier children. She is also more likely to insist on ensuring the futures of *all* her offspring by sending sons and daughters alike to school. The education of both boys and girls makes it that much more probable that the next generation of girls, as well as of boys, will become healthy and educated (Summers, 1992).

While educating both boys and girls is a sound investment, the social benefits attached to education are especially profound when girls gain access to schooling. A persuasive body of research suggests that female literacy and education have important long-term effects not only on family size or maternal and child health but also on *natural resource utilization* and *environmental conservation* (USAID, 1994a). Indeed, the World Bank's World Development Report of 1992 noted that improving girls' education contributes to environmental conservation and sustainable development.

In the US, schooling has been shown to exert significant influence on students with respect to their environmental awareness and attitudes (Trisler, 1993). However, such impact is achieved only when environmental issues are closely connected to the lives and experiences of learners. This finding is fully consistent with socio-constructivist theory and a partagogical approach to human capacity development.

Some researchers have suggested a close connection between environmental responsibility and the development of good citizenship. In both areas, the goal is quite similar: to promote responsible behaviors that reflect concern for individuals as well as the broader societal groups in which individuals hold membership (Ramsey and Hungerford, 1989).

It has been posited that sound environmental stewardship is dependent upon four key factors: (a) knowledge of environmental issues; (b) knowledge of specific action strategies to apply to these issues; (c) the ability to take action on environmental issues; and (d) the self-confidence needed to take action (Hines, Hungerford and Tomera, 1987). These elements are all linked to schooling, either directly (as an instructional consequence), or indirectly (through the acquisition of literacy or because education leads to an expanded arena of discretionary activity and social choices).

With respect to *fertility*, it has been suggested that expanding education may be the best policy measure available to achieve a reduction in the fertility rates of developing countries. Female literacy almost always depresses fertility rates although there are significant intercountry variations on the patterns through which this outcome is achieved. The impact is most pronounced when females are enrolled in grade seven and above (Carnoy, 1992).

The mechanisms through which female education exerts influence on fertility are multiple. Women with more education tend to postpone marriage. In Africa, for example, educated women marry up to five years later than their uneducated counterparts while in Latin America and Asia the difference is about three years. When marriage is deferred, the span of a woman's childbearing years is shortened. The result is often a declining birthrate (Schultz, 1989a).

It is not only the age at marriage, however, that influences fertility behaviors. Women with more education also have fewer children as they acquire the skills and knowledge to prevent unwanted pregnancies (World Bank 1980; Schultz, 1989a; Rozenzweig, 1985; Rozenzweig and Schultz, 1987), although these effects vary by region. A comparison study (Schultz, 1989a) between women with seven or more years of school versus women with no schooling showed that the differences are greatest in Latin America (3.6 fewer children) followed by Asia (3.0 fewer children) and Africa (2.0 fewer children).

Literacy leads to greater rates of female labor force participation and greater knowledge about family planning. Education, through the entry it provides into both the formal and informal wage sectors, also reduces a family's dependence on children as future income sources. Thus, the need for large families is, over time, diminished.

To be sure, in some cases women's education is *positively* associated with family size. African women with one to three years of school actually have more children than those with no education at all. Other studies indicate that in geographic regions *where illiteracy is under 40 percent*, education has a positive impact on fertility and more children are born. One possible explanation for this phenomenon is that an educated woman becomes more aware of her health and takes better care of her body. She is thus more likely to conceive. In areas where contraception is not widely available, more educated women may conceive more frequently (Easterlin, 1975).

When *the literacy rate is above 80 percent*, however, education has a negative impact on fertility and fewer children are born (Cochrane, 1979). In general, evidence suggests that while educating girls can reduce birth rates dramatically, there is no statistically significant effect on fertility when boys become educated (King and Hill, 1993).

Econometric analyses suggest that an extra year of schooling reduces female fertility by approximately 10 percent. "Thus, a $40,000 investment in educating 1,000 women in Pakistan would avert 660 births. A typical family-planning evaluation concludes that costs run approximately $65 for each birth averted, or $43,000 for 660 births" (Summers, 1992). Viewed in this light, the education of girls represents a savings over more conventional family-planning interventions.

The contribution of education to *health*, however, extends well beyond the link between schooling and family size. Carnoy (1992) neatly captures both the intra- and intergenerational dimensions of this broader set of relationships:

> *When parents have basic education they are much more likely to provide better nutrition for their children. Women with basic education are also more likely to attend to their own nutrition during pregnancy, giving a healthier start to their infants and reducing the chance of mental retardation. Higher parent education also improves the nutrition children get after they are born, both because parents with more schooling earn higher income and so can afford more food and because more education makes parents more knowledgeable about using different foods to attain better nutrition and health.*

Education affects family health in two ways. First, it leads to higher levels of household earnings. This additional income is used to purchase more healthful food, better housing, and adequate medical care. Second, education prepares individuals to use medical resources more efficiently (Cochrane, *et al.*, 1982). For example, it has been estimated that an additional year of schooling for 1,000 women in Pakistan could prevent the death of four women during childbirth (Summers, 1992).

Maternal education has been shown to affect child mortality more than any other variable including access to health care, cost of health care, or even the amount of money a family spends on health care (Jain, 1985). A study conducted in the Philippines indicated that education was an important factor in enabling mothers to protect their children from unsanitary conditions. In environments where there were poor water and sanitation facilities, educated women were better prepared and more willing to make the required effort to create a healthy environment for themselves and their children (Barrera, 1988a).

Education's impact on child and infant mortality is, in part, a consequence of the nutritional practices of literate mothers. Although educated mothers in Asia, Latin America and Africa breast-feed their children for shorter periods of time (on the average some seven months less), they supplement their children's diet with nutritional and healthful products (King and Hill, 1993). The result of this appropriate supplementation is healthier children (Barrera, 1988a).

The strong relationship between education and health can also be viewed as another facet of the contribution education makes to overall economic development. A recent analysis of economic performance in over 70 countries showed that healthier countries grew faster. Poor countries with a high burden of disease that were able to cut childhood mortality by a modest 15 percent demonstrated a nearly 25 percent increase in their rate of income growth. In addition, health improvements were able to stem productivity losses due to worker illness. A healthier population also uses natural resources more efficiently (USAID, 1994b).

Basic education and equity. Because many of the effects of basic education are intergenerational, the inequities of one generation are visited upon the next. A key factor in the perpetuation of relative disadvantage is the strong correlation

between the educational attainments of parent and child. This pattern has been borne out in many studies (Birdsall, 1980; Lockheed and Verspoor, 1991; Kiras, Mushkin and Billings, 1975). The daughter of a college-educated man in Côte d'Ivoire, for example, was thirty-five times more likely to attend secondary school than the daughter of a man with no education. In Brazil, *maternal* education contributed slightly more to this correlation than did paternal education although both were important (Birdsall, 1980). In Thailand, the education of the father had greater household effects than that of the mother. However, this relationship changed as the quality of maternal education improved (Behrman and Sussangkarn, 1989). In other countries, low literacy rates for women have been intimately linked with low school enrollment rates for girls (UNICEF 1994b; King and Hill, 1993).

Maternal education benefits sons and daughters alike. Research has shown that a man's life expectancy increases as gender parity in schools is achieved. In areas where girls make up less than 42 percent of total enrollment, a man can expect to live four years less than his counterparts who reside in communities where school gender parity is greater (King and Hill, 1993).

A multigenerational study in Peru examined the effects of maternal and paternal education during two periods, 1925–1939 and 1960–1966 (King and Bellew, 1989). The researchers concluded that maternal education was of greater importance for daughters and paternal education more significant for the future of sons. Significantly, the study also concluded that *improvements in school quality inversely affect the importance of parental education in general.* In other words, a lock-step intergenerational cycle of inequity and disadvantage can be reversed through a focus on the teaching-learning process that occurs in the classroom.

Several explanations have been suggested for this strong linkage between the educational attainments of parent and child. Noting the difficulty of achieving even 70 or 80 percent primary school enrollment rates in largely illiterate communities, one researcher suggested the existence of some threshold level of parental literacy as a prerequisite for universal education (Blaug, 1972). Others have claimed that some portion of the earning power of all individuals is due to the educational level of their parents. Better educated parents tend to have children who are more achievement-oriented (Kiras, Mushkin and Billings, 1975).

The well-documented gender gap in basic education enrollment rates and attainment levels thus becomes not only a serious handicap for the girls who never pass through the schoolhouse gate, but for their children as well. It is estimated that more than half (55 percent) of the adult women in the developing world cannot read or write. In comparison, three-quarters of adult men have this skill. This inequitable delivery of educational services is particularly acute in Sub-Saharan Africa, the Arab States and South Asia where two out of three women can neither read nor write (UNICEF, 1994a).

Literacy is intimately linked to strong school completion rates. Not surprisingly, these rates are also weaker for girls than they are for boys. In 1990, an average 6-year-old girl living in a developing country could expect to attend school for 8.4 years. This represents an improvement over the 7.3-year expectancy level of just a decade earlier. However, a boy born that same year could anticipate a schooling career of 9.7 years (UNICEF, 1994a).

While *gender* constitutes the most pervasive basis of inequity, *ethnic*, *linguistic* and *racial* background factors are also related to significant differences in educational opportunity and attainment which, in turn, perpetuate relative disadvantage. For example, in rural Peru, 70 percent of Quechua speakers over age five have never been to school in contrast to the still very high 40 percent of their non-indigenous compatriots (World Bank, 1994a).

Another background factor that should be highlighted in any discussion of the intergenerational perpetuation of inequity is *rural origin*. Data indicate that within developing countries there is a high degree of variance in student performance. This variance is greater than what is typically encountered in developed countries and can largely be explained by the disparities between rural and urban schools. An important implication of this variance analysis is that greater attention needs to be given to the qualitative dimension of basic education. Creating the conditions under which all children enroll in school and learn must be seen as the strategy of choice for achieving equity as well as for improving efficiency.

Thus far, our analysis of the relationship between basic education and equity has focused on the *intergenerational dimension* of this issue as it plays out in matters of educational

attainment, health, and nutrition. There are several studies, however, that directly assess the degree to which education contributes to *income distribution*, another important aspect of equity.

While education may assist in the redistribution of income, the relationship between attainment and earnings is highly complex. Education alone appears to be insufficient as a distributive measure (Woodhall, 1981). Although education is found to have little effect on urban poverty, it is linked to more equitable distribution of income in rural areas. This is particularly true for the bottom and middle-income ranges, with the middle 40 percent of the population benefitting the most from primary education (Psacharopoulos, 1991a).

Recent studies of economic growth and income distribution find that an increase in the number of educated workers is linked to decreased earnings differentials between schooled and unschooled laborers (Davis, 1992; McMahon and Beodiono, 1992; Psacharopoulos, 1989). Education can figure as the dominant determinant of overall earnings differentials among indigenous groups and between monolingual and bilingual workers (Psacharopoulos and Patrinos, 1993). In general, the research suggests that primary education contributes to decreased income differentials between the lower- and higher-income groups (Verba, Nie and Kim, 1978; Psacharopoulos, 1991a; 1993). While the mechanisms through which this occurs are not fully understood, the pattern may be a function of education's potency as a vehicle to both *enskill* and *empower*. In its enskilling mode, education makes workers more productive. In its empowering mode, it increases the political bargaining power of lower-income groups and thus helps make government policies more responsive to their needs.

Inputs that enhance basic education's contribution to human capacity development

Until now we have been examining how basic education contributes to human capacity development. The effects we have dwelt upon have been intimately tied to the four participation domains of partagogy: promoting family development, earning a livelihood, participating in civic affairs or community development, and exercising responsible environmental stewardship. The time has come to turn our attention to the next issue: How can the contributions of basic education to human capacity development be maximized? In order to respond to this question, we will begin by reviewing what is known about how some key *basic education inputs* influence outcomes.

The key finding emerging from a rich body of literature is that *inputs can have a positive effect on learning and achievement in developing countries*. Furthermore, a wide variety of interventions can yield such positive impact. These include class and school size; the use of teaching tools such as textbooks, readers, exercise books and teacher guides; school libraries and other facilities; and child nutrition and feeding programs. Expenditure per pupil is also closely linked to positive impact in developing countries (Kraft, 1994; Fuller and Clarke, 1994).

Teacher characteristics, pedagogical approaches, or classroom orientations also contribute to pupil success. These include pre- and in-service teacher education; teacher subject knowledge or language experience; teacher experience; teacher social class; and class preparation time. Instructional time, frequent monitoring of pupil performance and the frequency of homework are also powerful determinants of learning outcomes (Kraft, 1994; Fuller and Clarke, 1994).

In addition to those inputs that relate intimately to the teaching-learning process, changes in school management and orientation are also linked to school quality. In some developing countries, a rainproof building and a desk to write on have also been shown to be important inputs associated with educational quality (Kraft, 1994; Fuller and Clarke, 1994).

As one might well expect from a list this broad, some interventions are decidedly more powerful than others. Instructional time, cited in 15 of the 17 studies under review, appeared to be the most significant input for improvements in educational quality. Other robust interventions included textbooks; libraries; and frequency of homework (Kraft, 1994; Fuller and Clarke, 1994).

Contrary to conventional wisdom on the subject, class size does not appear to be a major determinant of student achievement. There are, however, caveats to this observation. The influence of class size is relatively modest when the group is between 20 and 40 students. Nevertheless, when the number falls below 20, achievement can be greatly improved. Conversely, when the number rises above 40, there is a significant adverse impact on achievement. This is especially the case in the early primary grades (Kraft, 1994).

Other studies have produced similar, although not identical conclusions concerning the relative importance of basic education inputs. Differences in findings, where present, stem not only from methodological variations, but also from marked differences in sample selection. Many of these "effects studies" drew their samples from US schools or from a mix of developing and developed country experiences.

In one investigation that looked at US schools, good curricular materials were shown to have a profound effect on student learning. This was particularly true when the introduction of such resources was coupled with an improvement in classroom management (Wang, Haertel and Walberg, 1993). The researchers found that consistency of goals, content, instruction and evaluation promoted student learning.

This analysis also uncovered a positive relationship between the use of metacognitive techniques such as "advance organizers" and student achievement. Indeed, classroom practices were deemed to exert almost as much influence on student learning and academic achievement as student background factors, the single greatest source of influence. This finding, drawn from a mix of US experiences, is consistent with research conducted in developing countries which showed that under some conditions school effects on achievement can be greater than family background influences (Fuller and Heyneman, 1989; Heyneman and Loxley, 1983).

In their rank ordering of the factors that influence student learning, a group of investigators (Wang, Haertel and Walberg, 1993) identified classroom management as the most critical of the variables analyzed. Rounding out the top five factors on the list (in order of importance) were metacognitive teaching; cognitive knowledge (i.e., the level of specific, prior knowledge learners had in the relevant subject areas); home environment and parental support; and student-teacher interactions. This analysis was based on a review of several thousand studies done by primary researchers. However, the omission of health and nutritional status as background factors suggests that these findings, while highly significant, cannot be viewed as definitive.

In contrast, Lockheed and Verspoor (1991) did include health and nutrition in their analysis of critical inputs to basic education in developing countries. They concluded

that the five most crucial interventions are changes in curriculum; provision of learning materials; instructional time; classroom teaching styles; and the capacity of students to learn (a reflection of their health and nutritional status). These interventions were selected because of their demonstrated impact on learning, their cost-effectiveness, and the relative ease with which changes in these areas can be made.

Our discussion in Chapter 2 highlighted the importance of socially constructed meanings in the context of learning for problem solving and knowledge transfer. The implications of this discussion are that curricular materials, *per se*, cannot stand alone as the sole component of a strategy to improve student learning. Changes that enable the *culture of the classroom* to support knowledge construction must also be incorporated into a strategy for qualitative improvement. Fuller and Clarke's 1994 review of educational research in Asia, Africa, Latin America and the Middle East confirms what our theoretical discussion suggests.

The authors describe two kinds of educational reformers, *policy mechanics* and *classroom culturalists*. The former operate from the premise that it is possible to "plug in" the optimum number of hours, the best textbooks, or the ideal pedagogies, regardless of the classroom, school or cultural environment in which learning is to take place. In contrast, the latter focus their attention on the socialization of children, the rules of participation and authority, linguistic norms, an orientation toward achievement, and conceptions of merit and status. The authors argue persuasively that it is the "culturally constructed meanings" attached to instructional tools and pedagogy that sustain this socialization process rather than the material character of the school inputs *per se*.

Our earlier discussion of socio-constructivist theory is also highly relevant in interpreting another finding drawn from studies on student achievement in developing countries. International curriculum researchers have found that teacher expectations for student achievement in the earliest grades are often inappropriately high. Furthermore, the transitions from one concept to the next have been shown to have very few intermediate steps (Kraft, 1994). This makes it difficult to achieve a graduated progression of concepts that supports a child's learning.

Such a finding suggests a mismatch between schools and the children they are receiving. Schools appear to have insufficient capacity to incorporate and build upon a child's previous experience. Because new knowledge is constructed in social settings from existing knowledge (the essence of socio-constructivism), one inference that can be drawn from this finding concerns the need to give greater attention to curricular inputs and teaching styles that move children from the known to the unknown in terms of language, patterns of relationships, abilities and knowledge.

This mismatch between schools and their pupils is exacerbated by the vast majority of curriculum efforts around the world that have concentrated on integrating or separating the courses to be taught and adding or deleting hours from the recommended class schedule. Few such efforts have included the preparation of coherent, carefully paced and sequenced instructional programs. Even rarer are those reforms that have provided sufficient materials to help teachers implement new curricula. Compounding this difficulty is the fact that curricular reforms often arrive at teacher training colleges long after they have been introduced into the schools. This asynchronism perpetuates old behaviors long after the change process has begun (Kraft, 1994).

The discussion thus far has been exclusively focused on inputs to basic education that have been shown to contribute to quality and achievement for *the general population of learners*. In light of the significant gender gap as well as the social and economic benefits linked to maternal education, some special mention must be made of those inputs that expand the educational attainment and achievement of girls.

Again, the range of effective interventions for which supporting research exists is broad. For example, girls' enrollment, completion and achievement rates generally improve in the presence of a female teacher (UNESCO, 1993). Other inputs include the provision of separate toilet and water supply for girls, the construction, in some cultures, of single-sex schools, the introduction of appropriate, relevant curricula, and the siting of schools closer to communities so that girls will not have to travel long distances to study. Measures to lower both real and opportunity costs to parents through the provision of such inputs as textbooks and uniforms that would otherwise have to be purchased, also

help to narrow the gender gap. Curricular approaches that are flexible and individualized are also particularly effective because they can accommodate the needs of a girl whose attendance may be irregular because of home obligations (UNICEF, 1992).

Changes in school management and orientation are also linked to improved educational opportunities for girls. In particular, localization and decentralization have an impact on a community's level of support for its schools and the willingness of parents to enroll their children (UNICEF, 1992).

School feeding is also a promising intervention for reducing the educational attainment gender gap (Levinger, 1986; Davison, 1995). Well-designed programs can help defray the relatively high opportunity costs of educating girls. In Tamil Nadu (India), for example, a lunch intervention was particularly successful in narrowing the school attendance differential between boys and girls and in stemming girls' attrition. This program also had a similar compensatory impact on other traditionally bypassed groups, including rural and low-caste children (Kajan and Jayakumar, 1992). In cultures where girls are fed last and least, feeding can also help to enhance girls' Active Learning Capacity by alleviating their short-term hunger and addressing the obstacles to learning that are linked to protein-energy malnutrition and micronutrient deficiency disorders (Levinger, 1994).

Indeed, nutritional supplementation, health screening, clinic referrals, and deworming represent intervention packages that can improve the Active Learning Capacity of all educationally vulnerable children. So, too, can the alleviation of short-term hunger (generally a consequence of poor dietary habits and poverty rather than famine or food scarcity). A growing number of studies suggests that malnutrition and poor health constitute significant educational risk factors for millions of children in developing countries (Levinger, 1994).

Having reviewed the literature on basic education's impact and the inputs needed to achieve these potential effects, we are now ready to move to the heart of our discussion. What policies and measures can further enhance the contribution of basic education to human capacity development? To respond to this question, we will return to our consideration of partagogy.

Basic education research findings: implications for the practice of partagogy

Almost a quarter of a century ago, a prominent economist, while attempting to explain the universal association between education and earnings across sectors, industries and occupational categories, noted the following:

> *. . . the better educated are generally more flexible and more motivated, adapt themselves more easily to changing circumstances, benefit more from work experience and training, act with greater initiative in problem-solving situations, assume supervisory responsibility more quickly, and, in short, are more productive than the less educated* ***even when their education has taught them no specific skills*** *[emphasis added].* (Blaug, 1972)

These words were penned in a simpler time before we had entered, in Heterick's phrase, *the continuing age of the future.* What distinguishes our era from earlier periods is the need that today's ordinary citizen has to unstintingly acquire more knowledge, develop higher-order abstract reasoning ability, and apply more creative intelligence to everyday tasks. At the heart of these new demands is an indisputable truth: *the profusion of information technologies and globalization of the world's economy will continually thrust ordinary workers, citizens, and parents into unfamiliar problem-solving arenas.* The education of tomorrow needs to equip learners with *domain-specific* tools and techniques for responding to the ongoing challenge of novel situations. In short, the seemingly automatic flow of benefits from basic education depicted by Blaug belongs to a bygone era. The question before us now is how to restructure basic education so as to respond to a world that itself is undergoing restructuring.

More specifically, we must react to the absolute imperative of *infusing quality into basic education.* This involves a willingness to confront the tensions that may exist between the goals embodied in the Jomtien Declaration on Education for All and a greater emphasis on higher-order thinking, new applications of educational technology, and closer ties between schools and the labor market.

Bolstered by diverse experiences in developing countries and a growing appreciation of cognitive science research, a consensus must be forged around the need to reconceptualize education. A re-examination of every dimension of education—its role in society, its content, its mission, and the ways in which citizens partake of it—is fundamental to this

process. Underlying such efforts must be a fierce commitment to wrestling with four vectors of change that, at various velocities, are redefining life in the world's cities and towns:

- The skills and knowledge citizens require to raise a family, protect the environment, participate in the life of a community or nation, and earn a living are in a period of significant flux.

- The context in which learning takes place is rapidly changing. Schools, work sites, community-based institutions, and the home are all increasingly viewed as important venues for gaining skills, attitudes, and knowledge. Traditional boundaries between nation states, disciplines, and agendas are in the process of being redefined.

- The technologies available and in use for disseminating knowledge and imparting skills are changing markedly. Of profound importance is the fact that technologies are being introduced which allow learners to solve problems of their own creation.

- There is a good deal of new insight about how individuals learn. We understand, as never before, that learners require the opportunity to construct their own knowledge. We are also beginning to understand how to structure learning, education, and schooling so that this is possible for *all* learners to learn. Implicit in such understanding is a recognition of the importance of *customizing* teaching-learning strategies to meet learners' needs.

The following proposals represent a minimalist campaign platform for the partagogical reinvention of education throughout the developing world. The proposals are framed with a view toward reflecting the research findings and trends summarized in this chapter.

1. *Make equity and quality linked issues and build consensus for strategies that address them in tandem.*

Quality needs to be recast both as an equity issue and as a vehicle in its own right for promoting human capacity development. The research corroborates such a recasting. When quality is high, for example, the importance of parental education as a determinant of a child's educational

achievement wanes. In contrast, rel. tive disadvantage is likely to be perpetuated when quality is low.

A partagogical redefinition of equity may also help to enlarge the quality constituency. In partagogical terms, *equity refers to the patterns by which individuals access existing participation opportunities or create new ones.* In equitable societies, factors such as gender, income, social class, ethnicity, and place of residence no longer skew in large measure the degree to which individuals participate in livelihood activities, promote family development, involve themselves in civic affairs, or protect the environment. When equity is described in these terms, educational quality is intimately linked to the most cherished ideals of a democratic society and the aspirations of its citizenry.

Linking quality and equity, of course, implies that efforts to improve quality will be directed on a priority basis to those groups that have been traditionally short-changed by schooling. Girls, the rural poor, and linguistic or ethnic minorities should be especially targeted by quality campaigns. Furthermore, measures that have had demonstrable impact in closing the gender gap (e.g., the presence of female teachers, separate latrine facilities, flexible schedules, school feeding) should be taken in conjunction with quality-oriented reforms. While quality is a vehicle for achieving equity, it must be complemented by other strategies that address the very specific requirements of traditionally bypassed and disadvantaged populations.

2. *Achieve consensus on the elements that comprise "quality."*

At a minimum, quality-related efforts should probably focus on five very specific characteristics of schooling:

- A *minimum level of instructional time* that allows students adequate opportunity to reinforce prior knowledge and construct new knowledge. Once a target has been established, local authorities and community members will have to work together to ensure that the standard is met.

- *A minimum standard for the instructional materials and resources* that should be available to every child enrolled in basic education. This standard should refer to the qualitative *and* quantitative dimensions of such

materials. From the qualitative perspective, key considerations must include the degree to which resources help children acquire domain-specific content, construct new knowledge, and develop metacognitive skills. Such materials need not be manufactured or purchased. Often the environment will furnish leaves, rocks, and many other items than can be manipulated in ways that spectacularly enrich learning.

- *An articulated, comprehensive plan for training teachers to use such materials and resources* in a manner that is consistent with socio-constructivist practice. Such training would include techniques for engaging students in small-group projects through which new knowledge could be constructed. Training would also give teachers guidance in new ways to evaluate student learning. Teachers would be helped, through their own structured observations and small group work, to develop a keener awareness of the stages children must transit as they move from novice to expert in a multiplicity of skill areas. Finally, training would enable participating teachers to deepen their own knowledge of specific subject matter and to cultivate the metacognitive skills to facilitate their own learning.

- *A standard for average class size* that initially might be cast as a goal to be achieved within a specified time frame. Optimally, this goal should be to reduce class size to 40 in the lower grades where children are most vulnerable to repetition, failure, and attrition.

- *A set of "readiness" criteria* that constitute guidelines by which teachers and community members can assess the degree to which a school is sufficiently prepared to meet the needs of the children it serves. Such criteria would emphasize the degree to which schools enable children to build on prior knowledge, the degree to which schools address learner linguistic and social needs, and the degree to which schools respond to a variety of impediments to learning—including the health, nutrition and hunger of children. In summary, then, these criteria would help schools give greater attention to the curricular inputs and teaching styles that allow children to move from the known to the unknown in terms of language, patterns of relationships, abilities and knowledge.

3. *Promote community-based schools.*

Such schools, regardless of their funding or administrative arrangements, would have a threefold mission: (a) create deep, meaningful connections between the community (parents and employers, in particular) and learners; (b) root what is taught in the reality of the community so that children could readily move from the known to the unknown in their own learning; and (c) meet the learning needs of adult learners in order to create the support enthusiasm and threshold literacy levels that contribute to basic education goals.

Implicit in such community-school partnerships are new and expanded opportunities to immerse students in rich learning environments where they can engage in real-world tasks and performance-based assessments. Both parents and employers can become intimately involved in the creation of authentic tasks for young learners. Even more important in terms of its implications for long-term development is the role that parents and employers can play in helping children move from intelligent novices to experts as they complete such tasks.

4. *Systematically change the culture of the classroom.*

This can be accomplished through the creation of teacher-support networks, training for school supervisors, and outreach to pre-service institutions. All teacher training should mirror the socio-constructivist orientation that will be introduced to young learners. Such methodological congruence between the teacher-training approach and classroom practice is critical in achieving a cultural transformation. Accordingly, teachers themselves should have the chance to develop new skills under the guidance of a training facilitator before they attempt to take on a learning facilitator role themselves.

Changes in the classroom culture can also be encouraged and sustained when teachers who successfully meet quality standards and embody attributes of the new system are recognized and rewarded. Rewards need not be financial. Rather, they can include special opportunities for teachers to share their successes with peers, as well as visits from supervisors or government officials.

In rural settings, especially where teachers are isolated, classroom cultural change will require the establishment of peer support networks. Typically, such networks might enable teachers to meet monthly and allow participants the chance to share personal experiences with the implementation of agreed upon innovations. Network members thus assist one another in refining innovations so that they can be successfully adapted. Through the expression of mutual support for change, networking enables teachers to sustain interest in and commitment to the "reinvention" process.

5. *Assess the extent to which health, hunger and nutrition constitute barriers to basic education and develop systematic plans for resolving these issues.*

Many health and nutrition problems constitute cognitively handicapping conditions. It is inconsistent with an overall goal of developing higher-order skills among basic education students to allow such impediments to go unattended. School snacks, deworming programs, clinic referrals, micronutrient supplementation, environmental sanitation measures, and nutrition education represent a partial listing of the interventions that have had demonstrated impact in removing such obstacles to a child's Active Learning Capacity.

In conclusion, basic education is a key participation opportunity. In varying degrees there are causal linkages between this level of schooling and each of the other participation opportunities with which human capacity development concerns itself. Basic education both *enskills* and *empowers*. Its *enskilling function* helps workers become productive and more likely to enter or remain in the labor force. Parents are better able to raise healthy families. Citizens acquire the skills and motivation to engage in conservation techniques that promote sustainable development. The *empowering function* of basic education is witnessed when low-income groups gain a political voice, make themselves heard and secure the advent of policies, programs and legislation that are responsive to their needs. A partagogical approach to basic education enhances this benefit flow as students develop the higher-order skills and problem-solving abilities they need for an increasingly information-rich era.

Participation for Livelihood

Of a world labor force of 2.8 billion people, an estimated 30 percent are not productively employed. More than 120 million people are registered as unemployed in the world. They are people who seek and are available for work, but cannot find it, not even for one hour per week. Many more—estimated at around 700 million people—are underemployed. They are the working poor. Many of them work for long hours, but since the productivity of their work is low, many do not earn enough to lift themselves out of poverty. They form the bulk of the estimated 1.1 billion absolute poor in the world. Given the increasing influx of new entrants into the labor market, the employment challenge will rise further in the years to come.

—1993 Report of the Expert Group on the Expansion of Productive Employment for the 1995 World Summit for Social Development

Introduction

It seems odd to think of basic education as a prelude to the world of work for most children in poor countries. Indeed, in many instances, children are engaged in earning a livelihood if not long before they enter school, then certainly during the entirety of their school careers. Either independently or in the company of others (adults and older children) they perform a wide range of tasks that generate income and sustenance for their families: weeding, planting, harvesting, fishing, grazing, collecting fuel and fodder, hawking, vending, marketing, herding, transporting goods, caring for livestock, and manufacturing handicrafts. Why, then, introduce "earning a living" as a lifespan juncture when in fact it represents the one enduring constant in the lives of the impoverished, regardless of age?

The answer lies in policy goals and social expectations. "Education for all," is more than a slogan. It reflects a consensus within the world community that, during certain years of children's lives, they should be *primarily* occupied with the task of learning. Indeed, this is seen as a policy goal in virtually all countries. In contrast, expectations shift once basic education has been completed. Then, *productive, sustainable livelihood* becomes the vehicle which provides individuals with their place in society. People who are productively engaged in securing a livelihood make a

contribution to the well-being of their communities and nations. In return, they receive benefits (in cash as well as in kind) that allow them to widen opportunities for themselves and their families.

Thus far, we have spoken of *livelihood* rather than *employment*. This word choice is deliberate. Livelihood, not surprisingly, describes how individuals gain a living. Certainly, employment can provide a livelihood. Most livelihoods of the poor, however, are based on *multiple* activities that, collectively, yield income, food and security (Chambers, 1994). *Livelihood* conveys activities that occur in both the informal and formal sectors. Full employment may be out of reach for many, but even the very impoverished use skills and strategies (which can sometimes be strengthened) to earn a livelihood. Consequently, in this book, employment is viewed as an important subset of livelihood activity but not as the sole means by which people earn a living. Current trends corroborate this assertion.

High levels of unemployment and underemployment are endemic throughout the developing world. The reasons offered to explain the phenomenon are the same as those used to explain why such countries are not yet developed: lack of capital, lack of education and training, weak institutions, and an inappropriate policy environment (Bowles, 1988). A quick tour of major world regions shows that while there are some differences in employment trends, the overall picture is not comforting. There is insufficient stable employment to generate universal livelihood in many of the developing world's communities.

Latin America and the *Caribbean* face an unprecedented challenge. A rapid growth in the working age population, rising labor force participation by women, and a continuing shift from rural to urban employment all contribute to volatility. At the same time, many of these debt-strapped nations have had to retrench from earlier levels of public sector employment. Most newly created jobs are in the informal sector where they are unregulated and uncounted (International Labour Office, 1994).

In *sub-Saharan Africa*, almost three-quarters of the population is rural and the numbers are growing rapidly (except in those areas where AIDS has reached epidemic proportions). While job creation and employment statistics are not very reliable, existing data suggest that more than half of all

non-farm employees work for the state. These governments are, for the most part, in financially precarious positions. The process of structural adjustment has not contributed to increases in employment levels nor to a lessening of absolute poverty in the region (International Labour Office, 1994).

South Asia, a region entirely comprised of low-income countries, also needs to create huge numbers of jobs. Women and young people of both sexes are entering the labor force in unprecedented numbers. At the same time, there has been a rapid flow of labor from farming into urban areas. Labor markets are in substantial flux.

These trends underscore an important dilemma for livelihood earners: achieving a satisfactory balance between *risk* and *security*. On the one hand, globalization of the world's economy is altering modes of production. The pressure to adapt national economies to world markets is mounting. Enterprises find themselves responding to evolving competitive conditions both globally and nationally by changing product lines, production techniques and labor force practices. For some fortunate individuals these conditions spell new opportunities and a higher standard of living. For many others, however, they are harbingers of upheaval and increasing marginalization. The only sensible strategic choice for earning a livelihood is to hunker down, entrench oneself, and prepare to weather the storm.

Flexibility and *collaborativeness* may well be the twin characteristics that bridge the gap between *risk* and *security*. *Flexible* workers, whether employees or livelihood seekers, accept that a lifetime spent performing the same or related activities is increasingly becoming a phenomenon of some bygone era. *Collaborative* workers are able to revise their perspectives on individual roles and responsibilities so that they can acquire the new knowledge and abilities needed to function effectively in settings that are ambiguous, subject to constant change, and relatively unstructured (Creth, 1995).

There are many implications associated with placing a premium on flexibility and collaboration. Education and training must change. New government policies that facilitate an individual's adaptation and mobility while offering social protection during times of transition are also needed. So, too, is a commitment to foster lifelong learning for all citizens that is matched, in turn, by investment to create the infrastructure needed to convert such a vision into reality.

Livelihood through the generation of employment

It has long been recognized that policy is the cornerstone of all efforts to generate livelihood through the creation or expansion of employment. Among the policies deemed to be particularly crucial are those that promote sustainable growth in effective demand; macroeconomic stability with high levels of employment and distributive justice; an efficiently functioning labor market; and an overall system of incentives free of distortions. Experience has also shown that countries which link economic policies to human resource and employment policies also have relatively greater success in promoting employment than nations that have not focused attention on these factors (International Labour Office, 1994).

In general, when a concern for employment is fused with the broader issue of poverty reduction, two other policy elements receive special attention. First, broadly based economic growth is viewed as a prerequisite for the efficient generation of income-earning opportunities for the poor. Second, improved access to education, health care and related social services is understood to represent important features of an employment-enabling environment. The value of these services lies in the contribution they make in helping impoverished people use their most abundant resource: their labor (World Bank, 1994c; Bowles, 1988).

Policy choices always involve trade-offs, and the field of employment generation is no exception. For example, macroeconomic stability is viewed as a precondition for growth. However, stability may not ensure the expansion of employment nor the sustained and equitable growth of income. Similarly, a stable, non-inflationary currency along with high rates of savings and investment are also viewed as essential conditions for sustainable growth. But the same high interest rates that encourage savings occasionally act as a disincentive to investment.

Despite such vexingly difficult decisions, enough is known about the policy requirements for employment expansion so that one group of experts was able to note that, "Where the unemployment crisis exists, it has been created not by chance but by error; by incentives that distort and institutions that are inadequate. For example, national policies . . . [that were] devised to promote capital investment, when labor-intensive production was what the country needed" (International Labour Office, 1994).

Labor market policy deals with a subset of the broader employment policy questions. Here, too, there is an emerging consensus regarding those public and private sector strategies most conducive to employment expansion. Particular emphasis is given to training, retraining, vocational guidance, job counseling and placement services. Significantly, attention is also directed to the promotion of entrepreneurship among livelihood earners through training, credit, and technical assistance (Panton, 1993).

Research strongly suggests that active labor market policies are far more effective when there is a high level of coordination by the key actors involved. Training mismatches, for example, are less likely to occur if there is consultation and articulation among employers, education institutions and public employment services (Expert Group on the Expansion of Productive Employment, 1993).

From this brief discussion of policies related to employment expansion, it might readily be inferred that successful projects to create jobs can reflect very diverse designs. Indeed, USAID's employment-stimulation project portfolio includes activities that focus on vocational education, labor-intensive infrastructure, food for work, export promotion, small-scale enterprise development, and technical assistance. In addition, many projects have assigned priority to improvements in the government policy environment that affects employment. Of course, not all such projects have proven to be equally efficacious (Bowles, 1988). Later in this chapter we will examine further those design factors most closely associated with project efficacy.

In the meantime, suffice it to note that employment-centered approaches to the issue of livelihood enhancement represent an important but by no means exclusive avenue for improving the lives of citizens in the developing world. For many of these individuals, employment, in the sense of having an employer, a job, a workplace and a wage is more widespread as a goal to be reached than as a reality of their daily lives. Accompanying such joblessness is another difficulty that, many would argue, is even more severe, underemployment (Bowles, 1988). It is because of the pervasiveness of these two problems—unemployment and underemployment—that attention has begun to shift to the informal sector.

Livelihood in the informal sector

The informal sector encompasses the self-employed, those involved in small-scale production, personal service providers, and small farmers. It is characterized by low-skilled, labor-intensive work (Panton, 1993; Portes, *et al.*, 1989). Oftentimes such work falls beyond the reach of government regulation, taxation, and recognition. Thus, millions of people labor in developing countries from before sunup until after sundown only to be officially considered as either unemployed or underemployed.

Most workers in developing countries find work not in the modern, formal sector but in the informal sector. While some of this informal activity takes place in urban areas, the bulk of it is rural. Current projections confirm that this pattern is likely to persist for the foreseeable future (Panton, 1993; Portes, *et al.*, 1989). Specifically, the agricultural sector is expected to continue providing a livelihood for many citizens of the developing world, 60 percent of whom now live in rural areas. For women, agriculture constitutes their main economic activity (Expert Group on the Expansion of Productive Employment, 1993).

One factor that will determine the level of livelihood for many is the ability of individuals to create opportunities for themselves within the informal sector. As governments' attitudes toward this "shadow economy" become less hostile (as evidenced by increasing investments in training, marketing assistance, special credit facilities, and lax enforcement of certain rules), the pace of growth in the informal sector is expected to accelerate.

It has been observed that employment, unemployment, job, workplace and workforce are all concepts and categories derived from the urban industrial experience of developed countries. As such, their relevance to the lives of the impoverished is limited (Myrdal, cited in Chambers, 1994). Thus, as noted earlier, the term livelihood has been suggested as a better reflection than *employment* of the complex and diverse reality of what has come to be known as the *informal sector.*

Chambers (1994) has proposed the concept of *sustainable livelihood* where *sustainable* refers to the longer-term aspects involved in pursuing activities that enable one to make a living. These distinctions seem useful for they suggest a broader range of approaches to human capacity development than the more narrow focus implicit in employment.

Specifically, this new emphasis allows those concerned with human capacity development to build on the ingenuity and pragmatism of the poor, landless and traditionally bypassed as well as their complex, diverse and risk-prone strategies for survival. The ability to recognize the abundance of strategic acumen that exists among the poor and to harness it as a building block for the development of new skills and knowledge is also a critical element of partagogy.

These views stand in sharp contrast to the standard (neo-classical) economic analysis that shapes the thinking of most official development agencies today. According to that paradigm, the relationship between capital and labor is expressed in a "production function" based on a given technology. Growth is related to *employment* and, barring unusual circumstances (e.g., changes in technology or price rigging in favor of capital), increased growth means increased employment (Bowles, 1988).

The importance of the informal sector to the question of human capacity development can readily be summarized. Any strategy designed to expand opportunities for livelihood must give central importance to the self-employment and entrepreneurship that characterize the sector. An emphasis on agriculture, agro-industry and small firms—understanding the opportunities they present and the skills required by those who would avail themselves of these opportunities—must be a central underpinning of any comprehensive human capacity development approach.

The *rural* informal sector. Many developing countries have the potential to create vigorous agriculture-based economies where most of the work can be undertaken by small businesses, independent operators and other actors in the informal sector. Swaminathan (cited in Anderson, 1995) has identified three different "sectors" of agricultural production. The first relates to actual farming and agro-based industry. It includes cattle and poultry raising as well as agroforestry. The second sector includes those industries that process agricultural products. Again, much of this activity is done by very small-scale entrepreneurs. The third sector refers to the provision of ecologically sound services to agriculturalists. For example, the use of integrated pest management requires a strong services component for the technology to succeed. Such services represent genuine opportunities for the rural poor. Swaminathan envisions a growing industry engaged in the production and sale of

biological software to food producers. Biological fertilizers and bio-pesticides would be major elements of such a product line. It should be noted that literacy and numeracy are essential skills for such activity. Without them, it has been suggested, errors in pesticide and fertilizer application are likely to lead to failure (Schultz, cited in Carnoy, 1992 and Panton, 1993).

What is important about this view of agricultural activity is the recognition that the three sectors are not mutually exclusive. On the contrary, they depend upon one another and can be expanded together, creating not only food and cash income but greater livelihood opportunities. For many, this will be in the form of self-employment. In this conception, agriculture is not only a source of food production, but also "an engine for economic growth and development" (Swaminathan, cited in Anderson, 1995).

In focusing on the current *cultivation* patterns that predominate in developing countries, Chambers (1994) also uses a three-tiered scheme. *First* (or industrial) *agriculture* is simple and practices are highly standardized. In contrast, *second* or green revolution cultivation is associated with high-yielding technical packages that can be applied in highly controlled conditions. *Third agriculture* is best described as complex, diverse and risk-prone (CDR). It is this form that predominates in most rural communities and through which perhaps as many as 1.5 billion people earn a livelihood.

The strategy of CDR producers is to reduce risk and maximize both food and income by diversifying and, where labor is available, intensifying their farming systems. They multiply internal links and flows within farming systems through a variety of practices including aquaculture, composting, multiple cropping, agroforestry, home gardening, and the concentration of nutrients, soil and water in such microenvironments as silt deposition fields and similar pockets of fertility (Chambers, 1994).

According to most estimates, activity in the rural *non-farm sector* can be expected to grow, particularly if measures are taken to upgrade technology, raise productivity, ensure the supply of essential inputs, establish marketing and distribution channels, create links between agriculture and industry, and respond to export-market demand. When farming productivity is enhanced, off-farm economic activity also expands (Anderson, 1995; Ahmed, 1991; Jagannathan, 1987;

Portes *et al.*, 1989; Griffin and Knight, 1990; and Giaoutzi *et al.*, 1988). Already, non-farm activity accounts for a significant and growing proportion of rural employment in Asia, North Africa and the Middle East (Expert Group on the Expansion of Productive Employment, 1993).

Farm and non-farm activities are often practiced by the same individuals according to their needs, resources, the opportunities that present themselves, and an individual's particular strategy for earning a livelihood. Researchers have documented that even within a single village, different social groups of landless poor have completely different strategies for securing food, income, support and survival (Heyer, cited in Chambers, 1994). Some of the elements that may appear in these strategies include mutual help, the mortgaging and selling of assets, casual labor, and seasonal migration. A review of the varied livelihood tasks undertaken by the impoverished over the course of a year suggests that, typically, members of a household engage in many livelihood activities and that most of them do not fit any concept of "employment" or "job." Instead, individuals and families diversify and complexify their livelihood strategies in order to increase income, reduce vulnerability, and improve their quality of life.

The *urban* informal sector. In cities and towns across the developing world, the informal sector is playing an important part in the move toward industrialization. Small informal enterprises help drive this process according to a typical pattern of growth. Household (cottage) activities, such as handicraft production, specialty food preparation, clothing and shoe manufacture, crop processing and smithing are the first level of industrialization. These small enterprises, which are often linked to the agricultural sector, offer livelihood to many workers whose numbers are expected to grow in the future. At the second level of industrialization, larger workshops and factories predominate. They, in turn, are served by a network of informal businesses that are engaged in such activities as forging, machine-shop processing and foundry work. Employment within this informal network may grow even faster than within the factories and workshops to which they are linked (Giaoutzi, *et al.*, 1988; Griffin and Knight, 1990).

In short, as large urban industrial firms expand the number of employees they hire, small and medium-sized enterprises will evolve to support these industries as suppliers,

contractors, or service providers to their workers. Many of the start-up businesses will initially be informal sector ventures that, over time, mature into larger firms. Current labor forecasts suggest that these fledgling operations are likely to grow and expand more rapidly than the large firms that, directly or indirectly, gave rise to them (Giaoutzi, *et al.*, 1988; Griffin and Knight, 1990).

In the past, the urban informal sector was badly hurt by general policies that inhibited new enterprise. Policies that favored import substitution were particularly injurious. Lately, however, this policy measure has been rejected by increasing numbers of developing countries or at least offset by other strategies that reflect an understanding of the vitality and productivity of the informal sector (Bowles, 1988).

From this discussion, it should be clear that the urban informal sector is far from homogeneous. At one extreme are the very large numbers of people who eke out a subsistence living. For them, work in the informal sector represents a survival strategy. At the other end of the spectrum are micro-entrepreneurs and artisans who have demonstrated a capacity to accumulate capital, take advantage of market conditions (even in the midst of adverse economic circumstances) and expand employment.

It has often been suggested that any comprehensive approach to the problems of urban informal sector livelihood must begin with an attempt to address some of the underlying causes of rural-to-urban migration. Specifically, expansion and diversification of rural non-farm activities and employment linkages to the agricultural sector are thought to be critical components of any strategy to improve the lives and livelihoods of both the rural and urban poor (Expert Group on the Expansion of Productive Employment, 1993). Such a viewpoint serves to emphasize the high level of interdependence that exists within the informal sector.

Building skills for sustainable livelihood

Labor conditions, whether in the formal or informal sector, are increasingly becoming characterized by three attributes: *change*, *variety* and *uncertainty*. Given the volatility of conditions, both the employed and self-employed will need to be *flexible* in order to respond to changing market conditions and labor market shifts.

Ingenuity, *initiative*, and *resilience* are also particularly important traits for those who earn their living in the *informal* sector. These attributes enable individuals to detect opportunities, develop appropriate strategies, identify resources, obtain product knowledge, and build relationships. They also are closely tied to the ability to improvise in response to changing market conditions by changing the product or service sold; the ability to readily apply new production techniques as market conditions alter; and the ability to engage in risk taking and experimentation through trial and error (Wagner, 1993; Expert Group on the Expansion of Productive Employment, 1993; Berryman and Bailey, 1992; Ahmed, 1991; World Bank, 1994a; Griffin and Knight, 1990; Leonor, 1985).

As detailed in Chapter 4, literacy and numeracy are also important skills for formal and informal sector participation because they provide the building blocks for many of the *mental processes* that are inherent in such livelihood activity. These include problem solving, logical reasoning, critical thinking, the establishment of cause-and-effect relationships ("scientific methodology"), the assessment of options, the accumulation and appropriate application of facts, as well as the drawing of inferences that lead to the discovery of new concepts. Literacy also contributes to improved communication in general, and oral expression in particular. Both are essential in customer and service relationships (Wagner, 1993; Expert Group on the Expansion of Productive Employment, 1993; Berryman and Bailey, 1992; Ahmed, 1991; World Bank, 1994a; Griffin and Knight, 1990; Leonor, 1985).

Because so much of informal sector activity involves entrepreneurship, it is also important to examine the positive influence that basic education has upon such behavior. Numeracy and literacy, along with socialization into the process of change and decision making, enhance entrepreneurship. The impact of basic education is heightened when there is access to credit, extension services, appropriate technologies, and other inputs that are vital to the enterprise's success (Haddad, 1990; Carnoy, 1992: Griffin and Knight, 1990).

Traditionally, three major vehicles have been used to equip livelihood seekers with the skills they need to earn a living: *vocational education*, *nonformal education* (with an emphasis on literacy and numeracy) and *extension services*. Each will

be examined briefly to assess respective strengths and weaknesses.

Vocational education. In recent years, vocational education programs have come under sharp attack. The chief criticism leveled against them is that they cannot readily accommodate volatile labor markets and, therefore, too often provide training that, by virtue of its over-specificity, quickly becomes obsolete (Bowles, 1988; Wagner, 1993; Expert Group on the Expansion of Productive Employment, 1993; Berryman and Bailey, 1992; Ahmed, 1991; World Bank, 1994a; Griffin and Knight, 1990; Leonor, 1985). Furthermore, where employment generation has been the goal, evaluations suggest that such programs generally have poor payoffs (Bowles, 1988). Indeed, numerous studies have concluded that vocational training is no more likely to increase employment than general education programs (Psacharopoulos and Loxley, 1985; Foster 1987; Corvalan, 1988; Middleton, *et al.*, 1993).

Evaluations of vocational education projects also suggest that such interventions are often particularly unsuited in responding to women's livelihood needs. This is because most programs do not provide women with the skills they need to become employable. Instead, women are more likely to be taught traditional skills for which, even in a growing economy, demand is limited (Bowles, 1988).

Where vocational education is successful, training is usually addressed not to the general market, but rather to meeting the training needs of specific employers. In turn, of course, this suggests the need for active employer involvement in the training (Bowles, 1988).

Vocational education successes have also been marked by a focus on *labor demand*. Generally, unless there is a clear demand for labor as indicated by both a growing economy and low price distortions, vocational education will probably not be cost-effective. Indeed, training for specific occupations, especially in stagnant economies, yields relatively unsatisfactory returns on investment (Bowles, 1988).

Vocational education projects are also far more likely to succeed in *dynamic* (as opposed to stagnant) economies where there is a rising demand for labor. In such settings, placement assistance need not be a program design feature (Bowles, 1988).

Most successful vocational training programs exhibit flexibility with respect to curriculum and methods of instruction. Some evaluations, in fact, indicate that because low-budget schools are forced to be efficient, versatile and flexible in their approach to training, they are relatively more cost-effective than better financed institutions (Bowles, 1988). Such curricular and methodological flexibility is well suited to programs that strive to assist participants in developing a flexible outlook with respect to their livelihood strategies.

To some observers, this requirement for curricular and methodological flexibility suggests a need to attach vocational training programs to structures outside the normal workings of ministries. When ministries are strongly bureaucratic in orientation, they may hinder program success. In such situations, an autonomous institution governed by representatives of business, labor, and government may offer a more effective means for developing productive workers. Such structures can more readily respond to prevailing market conditions (Bowles, 1988).

Another factor that markedly contributes to the success of vocational education is *post-training follow-up.* Many students are stranded as their skills become obsolete. Where programs exist for "re-skilling," the initial investment in worker training need not be lost when technologies change (Psacharopoulos, 1991b). Since many vocational education programs are relatively expensive due to the special equipment needed for implementation, the introduction of "re-skilling" may be an important consideration in designing economically justifiable interventions.

The negative social attitudes toward vocational education programs represent another factor that may thwart program success. Many families regard vocational training as inferior to academic schooling. They therefore avoid such training except as an educational opportunity of last resort or as a springboard to subsequent academic opportunities. Given this situation, it is not surprising that dropout rates in such programs are notoriously high. Attrition, however, could probably be reduced through better recruitment and screening of participants (Psacharopoulos, 1991b).

Finally, vocational education is hampered by inadequate teacher training which contributes to the low quality of many programs. When teachers' skills are market-competi-

tive, the salaries that they can command are beyond the reach of the public sector. Offering teachers competitive salaries may well drive up program quality, but the cost increase often means that such training is no longer affordable to participants or the entities that sponsor them.

Nonformal education. As we have seen, a strong case can be made against formal vocational schooling because of the external inefficiencies associated with it. Limited relationships with employers, inadequate staff, outmoded equipment, inappropriate curriculum and relatively high per capita costs are all factors that contribute to its inefficiency. Latin American data indicate instruction in industrial institutes and vocational secondary schools is less cost-effective than more informal training (Metcalf, cited in Bowles, 1988). Investigations also suggest that there may be substitutability between basic education (with its emphasis on literacy and numeracy) and formal institutional vocational training (Bowles, 1988). In the wake of these findings and a variety of implementation problems associated with vocational education, the World Bank, in 1992, revised its policies in favor of support for basic education (Foster, 1992).

A countervailing trend is the rise in the number of livelihood-centered *nonformal education* programs (i.e. non-certificated training, often with relatively flexible entrance requirements, offered outside the rules and regulations of ministries). Often such programs seek to develop skills in literacy, numeracy, group solidarity, and specific production-oriented technologies. Foster (1992) argues that these general skills can, themselves, be seen as a form of vocational training as they increase an individual's prospects for income and social mobility.

Nonformal education has been shown to be a cost-effective approach for enabling farmers to allocate resources in a cost-efficient manner, reach informed decisions about inputs, control proportions of outputs, and make sound technology selection decisions (Jamison and Moock, cited in Griffin and Knight, 1990). Such programs can also help learners develop receptivity to new ideas, self-confidence and a willingness to innovate.

Particularly well suited to collaborative modes of learning, nonformal education is also an effective approach for developing a sense of community among program participants.

Ideally, learners work together to create or process knowledge that is, in large measure, derived from community-based practice and experience. The environment in which such growth occurs is unthreatening and democratic. Learners feel free to exchange ideas and share experiences. Mutual respect for the ideas and opinions of others is encouraged. Emphasis is placed on encour..ging learners to listen to and respect different points of view, to engage in discussion, and to develop a sense of commitment and responsibility to the group.

Nonformal education conveys advantages beyond its suitability as a methodology conducive to the promotion of collaboration. Its flexibility also makes it ideal for facilitating worker adaptation to rapid changes in the economy. Such adaptation, according to the literature, is best promoted through retraining, job counseling, mobility assistance, and placement services. Nonformal programs can incorporate each of these features. Of course, such measures can only achieve the desired impact when the labor market policy environment is supportive (Expert Group on the Expansion of Productive Employment, 1993).

Michael Schrage, in his book *Shared Minds: The New Technologies of Collaboration* (1990), explores the similarities and differences among communication, cooperation and collaboration. He is particularly interested in how *diffusion of information*, one of the two trends that undergird partagogy's conceptual orientation, influences collaboration. His thesis is that information proliferation offers a unique opportunity for both individuals and organizations—whether conventional manufacturing concerns or solidarity groups from the informal sector—to focus on collaboration. Schrage defines collaboration as an "act of shared creation and/or shared discovery," and he draws a sharp distinction between communication and cooperation. The former is characterized by exchange of information while the latter involves people's working together for a common purpose without having necessarily defined that purpose.

Collaboration involves a unique set of expectations and behaviors. First and foremost, it is a process among equals. Understood as such, collaboration is not appropriate to all situations. Rather, it is suitable where there is *a desire or need to solve a problem* or *discover something within a fixed set of operational constraints*. Seen in this light, collaboration is neither routine nor predictable. It also is markedly different

from communication or even teamwork. What distinguishes it is the creation of *value* it engenders. The extent of this value surpasses what traditional structures of communication can achieve.

While collaboration can be introduced through formal vocational training structures, nonformal education, by virtue of its flexibility and credential-free environment, is far better suited as a vehicle for both teaching and promoting it. As Schrage notes, in order for a collaborative model to work, "the organization structure and culture will need to change from a hierarchical one where decisions flow vertically, top down, to one that is fluid and flexible and focused increasingly on a horizontal approach to decisions and action." Nonformal education fits that bill.

A central thesis of this book is that *livelihood seekers will need to broaden their perspectives on the roles that they play within their work environments—whether formal or informal—so that they can increasingly tolerate conditions that are relatively unstructured, ambiguous, and in a constant state of change.* Knowledge of how to collaborate and under what circumstances to do so represents the intellectual grist for the mill we have labeled *flexibility*. One conclusion, then, that can be drawn from this analysis is that collaboration must become a dominant mode of teaching and learning. This is a task much more readily accomplished through nonformal education programs that are geared to improving livelihood prospects for those with jobs as well as those engaged in sustenance-producing activities. The contribution that collaboration can make to development is nothing less than the removal of barriers—both personal and institutional—that hinder progress across traditional boundaries.

In order to illustrate how nonformal approaches can simultaneously foster collaboration among livelihood seekers and open new avenues of income for program participants, one representative program will be profiled.

Freedom from Hunger, a nongovernmental organization headquartered in California, sponsors programs in Ghana, Mali, Bolivia, Honduras, Thailand and elsewhere that blend credit, nutrition and health services with nonformal education. The target audience is women who suffer from chronic malnutrition, and the program goal is to expand participants' income. Programs operate on the premise that very small loans, when complemented by training, can make a significant difference in the lives of marginalized individuals.

Women interested in receiving loans come together to form a credit association (a solidarity group). Typically, such an association is composed of 20 to 30 members who meet weekly to receive training. The individual loans average $53 and are intended to be invested in an income-generating activity with which the credit association member has some familiarity. Because the loans enable borrowers to build on and expand knowledge they already have, activities tend to focus on raising animals, food processing, and the sale of prepared foods. Activities are chosen so that participants can repay the loan with interest, save a small amount weekly and have adequate resources left over to purchase food and other necessities.

During each weekly meeting, women take part in informal education activities that are focused upon their small-scale economic activities. Additionally, training features discussion of such health issues as birth spacing and timing; infant and child feeding activities; diarrhea prevention and treatment; and the importance of immunizations (Hamilton, 1995).

By addressing these health-related concerns, the program also assists participants in *sustaining* the benefits that accrue to them through the provision of credit. Family health-related emergencies, particularly those involving infants and small children, are often easily preventable (see Chapter 3 for a fuller discussion). When such crises do occur, they often deplete a family's limited savings and jeopardize the success of its livelihood strategy.

Evaluations conducted jointly by USAID and Freedom from Hunger suggest that this model has been successful in raising women's incomes, providing them with new skills, and enhancing the health and nutritional status of participants and their families. There are many other projects conducted by nongovernmental organizations around the world that use an approach similar to the one outlined here and that have also achieved positive results. Some introduce literacy training, as needed, to the skills mix in order to capture many of the benefits that are known to accrue to individuals with this level of knowledge (Bowles, 1988).

When nonformal *livelihood* education programs incorporate literacy and numeracy, learners benefit through improved communication, abstract reasoning, and problem-solving skills. Literacy also lays a foundation for the acquisition of

more narrowly defined skills. Furthermore, literate individuals can more readily renew skills or adapt and change them. The most compelling case for including literacy (where needed) in the nonformal education package is based on a recognition that the instrumentality of these skills is so high that they are, in effect, critical components of vocational knowledge (Foster, 1992).

Related to, but different from literacy and numeracy are lifelong learning skills. Increasingly, these are becoming essential tools for augmenting income and expanding livelihood options. The trends discussed in Chapter 1 of this book suggest that all citizens, whether literate or relatively untutored, are teetering on the brink of obsolescence. The safety line that keeps us from plummeting into the abyss is our capacity to upgrade skills, access new knowledge, master new technologies and create new mental models. Because nonformal education is geared to the *self-defined objectives* of learners, it is well suited to help them develop the lifelong learning skills they need to meet these objectives.

Thus far, we have discussed group-centered approaches to nonformal learning. It should be noted that apprenticeship is, of course, a time-honored variant on the nonformal education theme. There are several major advantages of the apprenticeship model, in which a learner masters a trade by working alongside a skilled and experienced craftsperson. First of all, apprenticeship schemes generally have intimate ties not to the general labor market, but to the requirements of specific employers. As such, they are more cost-effective as a means to help individuals enhance their livelihoods than labor market-centered training programs (Bowles, 1988).

Second, apprenticeships are commonly self-financing. Generally, the learner earns some reduced compensation while advancing toward mastery of a particular craft or trade. The instructor, a current practitioner and employer, receives labor in exchange for the transmission of know-how. Inter-ministerial coordination, bureaucratic infrastructure and cumbersome administration need not be part of the apprenticeship model. Of course, governmental entities can play "brokering" and "certification" roles. As brokers, such entities can help match learner and craftsperson. As "certifiers," governments can offer tax or related incentives to craftspeople who meet certain quality standards for the development of novices.

Third, apprentices are generally solving problems and performing tasks that are firmly rooted in the realities of the context in which future livelihood will be earned. This contributes to the high levels of external efficiency associated with such an approach.

Finally, apprenticeships are naturally regulated by the laws of supply and demand. As such, they are unlikely to produce a glut on the market for specific crafts or trades. Active employer involvement in apprenticeship training serves as a quality control checkpoint with respect to labor-market realities and employer demand for specific skills.

There are, of course, drawbacks to an apprenticeship approach for enhancing livelihood. In economies that are undergoing rapid structural transformation, apprenticeship training may not be sufficient for responding to the demand for skilled labor. In such circumstances, formal vocational training or other kinds of informal skills-building programs may be more attuned to economic realities.

As noted in Chapter 2, the *cognitive apprenticeship* model of learning has begun to influence instructional practice in a number of countries (de Baessa, *et al.*, 1994; Collins, Brown and Holum, 1991). This model is, of course, intended primarily for use with children and is based on more traditional forms of achieving craft mastery. Nevertheless, the steps delineated in the newer paradigm (including modeling, coaching, scaffolding, guided practice, and exploration) can serve to remind those engaged in traditional apprenticeship instruction of the importance of problem solving, reflection, collaboration and discovery in achieving expert status.

Extension work and livelihood development. Generally speaking, extension workers offer technical advice, information, and encouragement (through social promotion) to community members regarding the adoption of new practices. Health, nutrition, population and agricultural production issues are usually the content of such outreach. In the last several years, micro-enterpreneurial activity has also been a focus of extension work.

Extension often includes one or more of the following elements: short courses; demonstrations; on-site (home, farm or enterprise) visits by the extensionist; community fairs and exhibitions; special talks at gatherings of community

members, and social marketing through mass media as well as traditional local means (e.g., storytelling). Often, messages are reinforced through planned communication synergies that involve the use of multiple communication channels. Thus, for example, a radio spot might echo the message of an extensionist's house-to-house visits.

Most often, the goal of extension work is to promote specific *packages of technical practices*. For example, in agriculture, the package might involve the use of fertilizer, pesticide, and certain soil conservation techniques. In the health realm, a commonly disseminated package to reduce infant mortality includes growth monitoring, oral rehydration therapy, the promotion of breast-feeding, and a specified course of immunization.

Increasingly, extensionists are also helping micro-entrepreneurs develop their "enterprises" through technical packages. Typically, these packages place emphasis on business planning, credit management, marketing, product development and basic record keeping.

The advantages of such technical packages are numerous. They enable extensionists to draw upon the best and most current thinking when giving advice to clients. The use of packages also makes it easier for ministries to train and support extensionists. Where inputs are part of the technical package, as is almost always the case, the promotion done by the extension program often results in the creation of enough demand so that normal distribution outlets are willing to stock the products needed for full adoption of the technical package. As noted earlier in this chapter, the creation of demand for the inputs included in widely disseminated technical packages may also lead to the proliferation of new livelihood opportunities for entrepreneurs from the informal sector (e.g. the production of organic fertilizer for bio-intensive gardening).

Sophisticated extension work can help farmers uncover relationships between technology and outputs, especially when there is a long lag time between application and results. Demonstration plots are especially well suited for this purpose. Mastery of this kind of cause-and-effect thinking is directly linked to an individual's willingness to correctly assess and assume risk.

There are, however, drawbacks as well as advantages to extension as a tool for promoting livelihood enrichment. The fundamental shortcoming of a package-oriented approach to extension is its general neglect of broad-based, problem-solving skills, analytical reasoning and group process, particularly in the construction of new knowledge. Furthermore, most extension work is not likely to develop a predisposition toward flexibility and collaboration on the part of clients. Finally, extension generally does not address some of the cognitive and knowledge obstacles that may prevent the successful adoption of technical packages. Specifically, several studies have shown that the use of simple technological inputs such as fertilizer is enhanced by basic literacy and numeracy skills (Figueroa, cited in Griffin and Knight, 1990). More complex technology and machinery require an even higher level of literacy along with some basic scientific knowledge (Ahmed, 1991). To the degree that extension work fails to address these prerequisites for successful adoption of technical packages, its impact will be limited.

Another potential limitation of the extension approach relates to the fashion in which the technical package is identified. In superior programs, the package's origin is *best local practice* which is identified when community members nominate peers and neighbors whose livelihood skills are worthy of emulation. All too often, however, the package's constituent elements are designed by the sponsoring ministry or development organization, and little effort is made to build on local strengths or knowledge.

These limitations can, however, all be readily remedied. Many of the nonformal education techniques described earlier in this chapter, particularly those that relate to collaborative approaches to learning, can easily be adapted for use in extension programs. More attention can also be given to the development of higher-order cognitive and problem-solving skills through greater emphasis on group work for the construction of knowledge. Groups themselves can play an important role in assembling the technical package that is the focus of a particular extension program. Finally, extension programs can be designed with clear linkages to nonformal or vocational education programs that provide appropriate training in literacy, numeracy, critical thinking and problem solving as well as collaborative, flexible approaches to livelihood generation. Such *complementary programming* can preserve the advantage of specificity and

focus inherent in the technical package approach to extension while addressing some of the obstacles that hinder successful adoption.

Health, nutrition, population and the capacity to earn a livelihood

Thus far, we have identified knowledge, skills and attitudes individuals need in order to participate in livelihood activities. We have also reviewed some alternative modalities through which this *intellectual capital* can be created within a nation's pool of livelihood earners. Throughout these discussions, we have also considered policy options that enhance the opportunities enjoyed by citizens to earn a living. However, since this book is concerned with *human capacity development* in its broadest sense, we need to briefly consider three additional factors (beyond skills, attitudes and knowledge) that influence *livelihood capacity*: a worker's health, nutritional status, and reproductive choices.

Adequate nutrition is necessary for effective labor force participation (Meier, 1984; Griffin and Knight, 1990). Indeed, many job functions can be impaired by malnutrition, and the substitution of additional workers does not always compensate for this impairment. In one study, accident and absenteeism rates were shown to decrease when feeding programs were introduced in factories (Griffin and Knight, 1990). In general, adequate nutrition in adults not only contributes to more productive work days and fewer days lost to illness, but also to longer work lives and higher earnings (Del Rosso, 1992).

Nutrition's impact on worker productivity begins during an individual's childhood. Chronically malnourished children become smaller adults. Their reduced physical capacity is a drawback to productivity in many settings.

For workers in the informal sector, health and nutritional status are of critical importance. As Chambers (1994) notes, the poor develop complex strategies for sustenance based on a *portfolio* of livelihood activities. However, a portfolio (and, hence, a livelihood) cannot be sustained if its main asset, the body, is sick, damaged or disabled. Health services for prevention and prompt treatment of accidents and sickness are basic needs if the poor are to achieve sustainable livelihoods.

Demonstrably, health is intimately tied to economic growth which, in turn, is the most important determinant of liveli-

hood opportunities. A recent analysis of economic growth performance in over 70 countries showed that healthier countries grew faster. In poor countries where there was a high burden of disease, measures that cut childhood mortality by 15 percent could increase the rate of income growth by nearly 25 percent. In addition to their impact on worker productivity, health improvements favor growth by permitting the use of natural resources that are otherwise inaccessible because of disease (USAID, 1994b).

Related to health status is the issue of population growth and fertility patterns. A recent review of literature linked population growth to two measures, per capita output growth and per worker productivity. The researchers found that the correlations in the 1980s were significant and quantitatively large. The direction of the linkage, however, varied with a country's level of economic development. In poorer countries the relationship was negative; in contrast, in more industrialized settings, the linkage was sometimes positive (Kelley and Schmidt, 1994).

In general, rapid population growth (i.e., greater than 2 percent) thwarts efforts to raise incomes and improve livelihoods in poor countries (World Bank, 1994d). Research suggests that without declines in fertility, these nations are unlikely to increase the amount of capital per worker to the degree needed to yield significant improvements in productivity, wages and living standards (World Bank, 1994d). However, smaller families are not likely to become the norm in many countries until parents believe that they will be better off with fewer but better nourished, better educated, and better employed children. Thus, effective health services for children and workers must be an important part of any strategy to expand livelihood options and income.

Expanding participation in livelihood activities: implications for the practice of partagogy

Partagogy's methodology and content reflect a research-based identification of factors that *enable* or *inhibit* an individual's entrance into key *participation opportunities*. Perhaps the most essential of these opportunities is earning a livelihood, for it is through work that individuals establish their place within society. What, then, are the conceptual underpinnings of a partagogical approach to expanding participation in livelihood activities?

First and foremost, as we have seen in earlier chapters, partagogy demands *holistic* thinking in terms of program and

policy design. In the case of livelihood participation, this means that existing linkages have to be uncovered and new ones forged. Among the critical linkages to assess and, as needed, bolster are the following:

- the ways in which the formal and informal economies interact with each other;
- the degree to which there is *coordination*, *coherence* and *consistency* among economic, human resource and employment policies as well as the extent to which these policies are supported by (and, in turn, support) policies governing health, nutrition, population and education;
- the degree to which employers, education or training institutions, and government entities coordinate activities to promote the growth of livelihood activities;
- the way in which structured, formal education or training programs interact with and complement apprenticeship, extension, and nonformal education *enskilling* efforts;
- the way in which policies and programs support each other in terms of goals, approaches and priorities.

Another aspect of holistic thinking that is key to partagogy concerns the *array of symbiotic relationships* that govern livelihood participation opportunities. For example, the sets of on-farm and off-farm livelihood opportunities serve to mutually shape each other. Increases in on-farm productivity spur the creation of new off-farm livelihood options. Likewise, a growth in the formal economy engenders new opportunities for informal-sector workers. The quality of life in the countryside interacts with urban lifestyles in ways that shape internal migration patterns, labor-force mobility, and job creation. Partagogy demands that policy makers and program designers describe these interplays with precision—both quantitatively and qualitatively—so that new initiatives can be purposefully designed to prolong *virtuous cycles* and foreshorten *vicious circles*.

A *second* cornerstone of partagogical thinking about livelihood participation is *program focus*. Partagogical programs are *livelihood-* rather than *employment-centered*. This is in keeping with the partagogical tenet of building on what people actually do and know. For some, *livelihood* and *job*

will be synonymous. They are the ones for whom a conventional workplace program and policy focus will be perfectly appropriate. But for many others, it is the informal sector that provides whatever living they may earn.

Partagogy necessitates that we approach the issue of work by questioning the extent to which "livelihood" equals "job." The equivalence—or lack thereof—between the two terms is a program design and policy assumption that must be subject to rigorous empirical testing. In many respects, we have entered the *post-job era*. Among the educated elite, this is seen in the proliferation of self-employed contractors, part-time workers, and career-switchers.

For the poor and marginalized, the phenomenon plays out differently as people struggle to put together diverse *portfolios* of activities in order to meet their basic needs. If the current trend continues, more and more activity in the rural non-farm sector will be included in these portfolios.

A post-job orientation to livelihood naturally implies that a great deal of attention be paid to the *informal* sector where most work is actually done. This is true for both city dwellers and the rural citizenry. It means that increasing emphasis must be given to self-employment and entrepreneurship in the context of agriculture, agro-industry and small firms. Partagogically-based program design entails detailed inquiry into the opportunities present in the informal sector and the skills needed to take advantage of them. This, in turn, will often involve the identification of new technologies slated for introduction and the service requirements they engender (e.g., the production or distribution of biological fertilizers and bio-pesticides for high-yield agriculture).

A *third* tenet of livelihood-centered partagogy is that [l]earners must be assisted in developing the skills they need to achieve a comfortable balance between *risk* and *security*. Risk is the product of the *change*, *variety* and *uncertainty* that characterize life in a globalized era where information is widely diffused. Security, in turn, is a product of *ingenuity*, *resilience* and *initiative*. Partagogy suggests that *flexibility* and *collaborativeness* are the forces that enable individuals to achieve the optimal balance between risk and security. Therefore, livelihood-based education and training must embrace methodologies that *promote ingenuity, resilience and initiative in a context of change, variety and uncer-*

tainty. Collaborative learning and socio-constructivist approaches to skills development (described fully in Chapter 2) are particularly well suited to this challenge.

It should also be noted that *change*, *variety* and *uncertainty* pose genuine risks. That is why linkages to social safety-net type policies are so critical to livelihood participation. Partagogy's emphasis on the formation, nurturance and development of *groups* is another important element in any strategy designed to foster flexibility. Groups often serve to mitigate risk either by creating *psychological comfort zones* for their members or, as is the case in many microenterprise development schemes, by actually engaging in some risk sharing.

Some skeptics may argue that *ingenuity*, *initiative* and *resilience* are difficult to foster in adults, especially if they are unschooled. However, the techniques of group problem solving, new knowledge construction and the application of knowledge to many different contexts have been shown to have a direct and positive bearing on these traits. Efforts that build on the many ways in which livelihood seekers already exhibit these characteristics will, no doubt, be successful in creating new reservoirs of strength.

A *fourth* pillar of partagogy concerns the need to plan *context-specific* approaches to enhancing livelihood participation opportunities. Program designs and policies must accommodate the differences that arise, for example, when a setting is rural rather than urban; when livelihood is derived from the formal rather than informal sector; when production practices are from the third rather than the first or second agricultures; when the population is literate rather than unschooled; and, when viable groups are present rather than absent from the local landscape.

Once these contextual factors are clearly defined, it is both possible and necessary to answer such key program design questions as the following:

- What technologies can best be introduced to upgrade productivity and expand livelihood opportunities?
- What are the best mechanisms to ensure that inputs essential to these technologies are supplied?

- What marketing and distribution channels need to be established or strengthened to support improvements in productivity?

- What linkages, if any, need to be created or strengthened between agriculture and industry to enhance livelihood possibilities related to these new technologies?

- If the technology to be introduced is an off-farm activity, what farming productivity improvements must be made in order for the off-farm activity to be viable?

Such an analysis is essential for achieving the proper mix of program inputs. However, there are certain inputs which need to be included in any program designed to enhance livelihood participation options. These include opportunities for *skills retooling*, *livelihood guidance*, and, particularly in formal-sector programs, *assistance with placement*. Additionally, when the livelihood strategy is concerned with *informal-sector entrepreneurial activity*, two additional program building blocks need to be introduced: credit and technical assistance.

From the discussion in this chapter it should be clear that many different kinds of projects can be effective in strengthening an individual's capacity to earn a livelihood. Vocational training, nonformal education, apprenticeship and extension all have the potential for enlarging livelihood participation opportunities *if* they are carefully designed to build on the *ingenuity* and *pragmatism* of the poor as evidenced by the complex, diverse and risk-prone strategies for survival they pursue.

The foregoing notwithstanding, some specific recommendations about each of the modalities discussed in this chapter can be proposed.

- *Vocational education* programs should incorporate a high degree of curricular and methodological flexibility in order to keep pace with changing labor-market and employment conditions. Such flexibility is also consistent with the need to help program participants themselves become flexible in their approach to earning a livelihood. Collaborative, group-centered modes of instruction that allow learners to build on what they know, construct new knowledge and solve novel, work-

related problems will also help prepare livelihood seekers for the challenges they will confront upon the program's conclusion.

- Vocational education programs should also seek to establish close ties with employers. Indeed, programs that can focus on specific employer needs and tailor offerings to known areas of labor demand are likely to be of great service to livelihood seekers.

- Post-training follow-up and structured opportunities for *skill retooling* are also essential components of quality vocational education programs. Linkages with NGOs, other educational institutions, and governmental programs can, quite possibly, facilitate the provision of such follow-up. Similarly, linkages with such institutions can be very productive if there is a need to incorporate literacy or numeracy into the vocational education program.

- *Nonformal education* programs are very strong in terms of their ability to foster community among learners and develop the skills needed for collaboration (including the knowledge of when and under what circumstances it is useful to collaborate). However, these programs are sometimes less adept at incorporating elements of retraining, job counseling, mobility assistance, and placement. Such features can be introduced directly into the nonformal education program or though cooperative relationships with NGOs and schools.

- *Apprenticeship* programs can be very successful in terms of enabling individuals to achieve mastery of particular crafts or trades. However, illiteracy and limited numeracy can be significant barriers to entry for many prospective apprentices. NGOs, employers, and governmental entities should explore complementary programs to close this knowledge gap.

- *Extension* programs are often very effective vehicles in developing new livelihood participation opportunities for both rural and urban populations. The contribution of these programs can, however, be strengthened by promoting technical packages based on best local practice; by helping clients to develop broad analytic skills and scientific reasoning in the context of whatever technical packages are introduced; and, by delivering extension services in settings most conducive to the

development of flexibility and collaboration (e.g., meetings of cooperatives or mothers' clubs). Complementary programming may also be a useful approach for introducing literacy and numeracy skills when the technical package requires such knowledge for successful adoption.

In concluding this discussion, the following observation seems particularly germane:

> *The basic question appears to be whether the key to a global employment-development strategy is to play "catch-up"—trying to bring millions of people around the world into jobs in industries and the public sector; or to play "leapfrog"—creating new forms of employment in the . . . global economy.* (Anderson, 1995)

chapter 6

Enhancing Participation Across the Lifespan: Issues and Next Steps

There is a fundamental rule of forecasting—I call it "Pohl's Law"—which says, "The more complete and accurate a prediction is, the less use it is . . ." What use is [an error-free] . . . prediction to us? It's accurate, so it's going to happen; we can't prevent it. We can't even dodge it by sneaking out the back way, for instance, because the prediction is also complete. So that sort of accurate and complete forecast turns out to have very little value to us; about the only effect it might have on our lives is to take some of the pleasure out. . . . In fact, the only time a forecast has any real utility is when it is not totally reliable; so that we have a chance, here and now, to take actions in the present that will encourage the good futures and help to avert the bad ones.

—Frederik Pohl, 1993

Introduction

For some it is the *global era*, or the *third wave*. Still others describe it as a *post-job period*, or the *continuing age of the future*. Regardless of nomenclature, the profusion of information technologies, the globalization of the economy, and the attendant upheavals unleashed by these two forces have combined at the end of the 20th Century to create an environment which calls for more knowledge, more abstract reasoning, more intelligence, and more initiative to earn a livelihood than ever before. *Flexibility, adaptability, collaborativeness*, and *problem-solving prowess* together make up the mortar that binds this new knowledge and emerging context together. It is amidst this ebb and flow of change that we have considered the question of human capacity development.

Definitions have framed our approach to the subject. Human *capacity* refers to an individual's ability to perform tasks which are necessary to survive and prosper. More specifically, it describes the constellation of skills, attitudes and behaviors individuals exhibit in the multiple roles they

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play: community member, family member, learner, worker, consumer and citizen. These roles are all situated in the context of four specific *core domains* of productive and purposeful interaction that lie at the heart of human capacity: *family life*, *livelihood*, *environmental stewardship*, and *civil society*.

The building blocks of human capacity development are *participation opportunities*, the potential *productive interactions* in which individuals can engage that allow them to contribute to the development of their nations, communities, and families. Participation opportunities span the course of a person's life cycle and vary accordingly. They include the chance to go to school, secure a livelihood, influence political or civic affairs, promote family development, and protect the environment. Among other things, such opportunities also encompass the chance to partake in agricultural extension activities, recreation, cultural events, or entrepreneurial behavior.

Accessed participation opportunities describe those participation opportunities that individuals actually utilize. As such, they represent a subset of the *available participation opportunities* found in any particular setting.

Human capacity *development* is what happens when *available participation opportunities are accessed and new participation opportunities created* in relation to these four core domains. Available participation opportunities represent a set of *potential inputs* to support human capacity development. The *output* of human capacity development can be expressed as the sum of those participation opportunities *accessed* by individuals, and the new participation opportunities *created* in the course of such engagements.

Human capacity has both *personal* and *social* relevance. Capable *individuals* are able to access and use available opportunities to earn a living, help shape the future of their communities, secure the conditions necessary for themselves and their families to maximize their innate potential, and use natural resources responsibly. Capable *societies*, in turn, are those which can equitably maximize the participation opportunities available to their citizens.

Human capacity development, therefore, is the product of an ongoing interaction between the individual and society. The *capacity development process* can be understood as an ever-broadening upward spiral in which participation

opportunities made available by society are accessed by individuals. As their capacities grow, individuals respond to their environment by creating new participation opportunities, both for themselves and others.

The notion of an ever-broadening spiral implies, of course, that within countries there is *fluidity* both in terms of *available* and *accessed participation opportunities*. In other words, the range of *settings* and *situations* in which productive interactions are possible does not remain constant. Indeed, it is constantly changing. Nevertheless, there is also an aspect of *continuity* to this dynamic since the inventory of participation opportunities—both available and accessed—at any given point in time, shapes all future inventories. As development occurs, a country's stock of available participation opportunities grows; so, too, does the degree to which its citizens avail themselves of these opportunities.

In light of this framework, the key to human capacity development is *equitably* enabling large numbers of children, women, and men to acquire (1) *specific content* in relation to key participation opportunities across the four core domains; (2) *specific interaction styles* which place a premium on flexibility, adaptability, collaborativeness and problem solving; and (3) *specific cognitive strategies for achieving higher levels of thinking and problem solving* in relation to key participation opportunities.

Partagogy is a methodology designed to respond precisely to these three needs. Its primary focus is to help individuals develop the skills and knowledge they need to access available participation opportunities and create new ones over the course of their lifespans. Partagogy's methodology and content are derived from a research-based identification of factors that *enable* or *inhibit* participation in the four core domains: *family life, livelihood, environmental stewardship*, and *civil society*.

Essential to the practice of partagogy is the belief that within the developing country context it is possible to create and sustain the infrastructure needed to develop the necessary knowledge, interaction styles, and cognitive strategies for life in an era of continuous change. However, new mental models, assumptions, policies and commitments are essential to such an enterprise. For example, there must be an understanding that the need for these higher-order skills is not confined to a small elite with special

workplace requirements and unusual aptitudes. On the contrary, effective participation in *each* of the four major domains of productive interaction—family life, livelihood, environment, and civil society—will increasingly call for these competencies.

Fortunately, they are well within reach of virtually all citizens. And a good thing, that is! For without doubt, the need for critical, flexible and creative thinking is bound to assume an ever-greater primacy as vast numbers of individuals confront an ever-expanding set of problems that are ambiguous, ill structured and unfamiliar.

The essence and underlying principles of partagogy can be summarized in ten broad statements:

1. **Partagogy focuses on creating the conditions that facilitate the transfer of knowledge to new settings.** Knowledge transfer is not automatic. Rather, it is associated with learning through observation, rule making, and definition as well as exposure to varied kinds of problems in authentic settings. The degree to which knowledge transfer occurs is a reflection of the degree to which *planning for knowledge transfer* takes place.

2. **Partagogy rests on a belief that enhancing skills and capacity related to participation behaviors requires holistic thinking, inter-ministerial coordination and a host of new, nontraditional partnerships involving both the formal and informal sectors of the economy.**

3. **Partagogy reflects the view that knowledge (for accessing available participation opportunities and creating new ones) is best constructed in a social context by communities of individuals.** The shaping and testing of ideas is a process in which anyone can and everyone must participate. Indeed, it is through such broad-based participation that partagogy contributes to equity and sustainability in human capacity development.

   In partagogical terms, *equity* refers to *the patterns by which individuals access existing participation opportunities or create new ones.* In equitable societies, gender, income, social class, ethnicity, and place of residence do not significantly skew the degree to which individuals access participation opportunities that enable them to earn a

livelihood, promote family development, engage in civic affairs, or protect the environment.

4. **Partagogy's goal is the enhancement of citizens' participation behaviors in four core domains—family life, livelihood, environmental stewardship, and civil society.** To achieve this, individuals must function as problem solvers, contributors and analytic discussants. This, in turn, requires a shift in emphasis from competition to collaboration with peers. For these reasons, partagogy is *interactive* and *community-oriented.* Individuals are supported in gaining the skills they need for living and learning *interdependently* rather than *independently.*

5. **Partagogy is context specific.** Its practice reflects a detailed knowledge of what individuals already know or do, the kinds of participation opportunities that exist within a community, by whom and under what circumstances these participation opportunities are accessed, and the formal and informal groupings that can be departure points for learning and enhanced participation.

6. **Partagogy is pragmatic.** Its practice does not depend on a single service delivery model or approach that is definitively best under all circumstances. Rather, it *can be applied within a broad range of program designs* in order to accommodate local needs, resources, and preferences. Consequently, elements of training, formal education, nonformal education, social promotion, social marketing, extension, and community mobilization can all find their way into a human capacity development strategy as long as partagogy's grounding principles are observed.

7. **Partagogy is adaptable with respect to content and skills.** Chiefly, it aims to *expand the participation behaviors of individuals* by helping them become more flexible, collaborative, adaptable, and capable of solving relevant problems. However, in many—if not most—cases, literacy, numeracy, good health and adequate nutrition are prerequisites to full participation in core domain activities. Therefore, partagogic practice involves determining the extent to which health, nutrition, literacy and numeracy factors need to be addressed at the policy and program levels.

8. **Partagogy requires methodological *consistency*.** Schools, for example, cannot apply partagogic principles with children, while communicating with their parents in a didactic fashion. Extension agencies cannot use the approach with their clients, while retaining traditional top-down, bureaucratic forms of communication and learning within their own operations. Training and retraining of frontline workers and their supervisory colleagues are necessary to achieve this methodological consistency and the appropriate organizational culture to support partagogical approaches to human capacity development. *Organizational development* within development organizations must undergird any attempt to introduce partagogy.

9. **Partagogy seeks to create meaningful linkages among *policies, programs* and *individual participation behaviors*** by identifying—for each of these levels of abstraction—those factors that *inhibit* or *enable* participation in the four core domains.

10. **Partagogy recognizes that knowledge transfer and the development of higher-order skills can best be accomplished when learners are given the chance to observe, engage in, and invent or discover expert (as opposed to novice) strategies for dealing with a particular type of problem.**

    This is best accomplished by:

    - identifying the processes within a task;
    - making them transparent to learners;
    - situating abstract tasks in authentic contexts so that the relevance of the task is apparent and the learner can embed new knowledge within an organizing structure;
    - helping learners actively interpret—rather than record—information so they can construct new knowledge for themselves;
    - extending to learners the opportunity to work at problem solving by actively sharing skills and expertise with one another;
    - unbinding knowledge from a single specific context in order to maximize knowledge transfer;

- enabling learners to recognize and respect what they already know as well as the knowledge that exists within their community;
- moving from the known to the unknown in terms of language, patterns of relationships, abilities and knowledge so learners can acquire extensive domain knowledge, an indispensable prerequisite for higher-order thinking skills;
- strengthening learners' ability to judge when new knowledge should be used;
- fostering in learners the ability to engage in metacognitive monitoring and control;
- providing learners with many examples of a new concept as well as an understanding of how essential features of the concept are reflected in a range of settings.

Answering questions, questioning answers

Over the next generation, the backdrop against which the human capacity development drama is enacted will be substantially altered. As people become accustomed (or suffer the consequences of their recalcitrance) to the idea of lifelong learning as a prerequisite for success in every imaginable pursuit, *the pool of learners will become more diverse in age, preparation, learning goals, backgrounds and needs. Existing institutions* — schools, employers, training institutes, extension agencies, clinics — *will need to learn how to cope with this diversity.*

Institutional coping strategies will undoubtedly take many different forms. In some cases it will entail a *narrowing down* of the client base while for others, the choice will be to *widen up* the constituencies addressed through programs and services. For example, as early childhood development practitioners increasingly come to value the importance of nutrition and health factors in the cognitive, social and physical growth of young children, they may seek to substantially increase their outreach and service delivery to parents through training, social promotion, and extension work. Such *widening up* would seem essential in carrying out the institutional mandate, but it confers new challenges on those whose task it is to design and implement the outreach program. Few, if any, are likely to have had experience in helping adults construct their own knowledge in any meaningful way.

In contrast, some organizations working to generate livelihood opportunities may *narrow down* their activities to serve only the formal or informal sectors, because they recognize that specificity with respect to skills and settings will best serve their clients' needs. In both instances—*narrowing down* and *widening up*—organizational strategic planning skills will prove critical.

There are, of course, other challenges that must be met if lifelong learning is to become a dominant modality within development-oriented institutions. Chiefly, there is the question of what kinds of resources can and should be extended to the lifelong learner beyond those skills required for independent or self-directed learning.

In countries where community-based libraries are absent from the landscape, what alternative information delivery systems can be developed that are affordable, sustainable, and efficacious in toppling barriers to participation in the four core domains? While this may seem to be a technical question (interactive radio versus inexpensive print media, for example), it is, first and foremost, a *strategic* issue. It entails *envisioning* the kind of citizenry a nation wants to develop in terms of three issues:

- The *specific content-based knowledge* citizens should have in relation to key participation opportunities;
- The *interaction styles* citizens need to survive, prosper and contribute to society;
- The *higher-level thinking and problem-solving skills* citizens need in order to avail themselves of key participation opportunities.

With technology rapidly changing, new options to address these matters will proliferate at the speed of a rolling stone on a steep incline. Some of the options will be "state of the art" and quite expensive, but many others will surely be within the range of affordability for most developing countries (e.g., radio, packet communication technology, print-based instruction supplemented by interpersonal contact). Once again, a strategic vision is needed. In particular, thinkers, planners and doers will need to grasp the significance and ramifications of two propositions:

- Technology will make it possible for learners to pursue multiple paths to accomplish the same learning objectives. Learning facilitators—teachers, extensionists,

trainers, supervisors, colleagues, and family members—will all have to learn to be the *guide on the side* rather than the *sage on the stage*. True facilitation is a far more difficult skill to master than traditional didactic behaviors. Thanks to technological advances, good facilitation will become a *sine qua non* of human capacity development.

- Technology will make collaboration a dominant mode of teaching and learning, research and service, work and play. Because of its ability to remove barriers of time and place while facilitating work across traditional boundaries, technology can do much more than merely transmit information efficiently.

It is against this backdrop that a host of new questions present themselves for further reflection, analysis, and, most importantly, experimentation. These queries could readily form the heart of an action-research agenda for human capacity development. Little has been systematically written in response to them, yet their resolution is essential if viable solutions to the problem of entrenched poverty are to be found.

The listing that follows is certainly far from complete. It is intended to illustrate—across the lifespan—the kind of knowledge that would vastly improve the outcomes of human capacity development efforts in poor countries.

- What features of informal education, training, and schooling practice can be most readily modified to help learners learn how to learn?

- What can schools, training institutions and extension services do to achieve heightened community participation (where "community" is understood to refer not only to parents or learners, but also to employers)? What implications are there—both negative and positive—of such an enlarged community involvement?

- How can new insights into the nature of learning and human capacity development best be brought to bear on educational, training, and social development programs in light of available, human and financial resources?

- How can the transfer of knowledge between school or training program and community be made as seamless as possible? How can whole communities be helped to use current knowledge to construct new knowledge?

- In terms of cost-effectiveness, what kinds of technologies (whether electronic or traditional) are best suited to enhancing participation in each of the core domains across the lifespan?

- How does the new emphasis on adaptability, flexibility, collaborativeness, and problem solving influence our perspective on "learning handicaps" or "impediments to learning"? For example, which is the more profound disability in a partagogically-oriented setting — immobility or an inability to work well with others?

- To what standards of accountability should human capacity development programs be held? What kinds of outcome measures most appropriately capture changes in participation behaviors?

Building capable organizations

Throughout this book, we have discussed human capacity development from the vantage point of the individual. However, it takes capable *organizations* — both public and private — to create and sustain meaningful human capacity development initiatives. What are the hallmarks of such organizations and how can *their* development be nurtured?

A capable organization is able to identify problems with respect to participation behaviors in the four core domains (family life, livelihood, environmental stewardship, and civil society), formulate effective policies to respond to these problems, design effective programs to reflect these policies, and manage their implementation in ways that optimize impact. In other words, the capable organization has the "ability to perform appropriate tasks effectively, efficiently, and sustainably" (Hilderbrand and Grindle, 1994). As we saw earlier in our discussion of *human* development, *capacity* is not a passive state, but part of an active process.

Organizational capacity building depends on the availability of people with appropriate skills; work and incentive systems that enable individuals to make productive use of those skills; and sets of systems that bring together individual efforts to make a joint impact (Cohen, 1993, citing a World Bank effort to build national capacity in Ghana).

When an organization is capable, it is able to coordinate, influence, and balance the *economic*, *political* and *social* factors that shape human capacity development. Economic

factors include growth rates; labor market conditions; international economic relationships and conditions; private sector activities; and development assistance. Political factors encompass leadership support, mobilization of civil society, stability, legitimacy, and political institutions. Among the critical social factors is the entire web of educational, training, extension and related institutions, as well as the structures which govern community organization and mobilization (Cohen, 1993). Such a comprehensive framing enables the capable organization to adopt a long-term perspective on human capacity development; to formulate sound policies and strategies that reflect this perspective; and, to implement corresponding projects and programs effectively.

In terms of more *general* characteristics, capable human capacity development organizations must be:

- agile in decision making;
- responsive to civil society in meeting basic economic and social needs;
- gifted at doing more with less;
- able to cope with continuous change and ambiguity as well as a steady stream of new information;
- innovative;
- facilitative in creating the conditions most propitious for the transfer of knowledge to new settings;
- comfortable with and inclined to use technical information, holistic thinking, and analysis in making decisions and solving problems;
- able to amass and deploy sufficient decision-making power to respond effectively to human capacity development challenges;
- participatory in the sense of encouraging debate, discussion and collaboration in decision making;
- accountable to the extent that those who are in charge of making and implementing decisions are held responsible for their actions;
- able to transcend concerns with specific problems and their solution by developing systems, processes, and cultures that ensure wise choices and the responsible use of resources;

- inclined to situate narrowly defined projects in the broader context of policy definition and development strategies; and
- able to forge partnerships that embrace nongovernmental organizations, private-sector entities and governmental agencies from multiple sectors.

Such characteristics emerge when there is an ongoing process of institutional capacity building that reflects the ten principles of partagogy enumerated earlier in this chapter. Central to this work is the continuous development of individuals (staff, volunteers and relevant others) who are affiliated with the organization. Other essential ingredients of institutional capacity building are the systematic development of strategic planning skills at all levels of the organizational structure, the development of good facilitation skills among all who have developmental responsibilities, constructive management in a task-oriented atmosphere, as well as an organizational ethos that values institutional learning and facilitates problem solving. Of course, the prudent management of financial resources is also indispensable in building organizational capacity.

At the *level of individual institutions*, the goals of such organizational capacity development are twofold: (1) the strengthening of targeted human resources (managerial, professional, technical and voluntary); and (2) the effective marshaling of resources to perform planning, policy formulation, and implementation tasks related to human capacity development. At the *national level*, the goal of efforts to promote human capacity development by strengthening organizational capabilities must be nothing less than the promotion of equitable societies, where gender, income, social class, ethnicity, or place of residence cannot significantly skew the degree to which individuals access participation opportunities that enable them to earn a livelihood, promote family development, engage in civic affairs, or protect the environment.

Implications for practice

Human capacity development occurs across the lifespan. Nevertheless, there are critical moments of transition that serve as powerful shapers of future participation behaviors. These junctures—periods when individuals are especially vulnerable to the good or ill effects of programs and policies—occur as individuals move into new life stages. At these times experience from the previous stage will often decisively determine how life in the next stage will be. Thus, for example, the child who enters school without the benefit of good health, nutrition, psychosocial support and varied opportunities for learning is soon playing catch-up. Unfortunately, it is a game that few children can win.

Similarly, the young adult who embarks upon the full-time pursuit of livelihood is not likely to have many options to choose from without the knowledge, skills, and attributes most directly relevant to earning a living. Future training opportunities, for the most part, will only be available to those who have received some prior training that makes them at least modestly employable or capable of generating an income.

Transitions can be strengthened and vulnerability reduced through supportive policies, good planning, and attention to appropriate linkages. Table 2 provides a comprehensive matrix for human capacity development program design, implementation and evaluation that can serve as a tool for navigating through the uncharted waters of transition. However, unlike the earth's oceans, there are few icebergs here. Indeed, danger only manifests itself when smooth transitions are assumed to occur automatically. Focused planning, coordination, and consultation are the compass points needed to stay comfortably on course in this sea of change.

Table 2

Human capacity development across the lifespan: critical issues

Stage	Design	Implementation	Monitoring and Evaluation
Early childhood years	What are current participation behaviors (in terms of available and accessed participation opportunities) in relation to prenatal care; psychosocial support for mother and child; early childhood development; adequate health care and nutrition? What are current barriers to accessing participation opportunities? How can these be overcome?	To what degree do activities build on the strengths drawn from what children and parents already know and do? To what degree has intersectoral coordination been achieved so that health, nutrition and cognitive development requirements are addressed? To what degree do programs build meaningful linkages to homes and schools that permit reciprocal, two-way influence?	Are programs reaching the most vulnerable populations? Given what is known about the influence they exert on the future growth and development of children, have relevant and measurable changes in participation behaviors been established? Are the principles of partagogy applied both in work with children and with the nurturant adults in their lives?

Table 2 (cont.)

Stage	Design	Implementation	Monitoring and Evaluation
Basic education years	What are current participation behaviors (in terms of available and accessed participation opportunities) in relation to school attendance, enrollment, promotion and parental involvement? How are current classroom practices likely to contribute to or hinder future participation behaviors? What barriers serve to limit participation in basic education ? How can these be overcome?	To what degree do activities build on the strengths drawn from what children and parents already know and do? To what degree does group work facilitate the construction of new knowledge? To what degree are higher-order thinking skills introduced and developed? To what degree has intersectoral coordination been achieved so that health, nutrition and cognitive development requirements are addressed? To what degree do programs forge broad-based linkages with communities (employers, parents, producers, service organizations)?	Are programs reaching the intended populations without distortions attributable to gender, ethnicity or region? Given what is known about the growth and development of children, have relevant and measurable changes in participation behaviors been established? Are the principles of partagogy applied consistently throughout the program? Are there measurable changes in outcome measures associated with internal and external efficiency (attendance, repetition, enrollment, achievement and mastery of competencies related to livelihood pursuits)?

Table 2 (cont.)

Stage	Design	Implementation	Monitoring and Evaluation
Livelihood years	What are the livelihood activities typically found in the portfolios of individuals targeted by a particular intervention? What kinds of skills do these activities require? What additional skills, if present, could enhance the livelihoods of those who perform these activities? What strengths can be built on in connection with these activities? What opportunities for livelihood are present in the formal and informal sectors? What are the principal barriers to accessing informal and formal sector livelihood participation opportunities? What formal sector trends will create new informal sector opportunities? What coordination exists among the various training and extension organizations? What population, health and nutrition services are needed to bolster livelihood efforts?	To what degree do activities build on the strengths drawn from what program participants already know and do? To what degree does group work facilitate the construction of new knowledge? To what degree are higher-order thinking skills and entrepreneurship developed? To what degree has intersectoral coordination been achieved so that health, nutrition and population services support and enhance livelihood prospects? To what degree do programs force broad-based linkages to communities (employers, families, producers, service organizations)? To what degree do programs operate in a manner that is consistent with labor market and economic development policies?	Are programs reaching the intended populations without distortions attributable to gender, ethnicity or region? Are there measurable changes in participation behaviors related to livelihood? What new participation opportunities have been created in the course of expanding livelihood participation? Are the principles of partagogy applied consistently throughout the program? Are there changes in outcome measures associated with livelihood improvement (e.g., income, equity, mastery of competencies related to livelihood pursuits)? What kinds of changes have occurred with respect to entrepreneurial behavior? What changes have occurred in terms of the number and kind of community-based groups present that can lend support to individuals as they engage in livelihood activities?

A final word

The practice of human capacity development is, for all intents and purposes, applied futurology. Its essence is the analysis of trends along with timely interventions to build upon what is good and alter what promises to be injurious. But, unlike market forecasting or general predictions about the future, human capacity development is rooted in the deepest of ethical and moral principles: that all people, regardless of their station in life, have the potential, the right—as well as the responsibility—to contribute meaningfully to their families, communities and nations. They also have the right to enjoy the benefits that flow from such contributions.

Human capacity development and the enhanced participation it engenders in family life, livelihood, environmental and civic activities, are bound to change as well as be changed by the forces of globalization and information profusion. The author and social critic Ken Kesey once noted, "You can count the seeds in an apple, but you can't count the apples in a seed" (Brand, 1986). What kind of future will we have if more attention is paid to the human capacity development approach that has been detailed in this book? Perhaps the best answer to this question is that our imaginations may be too limited to fully grasp all the benefits that a just, equitable and sustainable approach to human capacity development can confer on society.

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Bronfenbrenner, U. 1993. "The Ecology of Cognitive Development: Research Models and Fugitive Findings." In R.H. Wozniak and K. Fischer, eds., *Specific Environments: Thinking in Contexts*. Hillsdale, NJ: Erlbaum.

. 1989. "Ecological Systems Theory." In R. Vasta, ed., *Annals of Child Development*, 6. Greenwich, CT: JAI Press.

_____. 1979. *The Ecology of Human Development*. Cambridge, MA: Harvard University Press.

Brookfield, S. 1986. *Understanding and Facilitating Adult Learning*. San Francisco: Jossey-Bass.

Bruer, J. 1993. *Schools for Thought. A Science of Learning in the Classroom*. Cambridge, MA: The MIT Press.

Business Week. 1994. Issue No.3399, November 18.

Butterfield, E. and G. Siperstein. 1972. "Influence of contingent auditory stimulation upon nonnutritional sucking." In J. Bosma, ed., *Oral Sensation and Perception: The Mouth of the Infant*. Springfield, IL: Charles Thomas.

Butz, W., J.P. Habicht and J. DaVanzo. 1984. "Environmental Factors in the Relationship Between Breastfeeding and Infant Mortality: The Role of Sanitation and Water in q Malaysia." *American Journal of Epidemiology* 119(4):516-25.

C

Caldwell, J. 1986. "Routes to Low Mortality in Poor Countries." *Population and Development Review* 12:171-214.

Concluded that the schooling and literacy of women reduce fertility.

Campos, J., K. Barrett, M. Lamb, H. Goldsmith and C. Steinberg. 1983. "Socioemotional Development." In P.H. Mussen, ed., *Handbook of Child Psychology: Vol 2. Infancy and Developmental Psychobiology*. New York: Wiley.

Campos, R. 1989. "Soothing Pain-elicited Distress in Infants with Swaddling and Pacifiers." *Child Development* 60:781-792.

Carey, S. and R. Gelman, eds. 1991. *The Epigenesis of Mind: Essays on Biology and Cognition*. Hillsdale, NJ: Erlbaum.

Carnoy, M. 1992. *The Case for Investing in Basic Education*. New York: United Nations Children's Fund.

Chambers, R. 1994. "Poverty and Livelihoods: Whose Reality Counts?" An Overview Paper prepared for the Stockholm Roundtable on Global Change. Institute of Development Studies. Brighton, England: University of Sussex.

Chesterfield, R. 1994. *Indicators of Democratic Behavior in Nueva Escuela Unitaria (NEU) Schools*. Academy for Educational Development, Juarez and Associates, and IDEAS, Ltd. for the Basic Education Strengthening Project.

Coates, J., J. Jarratt and J. Mahaffie. 1991. *The Futurist* 25(3).

Cochrane, S. 1986. "The Effects of Education on Fertility and Mortality." EDT Discussion Paper 26. World Bank, Population and Human Resources Department. Washington, D.C.

Found that educating women ultimately reduces fertility. While in Asia and Africa fertility apparently increases with a few years of education, it declines as years of schooling increase. Also found that in Africa, a difference of one percentage point in the national literacy rate is associated with a two-year gain in life expectancy.

_____. 1979. *Fertility and Education: What Do We Really Know?* World Bank Staff Occasional Papers, No.26. Baltimore, MD: Johns Hopkins Press.

An oft-cited study which reported that the great majority (about 80 percent) of studies in areas where the illiteracy rate was under 40 percent found education to have a negative effect on fertility; but that this result was reversed in cases where the illiteracy rate was above 60 percent. A negative effect was much more frequently observed for female than

for male education and for urban than for rural areas. The frequently positive association of education and fertility when the overall level of education is low (illiteracy high), coupled with the negative association when the overall level of education is higher suggests interaction between the aggregate level of education and the individual level of fertility. This is consistent with a pattern in which the biggest reduction in fertility, as average education and income rises, is found among the more educated groups.

Study was among the first to assert that female education improves the understanding of biology, enhances acceptance and correct application of birth control methods, and delays marriage. Postulated that educational participation tends to extend the length of the child's economic dependency on the family; as a result, it may shift attitudes toward reduced family size. In addition, found that education tends to raise the age of marriage, decrease the desired family size, and improve fertility regulation.

., D.J. O'Hara and J. Leslie. 1982. "Parental Education and Child Health: Intracountry Evidence." *Health Policy and Education*. 213-250.

., D.J. O'Hara and J. Leslie. 1980. "The Effects of Education on Health." World Bank Staff Working Paper No.405. Washington, DC.

., *et al.* 1980. "The Effects of Education on Health." World Bank Staff Working Paper No.556. Washington, DC.

Cohen, J.M. 1993. "Building Sustainable Public Sector Managerial, Professional, and Technical Capacity: A Framework for Analysis and Intervention." Development Discussion Paper No.473. Cambridge, MA: Harvard Institute for International Development. Harvard University.

Cohen, S. and A. Parmelee. 1983. "Prediction of five-year Stanford-Binet scores in preterm infants." *Child Development* 54:1242-1253.

Colbert de Arboleda, V. and J. Arboleda. 1990. *Universalization of primary education in Colombia. The New School Programme*. Notes, Comments No.191, UNESCO-UNICEF-WFP Cooperative Programme, Paris.

Colclough, C. 1980. "Primary Schooling and Economic Development: A Review of the Evidence." World Bank Staff Working Paper No.399. Washington, DC.

Reviews the relationship between education and economic growth, and concludes that primary schooling increases productivity and thus economic growth. Finds that the provision of primary school education facilitates attainment of social policy objectives such as population control, health, nutrition, literacy and communication.

Asserts that the benefits of primary schooling arise from cognitive and non-cognitive behavioral changes induced by the schooling experience—even in systems of very low quality. Also asserts that evidence from fertility and farmer productivity studies suggests that individual behavioral changes that result from schooling are stronger when literacy is widespread than when it is concentrated. Postulates that an interactive effect exists between individual and community attitudes and values which significantly strengthens the economic and social case for universalizing access to primary schooling.

Coleman, J., *et al.* 1966. *Equality of Educational Opportunity*. (Coleman Report). Washington, DC: U.S. Government Printing Office.

Groundbreaking study which focused on input-output relations in US schools. Although the research had been designed explicitly to study equity, outcomes directed attention to the determinants of student performance. The study surveyed and tested 600,000 students in some 3,000 schools across the US. The report's major conclusion was that families, and to a lesser extent peers, were the primary determinants of student achievement; schools played a decidedly less prominent role.

The underlying model guiding this report and subsequent ones postulates that the output of the educational process (achievement of individual students) is directly related to a series of inputs. Policymakers directly control some of these inputs (i.e., the characteristics of schools, teachers and curricula). Others, such as inputs of families and friends, and the innate learning capacities of students themselves, cannot be directly affected by public policy. In addition, although achievement is usually measured at discrete points in time, the educational process is cumulative; past inputs affect students' current levels of achievement. For analysis of the report's methodology, see Hanushek and Kain (1972).

Collins, A., J. Brown and A. Holum. 1991. "Cognitive Apprenticeship: Making Thinking Visible." *American Educator* (Winter).

Collins, R. 1979. *The Credential Society: A Historical Sociology of Education and Stratification*. New York: Academic Press. See Thurow, L.

Consultative Group on Early Childhood Care and Development. 1994. *Coordinators' Notebook* (15). Haydenville, MA.

. 1993a. *Coordinators' Notebook* (13). Haydenville, MA.

. 1993b. *Meeting Basic Learning Needs through Programmes of Early Childhood Care and Development*. Paper prepared for "The Education for All Forum: The Second Meeting. Quality Education For All: Early Childhood Development." Haydenville, MA.

Cooper, R. and R. Aslin. 1990. "Preference for infant-directed speech in the first month after birth." *Child Development* 61:1584-1595.

Cornia, G., R. Jolly and F. Stewart, eds. 1987. *Adjustment with a Human Face*. Oxford: Clarendon Press.

Corvalan, V. 1988. "Trends in technical-vocational and secondary education in Latin America." *International Journal of Educational Development* 8:73-98.

Cotlear, D. 1986. "Farmer Education and Farm efficiency in Peru: The Role of Schooling, Extension Services, and Migration." EDT Discussion Paper 49. World Bank, Population and Human Resources Department. Washington, D.C.

In a study on the relationship between education and technological innovation, author stressed the importance of noncognitive aspects of education, such as the receptivity to new ideas which allow farmers to employ new technologies. Found that education also affects production by developing analytic modes of problem solving, by allowing farmers to think more abstractly and thus realize the relationship between technology and output. See also Eisemon.

Creth, S. 1995. "Creating a Virtual Information Organization." *Educom Review* 30(2).

Crouch, L., J. Spratt and L. Cubeddu. 1992. "Examining Social and Economic Impacts of Educational Investment and Participation in Developing Countries: The Educational Impacts Model (EIM) Approach." BRIDGES Research Report Series, No.12. Cambridge, MA: Harvard University.

Cummings, W. 1980. "Education and Equality in Japan." *Journal of Moral Education* 10:53-60.

Studied public moral education in Japan.

Cutright, P. 1969. "National Political Development: Measurement and Analysis." In M. Eckstein and H. Noah, eds., *Scientific Investigations in Comparative Education*. New York: Macmillan and Co.

Presents indicators of democracy, primarily for developing countries. Classifies states according to their degree of formal representation.

David, H. 1981. "Unwantedness: Longitudinal studies of Prague children born to women twice denied abortions for the same pregnancy and matched controls." In P. Ahmed, ed., *Pregnancy, Childbirth, and Parenthood*. New York: Elsevier.

., Z. Dytrych, Z. Matejcek, and V. Schuller. 1988. *Born Unwanted: Developmental Effects of Denied Abortion*. Prague: Avicenum, Czechoslovak Medical Press.

Davis, S. 1992. "Cross-Country Patterns of Change in Relative Wages." *NBER Macroeconomics Annual 1992*. Cambridge, MA: The MIT Press.

Studied declining wage differentials and expanded primary school enrollments in developing countries in the 1970s and 1980s.

Davison, J. 1995. "A Report on Gender Equity, Education, and Short-Term Hunger in the Sudan." *Technical Monograph Series* (4). Newton, MA: Education Development Center.

de Baessa, Y., *et al.* 1994. "Improving Educational Quality Project. Guatemala." Prepared for the Office of Education, Bureau of Research & Development. Washington, DC: USAID.

DeCasper, A. and W. Fifer. 1980. "Of human bonding: Newborns prefer their mother's voices." *Science* 208:1174-1176.

Del Rosso, J.M. 1992. *Investing in Nutrition with World Bank Assistance*. Washington, DC: The International Bank for Reconstruction and Development/The World Bank.

Denison, E. 1962. "Education, Economic Growth and Gaps in Information." *Journal of Political Economy* Vol.LXX (October).

Study supports the human capital approach. See also Becker, Schultz, Harbison.

de Soto, H. 1986. *El Otro Sendero: La Revolución Informal*. Lima: Editorial El Barranco.

de Tray, D. 1983. "Children's Economic Contributions in Peninsular Malaysia." Rand Note N-1839-AID. Rand Corporation. Santa Monica, CA.

Development Cooperation Information Department. 1994. *First Steps. Policy Memorandum on Children in Developing Countries*. The Hague: Ministry of Foreign Affairs.

Dewey, J. 1916. *Democracy and Education*. New York: Dutton.

. 1910. *How We Think*. Boston, MA: Heath.

Doeringer, P. and M. Piore. 1971. *International Labor Markets and Manpower Analysis*. Lexington: D.C. Heath.

Donaldson, P.J. and J.O. Billy. 1984. "The Impact of Prenatal Care on Birth Weight-Evidence from an International Data Set." *Med Care* 22.

D'Souza, S. and A. Bhuiya. 1982. "Socioeconomic mortality differentials in a rural area of Bangladesh." *Population and Development Review* 8:753-759.

Duncan, W. 1989. "Engendering School Learning." *Studies in Comparative and International Education No.16*. Stockholm: Institute of International Education.

Easterlin, R. 1975. "An Economic Framework for Fertility Analysis." *Studies in Family Planning* 6 (March):54-63.

Eimas, P. 1985. "The perception of speech in early infancy." *Scientific American* 204:66-72.

Eisemon, T. 1988. "The Consequences of Schooling: A Review of Research on the Outcomes of Primary Schooling in Developing Countries." BRIDGES Educational Development Discussion Papers No.3. Cambridge, MA: Harvard Institute for International Development.

Concluded that it is still unclear how the mechanisms by which school-learned knowledge is translated into better health behaviors. However, education may have a direct effect on child health and survival to the extent that schools provide children with informal health care, immunizations and dietary supplements.

Emphasized that the employment opportunities of any educated population are largely dependent upon the structure of the labor market and the types of employment opportunities within it.

Highlighted the fact that formal education is positively associated with women's participation in wage-labor and salaried labor. Postulated that such associations are due to the fact that education exposes girls to nontraditional attitudes, values and information and to a bureaucratic, work-like public institution.

_____. 1987. "Benefiting from Basic Education in Developing Countries: A Review of Research of the External Efficiency of Educational Investments." Special Studies in Comparative Education No.20. Buffalo: Comparative Education Center, SUNY Buffalo.

_____., J. Schwille and R. Prouty. 1990. "Empirical Results and Conventional Wisdom: Strategies for increasing Primary School Effectiveness in Burundi." BRIDGES Research Report Series. April. Cambridge, MA: Harvard University.

Conducted a survey which examined the effect of primary education on the cognitive skills of farmers in Kenya. Found that farmers who had been to school were able to construct causal models of events in the natural world and to demonstrate how these events could be controlled by humans. They were also able to actively observe, diagnose, and correct common agricultural problems better than farmers with fewer years of education.

_____. and V. Patel. 1988. "Effects of Literacy and Schooling on the Use of Oral Rehydration Therapy by Masai Mothers." *Social Science and Medicine.*

Ellis, W. and M. Ellis. 1989. "Cultures in Transition: What the West Can Learn from Developing Countries." *The Futurist* 23(2).

ERIC Clearinghouse on Elementary and Early Childhood Education. 1994. "Children's Nutrition and Learning." Urbana, IL: ERIC Digest.

Evans, D. 1981. "The Educational Policy Dilemma for Rural Areas." *Comparative Education Review* 25(2):232-243.

See Anderson, in Bridges.

Expert Group on the Expansion of Productive Employment for the 1995 World Summit for Social Development. 1993. Satlsjöbaden, Sweden.

Faegerlind, I. and L. Saha. 1989. *Education and National Development: A Comparative Perspective Second Edition.* New York: Pergamon Press.

Presents a comprehensive survey of the field.

Fardoust, S. and A. Dhareshwar. 1991. "World Economy in the 1990s." *The Futurist* 25(4).

Feuer, D. and B. Geber. 1988. "Second Thoughts about Adult Learning Theory." *Training* 25(12).

Fiala, R. and F. Ramirez. 1984. "Dependence, Service Sector Growth, and Economic Development, 1960-1975." *Comparative Social Research* 7:339-424.

Field, T., *et al.* 1986. "Tactile/Kinesthetic Stimulation Effects on Preterm Neonates." *Pediatrics* 77(5).

Figueroa, A. 1986. "Productividad y Educación en la Agricultura Campesina de America Latina." Rio de Janeiro: Programme of Joint Studies on Latin American Economic Integration.

Foster, P. 1992. "Vocational Education and Training: A Major Shift in World Bank Policy." *Prospects* 22(2):149-155.

_____. 1987. "Technical/Vocational Education in the Less Developed Countries." *International Journal of Education Development* 7:137-139.

_____. 1965. "The Vocational School Fallacy in Development Planning." In C.A. Anderson and M. Bowman, eds., *Education and Economic Development*. Chicago, IL: Aldine Publishing Company.

Fraiberg, S. 1974. "Blind Infants and Their Mothers: An Examination of the Sign System." In M. Lewis and L. Rosenblum, eds., *The Effect of the Infant on Its Caregiver*. New York: Wiley.

Friedman, S. and M. Sigman, eds. 1980. *Preterm Birth and Psychological Development*. New York: Academic Press.

Fuller, B. 1991. *Growing Up Modern: The Western State Builds Third World Schools*. New York: Routledge.

_____. 1987. "What School Factors Raise Achievement in the Third World?" *Review of Educational Research* 57(3):255-292.

Study points out that the relation between education and economic growth in the fields of manufacturing and trade is stronger in urban centers than in rural areas.

_____. 1985. "Raising School Quality in Developing Countries: What Investments Boost Learning?" Education and Training Department Discussion Paper EDT7. Population and Human Resources Department. Washington, DC: World Bank.

A comprehensive review/summary of 96 analyses of input-output relationships in developing countries. Gives qualitative discussion of the analyses, their results and their interpretation. In summary, the results of studies in developing countries do not make a compelling case for specific input policies. They do, however, indicate that direct school resources might be important in developing countries.

_____. and P. Clarke. 1994. "Raising School Effects While Ignoring Culture? Local Conditions and the Influence of Classroom Tools, Rules and Pedagogy." *Review of Educational Research* 64 (1).

_____. and R. Rubinson, eds. 1992. *The Political Construction of Education: The State, School Expansion, and Economic Change*. New York: Praeger Publishers.

Fuller, B. and S. Heyneman. 1989. "Third World School Quality. Current Collapse, Future Potential." *Educational Researcher*. 18(2).

_____., J. Edwards and K. Gorman. 1987. "Does Rising Literacy Spark Economic Growth? Commercial Expansion in Mexico." In D. Wagner, ed., *The Future of Literacy in a Changing World*. Oxford: Pergamon Press.

Furtado, C. 1977. "Development." *International Social Science Journal* Vol.XXIX(4):628-650.

Asserts that three conditions must exist in order to indicate a nation's progress toward 'development': 1. an increase in the efficiency of the production system of a society; 2. the satisfaction of the population's basic needs; and 3. the attainment of the objectives

sought by various groups in a society, which are linked to the use of scarce resources. Suggests that societies are 'developed' to the extent that there is broad, equal and equitable participation in the decision making process. Indicators of such 'development' include: political participation, access to political positions, and the development of national integration and cohesion.

Gallagher, J. 1994. "Teaching and Learning: New Models." *Annual Review of Psychology* (45).

Garcia, N. 1975. *Tecnología, comunicación y publicidad: Formas ocultas de dominación*. Caracas, Venezuela: Universidad Central de Venezuela, Escuela de Sociología y Antropología.

Gardner, H. 1991. *The Unschooled Mind*. New York: Harper Collins.

Gelman, R. and R. Baillargeon. 1983. "A review of some Piagetian concepts." In P. Mussen, ed., *Handbook of Child Development: Vol. 3 Cognitive Development*. New York: Wiley.

Giaoutzi, M., *et al.*, eds. 1988. *Small and Medium-Size Enterprises and Regional Development*. London: Routledge.

Glewwe, P., *et al.* 1994. "The Impact of Child Health on Educational Outcomes in a Developing Country: An Analysis of Longitudinal Data from Cebu, Philippines." (A Research Proposal).

_____. and H. Jacoby. 1993. "Delayed Primary School Enrollment and Childhood Nutrition in Ghana: An Economic Analysis." Living Standards Measurement Study Working Paper No.98. Washington, DC: The World Bank.

Goldsmith, L. and D. Schifter. 1994. "Characteristics of a Model for the Development of Mathematics Teaching." Center for the Development of Teaching Paper Series. Newton, MA: Education Development Center.

Griffin, K. and J. Knight, eds. 1990. *Human Development and the International Development Strategy for the 1990's*. London: Macmillan.

Various studies are described to provide a counterweight to the tendency to consider education, health and social services as consumer goods, i.e., luxuries in good times but not in bad. The enhancement of human capabilities is considered both a means and an end in itself. The benefits of education on farm productivity and other areas of employment are examined.

Gutmann, A. 1990. "Democratic Education in Difficult Times." *Teachers College Record* 92(1):7-20.

Hack, M., *et al.* 1991. "Effect of very low birth weight and subnormal head size on cognitive abilities at school age." *New England Journal of Medicine* 325(4):231-237.

Haddad, W., *et al.* 1990. "Education and Development: Evidence for New Priorities." World Bank Discussion Paper No.95. Washington, DC.

Hallak, J. 1990. *Investing in the Future*. Paris: UNESCO and Pergamon Press.

Hamilton, C. 1995. "Freedom from Hunger: An Evaluation Case Study." Unpublished paper, Monterey Institute of International Studies. Monterey, CA.

Hanushek, E. 1992. "The Trade-Off Between Child Quantity and Quality." *Journal of Political Economy* 100 (February):84-117.

A preliminary investigation of the contribution of family factors to educational achievement, based upon simple time allocation models.

_____, and J. Kain. 1972. "On the Value of 'Equality of Educational Opportunity' as a Guide to Public Policy." In F. Mosteller and D.P. Moynihan, eds., *On Equality of Educational Opportunity*. New York: Random House.

Examined the methodology and conclusions of the Coleman report. See Coleman.

Harbison, F. 1973. *Human Resources as the Wealth of Nations*. London: Oxford University Press.

Study showed the consistent patterns between levels of education and economic levels of development among countries. Showed that school enrollment rates at all three levels are considerably lower for the less advanced countries than for the advanced.

_____, and E. Hanushek. 1992. *Educational Performance of the Poor: Lessons from Rural Northeast Brazil*. New York: Oxford University Press.

Research pursues two distinct but interrelated inquiries. First, the authors evaluate the effectiveness of key inputs in Brazil's Northeast Rural Primary Project (Edurural), administered in the 1980s by the Brazilian Government with support from the World Bank. The project consisted of an integrated educational program instituted in 18 percent of the counties in the northeast region. It was designed to expand children's access to primary schooling, reduce wastage of educational resources inherent in grade repetition and dropout as children progress through the system, and to increase achievement by improving the quality of instruction. Second, using their analysis as the focal point, the authors develop a set of more general educational policy and practice guidelines. Miscellaneous findings include:

- If policies are implemented that increase student achievement, promotions will rise (p. 195).
- "Progress through primary schooling is directly related to the level of mother's education, reflecting both parental views on the importance of schooling and the ability of the family to aid the student with schoolwork. (This link suggests a long-term effect of expanded and improved education. Investments today in schooling will not only affect the current students but will also have a continued effect on future generations through education from parents.)" *ibid.*
- Higher opportunity costs for students reduce levels of schooling attainment. Specifically, the attractiveness, as well as the utter lack, of farming opportunities affects migration and dropout behavior. In areas where employment opportunities are higher or nonexistent for students, dropout rates are higher. Also, when students work while attending school, their performance suffers. *ibid.*
- In Brazil, gender-based school policies appear unlikely to have much effect on students' achievement—particularly that of females (p.200).
- Short-term malnutrition was associated with poorer school performance in Brazil. Moreover, the lowest-achieving strata of students had the largest nutritional deficits. *ibid.*

_____, and C. Meyers. 1964. *Education, Manpower and Economic Growth: Strategies of Human Resource Development*. New York: McGraw Hill.

Haverman, R. and B. Wolfe. 1984. "Schooling and Economic Well-Being: The Role of Non-MarketEffects." *Journal of Human Resources* 19(3):377-406.

Study determined that fertility levels are influenced most immediately by age of marriage, length of breast-feeding, and use of contraceptives, which are influenced in turn by the socioeconomic circumstances of the individual. One of these influences is the education of the mother.

Heimlich, J. 1992. "Promoting a Concern for the Environment." Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.

Henkoff, R. 1990. "Now everyone loves Head Start." *Fortune/Education*.

Herz, B., K. Subbarao, M. Habib and L. Raney. 1991. *Letting Girls Learn: Promising Approaches in Primary and Secondary Education.* World Bank Occasional Paper No.133. Washington, DC.

Heterick, R. 1995. "The Dreaded 'P' Word." *Educom Review* 30(1).

Heyneman, S. 1994. "Good Educational Governance: An American Export." Unpublished paper; article forthcoming in *The American School Board Journal.*

_____. 1983. "Education During a Period of Austerity: Uganda, 1971-1981." *Comparative Education Review* 27(3):403-413.

For summary, see Anderson, Bridges.

_____. and W. Loxley. 1983. "The Effect of Primary-School Quality on Academic Achievement Across Twenty-Nine High- and Low-Income Countries." *The American Journal of Sociology.* 88(6).

Hicks, L.E., R.A. Langham and J. Takenaka. 1992. "Cognitive and Social Measures Following Early Nutritional Supplementation: A Sibling Study." *American Journal of Public Health* 72.

Hicks, N. 1980. *Economic Growth and Human Resources.* World Bank Staff Working Paper No.408. Washington, DC.

High/Scope Educational Research Foundation. ND. "High-Quality Preschool Program Found to Improve Adult Status." Ypsilanti, MI: High/Scope Press.

Hilderbrand, M.E. and M.S. Grindle. 1994. "Building Sustainable Capacity: Challenges for the Public Sector." Prepared for the United Nations Development Programme. Pilot Study of Capacity Building. Cambridge, MA: Harvard Institute for International Development. Harvard University.

Hille, E., *et al.*, 1994. "School Performance at Nine Years of Age in Very Premature and Very Low Birth Weight Infants: Perinatal Risk Factors and Predictors at Five Years of Age." *The Journal of Pediatrics* 125(3).

Hines, J., H.R. Hungerford and A.N. Tomera. 1986-7. "Analysis and synthesis of research on responsible environmental behavior: A meta-analysis." *Journal of Environmental Education* 18(2).

Holsinger, D. and G. Theisen. 1977. "Education, Individual Modernity, and National Development: A Critical Appraisal." *Journal of Developing Areas* 11(3):315-33.

A review of modernity theory as postulated by McClelland, Inkeles, and others.

_____. and J. Kasarda. 1975. "Does Schooling Affect Birth Rates?" *School Review* 84(1):71-90. Study found that basic education improves hygiene and nutritional practices, which improve both child survival and fertility, while further education highlights the advantages of controlling family size.

Hopkins, B. and T. Westen. 1988. "Maternal handling and motor development: An intracultural study." *Genetic Psychology Monographs* 14:377-420.

Hughes, D., *et al.*, 1988. *The Health of America's Children.* Washington, DC: Children's Defense Fund.

Hunt, J. 1981. "Predicting Intellectual Disorders in Childhood for Preterm Infants with Birthweight Below 1501 Grams." In S. Friedman and M. Sigman, eds., *Preterm Birth and Psychosocial Development.* New York: Academic Press.

Hunter, R. and M. Turner. 1981. *Law-related Education Evaluation Project: Final Report Phase II,*

Year 1. Boulder, CO.: Law-related Education Evaluation Project.

Hyman, H. and C. Wright. 1979. *Education's Lasting Influence on Values*. Chicago, IL: University of Chicago Press.

Asserted that attitudes developed in the process of schooling persist over time.

Ichelov, O. 1991. "Political Socialization and Schooling Effects Among Israeli Adolescents." *Comparative Education Review* 35(3):430-446.

Determined that "school socialization had a stronger effect on political citizenship orientation than did the type of educational program in which the students were placed."

Igra, A. 1976. "Social Mobilization, Political Participation, and Economic Development." Unpublished Ph.D. dissertation, Stanford University.

Imel, S. 1991. "Collaborative Learning in Adult Education." ERIC Digest No.113. Columbus, OH: ERIC Clearinghouse on Adult, Career, and Vocational Education.

_____. 1989. "Teaching Adults: Is It Different?" ERIC Digest No.82. Columbus, OH: ERIC Clearinghouse on Adult, Career, and Vocational Education.

Inkeles, A. and D. Smith. 1974. *Becoming Modern: Individual Change in Six Developing Countries*. Cambridge, MA: Harvard University Press.

Followed the work of David McClelland and his 'Modernization Theory.' Developed a 'modernity scale' which focused on attitudes, as opposed to McClelland's personality traits. Asserted that social and economic development could not occur until an appropriate proportion of the population held modern attitudes, values and beliefs about work, quality of life, the ability and desirability to control one's environment, and other related values. Argued that the creation of modern values can be the result of human planning and that particular social institutions are of extreme importance in their emergence, for example, the socialization that takes place in families, schools and factories. Postulates that there is a direct causal link between five sets of variables (modernizing institutions, modern values, modern behavior, modern society and economic development.) Found that the influence of school on the adoption of modern practices was greater than that of the home environment, urbanization or factory experience. Modernization theory has been subject to considerable criticism. See Holsinger and Theisen, 1977.

International Labour Office. 1994. "Employment Challenge: An Agenda for Global Action." Paper prepared for the UNDP Roundtable on Global Change, Stockholm (July). Geneva.

International Labour Office. 1971. *Matching Employment Opportunities and Expectations. A Programme of Action for Ceylon: Report*. Geneva See Faegerlind.

Isabella, R. and J. Belsky. 1991. "Interactional synchrony and the origins of infant-mother attachment: A replication study." *Child Development* 60:373-384.

Izard, C. 1977. *Human Emotions*. New York: Plenum.

_____, R. Huebner, D. Risser, G. McGinnes and L. Dougherty. 1980. "The young infants' ability to produce discrete emotion expressions." *Developmental Psychology* 16:132-140.

Jagannathan, N. 1987. *Informal Markets in Developing Countries*. New York: Oxford University Press.

The author examines the effect of personalized relations on employment in informal markets and makes a case for looking at these relationships as a form of personal wealth.

Jain, A. 1985. "Relative Roles of Female Education and Medical Services for Decreasing Infant Mortality in Rural India." In S.B. Halstead, J.A. Walsh and K.S. Warren, eds., *Good Health at Low Cost*. New York: Rockefeller Foundation.

Jameson, K. 1988. "Education's Role in Rural areas of Latin America." *Economics of Education Review* 7(3).

Performed surveys of rural areas in Bolivia, the Dominican Republic, Guatemala and Paraguay to conclude that education has a positive and significant correlation with rural productivity in two of the four countries and that a strong link exists between education and the modernization of an environment.

Jamison, D. and L. Lau. 1982. *Farmer Education and Farm Efficiency*. Baltimore, MD: Johns Hopkins University Press.

_____ and P. Moock. 1984. "Farmer Education and Farm Efficiency in Nepal: The Role of Schooling, Extension Services and Cognitive Skills." *World Development* 12:67-86.

Found that farmers who can read, write, and understand numbers can allocate inputs more efficiently and thus increase productivity. In general, study found that direct returns to education are stronger in developing countries than in developed countries. Authors posit that this could simply reflect shortages in minimal skills in developing countries.

Johnson, D. 1980. "Group Processes: Inferences on Student-Student Interactions and School Outcomes." In J. McMillan, ed., *Social Psychology of School Learning*. New York: Academic Press.

Johnston, W.B. 1991. *Harvard Business Review* 69(2).

Jolly, R. and C. Colclough. 1972. "African Manpower Plans: An Evaluation." *International Labor Review* 106:2-3.

Based on evidence that labor markets in less developed countries are more imperfect than those of richer nations, the authors perform analyses of the limitations of rate-of-return analyses. For a review of the evidence upon which Jolly and Colclough base their analyses, see Turner 1965.

Joshi, V. 1981. "Rural-Urban Migration, Urban Unemployment and Economic Development." Lecture at the Center for International Studies, Harvard University, April 24.

Kakwani, M. and J. van der Gaag. 1990. "Structural Adjustment and Living Conditions in Developing Countries." Policy, Research and External Affairs Working Paper 467. World Bank, Population and Human Resources Department. Washington, D.C.

Kamens, D. 1988. "Education and Democracy: A Comparative Institutional Analysis." *Sociology of Education* 61:114-127.

Author's summary: "This article presents an institutional analysis of the effects of educational expansion on 1) the development of democratic political systems in new nations and 2) popular participation in politics within democratic systems. A major purpose of the article is to contribute to the emerging discussion of education that recognizes that many of the taken-for-granted effects of education on society and individuals are not universal. In considering how the effects of education are socially constructed, I present a series of hypotheses and discuss evidence from comparative research."

Kanter, R.M. 1991. *Harvard Business Review* 69(2).

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Study discusses the relation of a mother's education level/literacy to fertility and life expectancy of the next generation (improved infant and child survival rates.)

Kelley, A.C. and R.M. Schmidt. 1994. "Population and Income Change: Recent Evidence." World Bank Discussion Paper 249. Washington, DC.

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King, T., ed. 1980. "Education and Income." World Bank Staffing Paper No.402. Washington, DC.

Kiras, E., S. Mushkin and B. Billings. 1975. *Educational Outcome Measurement in Developing Countries*. Washington, DC: Public Services Laboratory of Georgetown Universtiy.

Kohn, A. 1991. "Caring Kids." *Kappan* 72(10):761.

Knight, J. and R. Sabot. 1987. "Educational Policy and Labour Productivity: An Output Accounting Exercise." *The Economic Journal* 97 (March):199-214.

Attribute large differences in productivity to school quality as measured by test scores.

Knowles, M.S. 1984. "Introduction: The Art and Science of Helping Adults Learn." In M.S. Knowles, *et al., Andragogy in Action: Applying Modern Principles of Adult Learning*. San Francisco: Jossey-Bass Publishers.

. 1980. *The Modern Practice of Adult Education*. Revised Edition. Chicago, IL: Association Press/Follett.

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Study linked low school participation rates and high repetition and dropout rates to a low degree of formal education in developing countries.

Kraft, R. 1994. "Teaching and Learning in Ghana: A Curriculum, Textbook, Syllabus and Handbook Analysis." The Mitchell Group, University of Colorado, June.

Kuhl, P., K. Williams, F. Lacerda, K. Stevens and B. Lindbom. 1992. "Linguistic Experiences Alter Phonetic Perception in Infants by 6 Months of Age." *Science* 255:606-608.

Kurz, K.M. and C. Johnson-Welch. 1994. *The Nutrition and Lives of Adolescents in Developing Countries: Findings from the Nutrition of Adolescent Girls Research Program*. Washington, DC: International Center for Research on Women.

Landers, C. 1992. "Towards a Comprehensive Child Development Strategy." (Working Document) New York: UNICEF.

_____. 1989. "Innocenti Global Seminar on Early Child Development. Summary Report." New York: UNICEF.

Largo, R., *et al.* 1986. "Language development of term and preterm children during the first five years of life." *Developmental Medicine and Child Neurology* 28:333-350.

Lau, L., D. Jamison and F. Louat. 1991. "Education and Productivity in Developing Countries: An Aggregate Production Function Approach." Policy, Research and External Affairs Working Paper 612. World Bank, Office of the Vice President Development Economics, and the Population and Human Resources Department. Washington, DC.

Studied the effects of primary education on economic growth in East Asian and Latin American countries. Found that primary education powerfully affected economic growth in twenty-two East Asian and Latin American countries. Also found that secondary education affected growth in fifty-four East Asian, Latin American, African and Middle Eastern countries.

Leonor, M., ed. 1985. *Unemployment, Schooling and Training in Developing Countries (Tanzania, Egypt, The Philippines and Indonesia).* Dover, NH: Croom Helm.

Author found that schooling did not instill in school leavers the necessary flexibility to adjust to changing labor markets. Vocational training also made schools ineffective in securing employment because the technologies taught were short-lived. The best schooling emphasized mental agility and the ability to acquire new skills.

Leslie, J. and D. Jamison. 1990. "Health and Nutrition Considerations in Education Planning: 1. Educational Consequences of Health Problems among School-Age Children." Food and Nutrition Bulletin 12 (September):191-204.

Study reviews the evidence on the relation between malnutrition and the various facets of education.

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LeVine, R., S. Levine, A. Richman, F. Uribe and C. Correa. 1994. "Schooling and survival: The impact of maternal education on health and reproduction in the third world." In L. Chen, A. Kleinman and N. Ware, *Health and Social Change in International Perspective.* Boston, MA: Harvard School of Public Health.

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Levinger, B. 1994. *Nutrition, Health and Education for All.* New York: United Nations Development Programme.

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_____. 1959. "Some Special Requisites of Democracy: Economic Development and Political Legitimacy." *American Political Science Review* 53:69-105.

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_____. and D. Jamison. 1979. "Some Determinants of School Participation in the Terai R Region of Nepal." Washington, DC: World Bank.

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_____. and A. Verspoor. 1991. *Improving Primary Education in Developing Countries*. New York: Oxford University Press.

_____., A. Verspoor, *et al.* 1990. *Improving Primary Education in Developing Countries: A Review of Policy Options*. Washington, DC: World Bank.

MacFarlane, A. 1977. *The Psychology of Childbirth*. Cambridge, MA: Harvard University Press.

McClure, V.S. 1989. *Infant Massage (Revised): A Handbook for Loving Parents*. New York: Bantam Books.

McCinn, N. 1994. "The Impact of Supranational Organizations on Public Education." *International Journal for Education Development* 14(3):289-298.

_____. 1980. *Education and Development in Korea*. East Asian Monographs. Cambridge, MA: Council on East Asian Studies, Harvard University Press.

McKay, R.H., L. Condelli, H. Ganson, B.J. Barrett, C. McConkey and M.C. Plantz. 1985. *The impact of Head Start on children, families, and communities: Final report of the Head Start evaluation, synthesis and utilization project*. Washington, DC: U.S. Department of Health and Human Services.

McMahon, W. 1984. "The Relation of Education and R&D to Productivity Growth." *Economics of Education Review* 3(4):299-313.

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Mincer, J. 1989. "Human Capital and the Labor Market: A Review of Current Research." *Educational Researcher* (May):27-34.

Ministerio de Saude, y Instituto Nacional de Alimentaçao e Nutriçao. 1993. *Avaliçao do PROPAPE/Alagoas com Entoque na Area Economica*. Brasilia: MX/INAN.

Mogollon, O. 1990. *Programa Escuela Nueva, los microcentros rurales*. Bogota: Ministerio de Educación.

., V. Colbert de Arboleda and B. Levinger. 1977. *Hacia La Escuela Nueva*. Bogota: Editorial Ministerio de Educación Nacional.

Moock, P. 1994. "Education and Agricultural Productivity." *International Encyclopedia of Education* 1:244-254. Oxford: Pergamon Press.

. and J. Leslie. 1985. "Childhood Malnutrition and Schooling in the Terai Region of Nepal." World Bank Discussion Paper. Washington, DC.

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Nag, M., N. White and R. Peet. 1980. "An Anthropological Approach to the Study of Economic Value of Children in Java and Nepal." In H. Binswanger, R. Evenson, C. Florencio, and B. White, eds., *Rural Household Studies in Asia*. Singapore: Singapore University Press.

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Ngomba, P. and J. Oxenham. 1980. "Adjusting Education to Economic Crisis." *IDS Bulletin* 20 (January):1-10.

Nie, N., S. Verba and J. Petrocik. 1979. *The Changing American Voter*. Cambridge, MA: Harvard University Press.

Nielsen, H. 1977. *Tolerating Political Dissent: The Impact of High School Social Climates in the United States and West Germany.* Stockholm, Sweden: Almqvist and Wiksell International.

Noss, A. 1990. "Education and Adjustment: A Review of the Literature." Policy, Research and External Affairs Working Paper 701. World Bank, Population and Human Resources Department. Washington, DC.

Orozco-Gomez, G. 1988. "Commercial Television and Children's Education: the interaction of socializing institutions in the production of learning." Harvard University Graduate School of Education, unpublished dissertation.

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Panton, D. 1993. "Dual Labour Markets and Unemployment in Jamaica: A Modern Synthesis." *Social and Economic Studies* 42(1).

The author examines the role of education and vocational training, as well as other factors (migration, labor market factors, population growth) on employment in the formal and informal sectors in Jamaica.

Patel, S.J. 1985. "Educational Miracle in Third World, 1950 to 1981." *Economic and Political Weekly* 20:1312-1317.

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Perkins, D.N. and G. Salomon. 1989. "Are Cognitive Skills Context-Bound?" *Educational Researcher* 18.

Plater, W.M. 1995. "The Library: A Labyrinth of the Wide World." *Educom Review* 30(2).

Pohl, F. 1993. "The Uses of the Future." *The Futurist* 27(2).

Pollitt, E., K. Gorman, P. Engle, R. Martorell and J. Rivera. 1993. "Early supplementary feeding and cognition." *Monographs of the Society for Research in Child Development* 58(7) Serial No.235.

Portes, A., *et al.*, eds. 1989. *The Informal Economy: Studies in Advanced and Less Developed Countries.* Baltimore, MD: The Johns Hopkins University Press.

The studies in this volume examine some of the contradictions about the process of informalization. The editors' goal is to balance polarized views of this sector as the solution to economic problems or merely a throwback to the 19th century. Analyses of the factors that contribute to the expansion of the informal economy as well as its effects on developing countries' economies are presented.

Pratt, H. 1954. "The Neonate." In L. Carmichael, ed., *Manual of Child Psychology (Second Edition).* New York: Wiley.

Preston, S. 1984. "Children and the Elderly: Divergent Paths for America's Dependents." *Demography* 21(November):435-57.

Provides a general discussion and review of the issues involved with changing demographic patterns in the United States. In particular, looks at changes in birth rates, divorce rates and their effects on learning and achievement.

Psacharopoulos, G. 1993. "Returns to Investment in Education: A Global Update." Working Paper Series No.1067. World Bank, Office of the Director, Latin America and the Caribbean. Washington, DC.

_____., ed. 1991a. *Essays on Poverty, Equity and Growth.* Oxford: Pergamon Press.

_____. 1991b. "Vocational Education Theory VOCED 101: Including Hints for 'Vocational Planners'." *International Journal of Educational Development* 11:193-199.

_____.1989. "Time Trends of the Returns to Education: Cross-National Evidence." *Economics of Education Review* 8(3):225-231.

Found that an increase in the number of educated workers leads to decreased earnings differentials between schooled and unschooled laborers.

_____. 1987. "To Vocationalize or Not to Vocationalize? That is the Curriculum Question." *International Journal of Education Development* 33(2):187-211.

_____. 1985. "Returns to Education: A Further International Update and Implications." *Journal of Human Resources* Vol. XX(4):583-597.

Found that education had a significant effect on earnings and that the rate of return to education is high. Estimated that the returns to completed primary education are 27 percent and the returns to secondary education are 15–17 percent. Also found that the returns to education in developing countries are higher than those for more industrialized nations; but that these returns diminish over time.

_____. 1982. "The Economics of Higher Education in Developing Countries." *Comparative Education Review* 26:139-159.

_____. 1980. "Higher Education in Developing Countries: A Cost-Benefit Analysis." Washington, DC: World Bank, Education Department.

_____. 1975. "Earnings and Education in OECD Countries." Paris: Organisation for Economic Co-operation and Development.

_____. 1973. *Returns to Education: An International Comparison.* New York: American Elsevier Jossey-Bass.

In a study of twenty countries, both developed and less developed, author calculated the average social rate of return to primary schooling as 26.2 percent. Rate of return for developing countries ranged from a low of 9 percent to a high of 33 percent. Medium and low-income countries appeared on the average to have similar earnings ratios for the primary/no schooling levels; for secondary/primary levels; and for higher/secondary levels. However, the earnings ratios were much greater in the low-income countries than in the medium and high income countries.

Some scholars question to which extent observed differences in earnings can be directly related to differing levels of educational attainment, and to which extent these differences can be attributed to other factors such as innate "ability," parental socioeconomic status, and geographic location (urban v. rural).

_____. and H. Patrinos. 1993. "Secondary Vocational Education and Earnings in Latin America." *Vocational Aspect of Education* 45(3).

_____. and Z. Tzannatos. 1992. *Case Studies on Women's Employment and Pay in Latin*

America. Washington, DC: World Bank.

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_____, and W. Loxley. 1985. *Curriculum Diversification in Colombia and Tanzania: An Evaluation*. Baltimore, MD: Johns Hopkins University Press.

_____, and M. Woodhall. 1985. *Education for Development: An Analysis of Investment Choices*. New York: Oxford University Press.

Asserts that the effects of education are truly multisectoral or intersectoral. The multisectoral effects are often implicitly recognized in terms of educational effects on a broad array of socioeconomic indicators. "But there have been very few efforts to provide a truly integrated analysis of the intersectoral effects of education." BRIDGES 4/92 p.7.

Rajan, S. and A. Jayakumar. 1992. "Impact of Noon Meal Programme on Primary Education: An Exploratory Study in Tamil Nadu." *Economic and Political Weekly* (October 24-31).

Ramirez, F. and J. Boli. 1982. "Global Patterns of Educational Institutionalization." In P. Altbach, G. Kelly, and R. Aronove, eds., *Comparative Education*. New York: Macmillan and Co.

_____, and R. Rubinson. 1979. "Creating Members: The Political Incorporation and Expansion of Public Education." In J. Meyer and M. Hannan, eds., *National Development and the World System*. Chicago, IL: University of Chicago Press.

_____, R. Rubinson and J. Meyer. 1973. "National Educational Expansion and Political Development: Causal Interrelationships, 1950-1970." Paper presented at the SEADAG Seminar on Education and National Development, Singapore, September.

Ramsey, J.M. and H.R. Hungerford. 1989. "The effects of issue investigation and action training on environmental behavior in seventh grade students." *Journal of Environmental Education* 23 (2).

Rauner, M. 1993. *Education and Democracy: A Review of the Literature*. Washington, DC: Social Sector Policy Analysis Project, Bureau for Research and Development, USAID.

Reich, R. 1991a. *Harvard Business Review* 69(2).

_____. 1991b. *The Work of Nations*. New York: Vintage.

Reiffers, J. 1982. *Transnational Corporations and Endogenous Development*. Paris: UNESCO.

Reimers, F. 1993. *Education and the Consolidation of Democracy in Latin America: Innovations to Provide Quality Basic Education with Equity*. Harvard Institute for International Development.

_____. 1991. "The Impact of Economic Stabilization and Adjustment on Education in Latin America." *Economics of Education Review* 35(2).

Among other things, noted that Ministries of Education in Latin America often lack political standing, as well as the basic information, to argue strongly for education in the face of other development sectors and interest groups.

Reissland, N. and R. Burghart. 1987. "The Role of Massage in South Asia: Child Health and Development." *Social Science Medicine* 25(3).

Resnick, L.B., ed. 1989. *Knowing, Learning, and Instruction: Essays in Honor of Robert Glaser*. Hillsdale, NJ: Erlbaum.

———. 1987a. "Learning in School and Out." *Educational Researcher* 16.

———. 1987b. *Education and Learning to Think*. Washington, DC: National Academy Press.

American educator who discusses the objectives of elite versus mass systems of education. Asserts that the objective of elite systems of education has historically been to train privileged members of society in the use of reason, rhetoric, mathematical and scientific thought, and other 'higher thinking order' skills. In contrast, most mass education systems were established to produce minimal levels of competence in the general population in areas such as basic reading and computation skills, health and citizenship training. As a result, the current push for teaching higher order thinking skills in primary schools is a new idea.

Rice, R. 1985. "Infant Stress and the Relationship to Violent Behavior." *Neonatnal Network*.

Robinson, W., *et al*. 1986. "Third Annual Report of the Study of USAID Contributions to the Egyptian Basic Education Program." Vol. II. Washington, DC: Creative Associates.

See Anderson, M. in Bridges.

Rogoff, B., J. Mistry, A. Goncu and C. Mosier. 1993. "Guided participation in cultural activity by toddlers and caregivers." *Monographs of the Society for Research in Child Development* 58(8) Serial No.236.

———. 1990. *Apprenticeship in Thinking: Cognitive Development in Social Context*. New York: Oxford University Press.

Rohde, J. and T. Sadjimin. 1980. "Elementary School Pupils as Health Educators: Role of School Health Programmes in Primary Health Care." *The Lancet* 1350-1352.

Rozenzweig, M. and T. Schultz, 1987. "Fertility and Investment in Human Capital: Estimates of the Consequences of Imperfect Fertility Control in Malaysia." *Journal of Econometrics* 36:163-84.

———. 1985. "The Demand and Supply of Births." *American Economic Review* 75 (December): 992-1015.

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Rutter, M., *et al*. 1979. *Fifteen Thousand Hours*. Cambridge, MA: Harvard University Press.

Sameroff, A. and M. Chandler. 1975. "Reproductive risk and the continuum of caretaking casualty." In F.D. Horowitz, ed., *Review of Child Development Research, 4*. Chicago, IL: University of Chicago Press.

Samoff, J. 1993. "The Reconstruction of Schooling in Africa." *Comparative Education Review* 37(2):181-222.

Samuels, B. 1986. "Infant mortality and low birth weight among minority groups in the United States: A review of the literature." In *Report of the Secretary's Task Force on Black and Minority Health: Volume VI: Infant Mortality and Low Birth Weight*. Washington, DC: U.S. Department of Health and Human Services.

Saxe, G., S. Guberman and M. Gearhart. 1987. "Social processes in early number development." *Monographs of the Society for Research in Child Development* 52,2 (Serial No.216).

Schiefelbein, E. 1992. *Redefining Basic Education for Latin America: Lessons to be Learned from the Colombian Escuela Nueva.* Paris: UNESCO International Institute for Educational Planning.

Schienbaum, K. 1984. *Beyond the Electoral Connection: A Re-Assessment of the Role of Voting in Contemporary Politics.* Philadelphia, PA: University of Pennsylvania Press.

Schimpp, M. 1992. *A.I.D. and Democratic Development: A Synthesis of Literature and Experience.* Washington, DC: USAID.

Schlechty, P. 1991. *Schools for the Twenty-First Century.* San Francisco: Jossey-Bass Publishers.

Schrage, M. 1990. *Shared Minds: The New Technologies of Collaboration.* New York: Random House.

Schultz, T.P. 1989a. "Returns to Women's Education." PHRWD Working Paper No.001. Washington, DC: World Bank.

. 1989b. "Human Capital in Restoring Equilibrium." Paper presented at the Conference on Human Capital and Economic Growth, Institute for the Study of Free Enterprise Systems, State University of New York at Buffalo, May.

. 1980. "Nobel Lecture: The Economics of Being Poor." *Journal of Political Economy* 88(4):639-652.

A more recent iteration of Schultz, 1961 (See below.)

. 1961. "Investment in Human Capital." *American Economic Review* 51(1):1-17.

First asserted that education was the major source of acquired abilities, or human capital, which raised the productivity of workers. Opponents countered that individuals with more ability were likely to receive more education than those with less ability; therefore calculations of education's effect on productivity needed to account for initial ability. See Psacharopoulos, 1975.

Stated that education was not to be viewed simply as a form of consumption but rather as a productive investment. Argued that education does not only improve the individual choices available to workers; but that an educated population provides the type of labor force necessary for industrial development and economic growth.

Schultz, T.W. 1972. "A 'Guide' to Investors in Education with Special Reference to Developing Countries." In K. Thompson and F. Champion, eds., *Education and Development Reconsidered.* Volume 2. Bellagio, Italy: Rockefeller Foundation and Ford Foundation.

. 1971. "Investment in Human Capital." In M. Blaug, ed., *Economics of Education.* Middlesex, England: Penguin Books.

Schwartz, I. 1990. "Low Birth Weight Effects of Demographic and Socioeconomic Variables and Prenatal Care in Pima County, Arizona." *The Western Journal of Medicine* 152(6).

Selowsky, M. 1967. "Education and Economic Growth: Some International Comparisons." *Economic Development Report* (83). Cambridge, MA: Center for International Affairs, Harvard University.

Siegler, R. 1986. *Children's Thinking.* Englewood Cliffs, NJ: Prentice-Hall.

Simmons, J. 1974. "The Determinants of Earnings: Towards an Improved Model." World Bank Staffing Paper No.173. Washington, DC.

Asserted that, while education may be a key to development, opportunities in the labor market may nonetheless be scarce due to other factors, such as the absence of a job market for mid- and higher-level manpower or the lack of a population policy that supports planning techniques.

Slavin, R. 1994. *Educational Psychology.* Boston, MA: Allyn and Bacon.

Sontag, L. 1941. "The Significance of Fetal Environmental Differences." *American Journal of Obstetrics and Gynecology* 42:996-1003.

Spiers, J. 1993. "The Future of the Factory." *Fortune* 128(16).

Standing, G. 1978. *Labour Force Participation and Development.* Geneva: ILO.

Summers, L. 1992. "The Most Influential Investment." *Scientific American* 267(2).

Super, C. 1976. "Environmental Effects on Motor Development: A Case of African Infant Precocity." *Developmental Medicine and Child Neurology* 18:561-567.

_____., M. Herrara and J. Mora. 1990. "Long-Term Effects of Food Supplementation and Psychosocial Intervention on the Physical Growth of Colombian Infants at Risk of Malnutrition." *Child Development* 61:29-49.

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Thomas, D., J. Strauss and M. Henriques. 1990. "Child Survival, Height for Age and Household Characteristics in Brazil." *Journal of Development Economics.*

Thurow, L. 1974. *Generating Inequality.* New York: Basic Books.

Author develops the 'credentialist' notion that education does not increase productivity or expand the economy, but instead only alters the criteria by which workers are hired. He asserts that more educated workers receive the higher paid/higher status jobs, while the less educated receive what remains. Thus, employment opportunities are not expanded, but instead reallocated, so that higher education levels are needed to do the same work that was previously done with less schooling.

Tilak, J. 1989. *Education and Its Relation to Economic Growth, Poverty and Income Distribution: Past Evidence and Further Analysis.* World Bank Discussion Paper 46. Washington, DC.

Reviews the research on the effect of years of formal schooling on economic development.

Tokman, V. 1987. "The Informal Sector Today: A Policy Proposal." Paper presented to the round table in Managing Human Development, Budapest 6-9 September.

Torney-Purta, J. and J. Schwille. 1986. "Civic Values Learned in School: Policy and Practice in Industrialized Nations." *Comparative Education Review* 30(1):30-49.

A comparative exploration of values education among a number of industrialized countries. Authors present seven assertions concerning values in education: "1. No institution with education as its primary aim can be value neutral. 2. Countries differ in the values that characterize their political cultures and their stated educational goals. 3. No Western industrialized country has had a uniformly high level of success in transmitting civic values, perhaps because subtle incompatibilities between goals exist. Approaches stressing rote and ritual appear to be counterproductive. 4. The learning of values is strongly influenced by many factors that are outside the control of educators and educational policymakers, such as national culture and subcultures, economic structures and unique historical events. 5. Notwithstanding the importance of nonschool and nationally idiosyncratic factors, educational policy has been somewhat effective in bringing about desired changes in values. 6. A number of nations have developed curricular goals and associated materials to promote common core values. In some countries, these programs give more importance to collective welfare, in others to individual benefits (though no country completely neglects either.) 7. The learning of values in school is not limited to mandated programs of moral and civic education. Students also learn values (especially cooperation, rights of self-expression, respect for other persons, and respect for authority) from the ways that schools embody these values in organization, teaching practice

and social climate."

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