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PEDAGOGICAL CHANGES FOR EDUCATIONAL FUTURES IN LATIN AMERICA AND THE CARIBBEAN

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Introduction

The purpose of this paper is to consider pedagogical changes for raising educational equality and equity in Latin America and the Caribbean. Much has been written on this subject, and much of what has been written in the past is still valid at present. But, there are serious questions about whether the pedagogy of the present, even if buttressed by more resources, greater efficiency and improved equity is the educational system that will serve best the future of Nations. This paper will focus on that future and will argue that improving efficiency and equity in the present schooling systems of Latin America and the Caribbean is a sensible direction in the short-run. But, it is a limited strategy because it does not take account of long-run implications of globalization and what is known about human intelligence and human development.

Accordingly, this paper will be organized as follows: Section I will provide a brief picture of what needs to be addressed in the short run. Section II will address the challenge of preparing the population to adjust to major changes in social, economic, and political settings. Section III will provide a brief picture of one movement that is addressing these changes, the Accelerated Schools Project.

I. The Present Situation

This will be the shortest part of my paper for two reasons. The first is that there exist some very good analyses of the present challenges with regard to quality, efficiency, and equity for Latin America and the Caribbean (LAC), and I have little to add to these. The second is that I wish to place most of my effort into consideration of the future (five or ten years and beyond), since that will soon be upon us. I have found the most recent report on this subject of the Inter-American Development Bank, Reforming Primary and Secondary Education in Latin America and the Caribbean to be an excellent summary of the present situation and what needs to be done.[1] This report emphasizes some of the present challenges. These include:

- Low educational attainments of workers (5.2 years in the early nineties), even relative to workers in other countries at similar levels of educational development.
- Low educational quality and poor results. Four out of five Latin American students from low-income backgrounds are unable to read written passages, even after completing six years of schooling.[2] Test scores for the few Latin American and Caribbean countries that participated in international comparisons of achievement showed that the regional representatives scored almost at the very bottom of the international distribution.[3]
- Both income inequality and educational inequality are the highest of any world region.
- Citizenship education seems to be lacking to non-existent.

[1] Inter-American Development Bank, Reforming Primary and Secondary Education in Latin America and the Caribbean: An IDB Strategy (Washington, DC: IDB, May 2000).
[2] E. Schiefelbein, E., School-Related Economic Incentives in Latin America: Reducing Drop-out and Repetition and Combating Child Labor, Innocenti Occasional Papers, Child Right Series No. 12 (Santiago: CIDE, 1996).
[3] L. Wolff, Educational Assessment in Latin America: Current Progress and Future Challenges, Occasional Paper Series (Washington, DC: Inter-American Dialogue, 1998) shows comparisons.

To these I would add three others.

- Inefficiencies in the use of educational resources are substantial because of high repetition and dropout rates[4] and corruption in the use of educational funds as well as inadequate teacher salaries and spending on the wrong inputs.[5]
- In much of Latin America and the Caribbean the rich and middle class send their students to private schools and lack interest and commitment in providing resources and support for the schools that "other peoples" children attend. This is a severe political obstacle.
- Inadequacy of teacher preparation and of continuous teacher professional development.

Reform Agenda

The reform agenda is straightforward and makes a great deal of sense to try to raise quality and improve efficiency and equity. The IDB Report calls for vastly improved teacher education with higher standards for certification and hiring of teachers. Improvements in teacher working conditions are emphasized to recruit better teachers who will put in more effort. It suggests that better systems of teacher accountability and incentives will improve teacher performance.[6] The Report recommends investing in more and better textbooks and teaching

[4] E. Shiefelbein, op. cit.
[5] See R. Harbison and R. Hanushek, Educational Performance of the Poor: Lessons from Rural Northeast Brazil (New York: Oxford University Press, 1992).
[6] Incentives for performance for both teachers and schools is very prominent in the U.S. literature and increasingly prominent in the Latin American discussions on educational reform. For the U.S. see E. A. Hanushek and D. W. Jorgenson, Eds., Improving America's Schools: The Role of Incentives (Washington, DC: National Academy Press, 1996). For Latin America see, for example, F. A. Arjona, H. Tappata, G. Maradona, and A. Sanchez, El Nuevo Debate Educativo: Incentivos E Instituciones (Mendoza, Argentina: Bolsa De Comercio De Mendoza, 2000).

materials, a conclusion that is supported by considerable evidence.[7] Consideration of appropriate uses of new technologies is also recommended, not as ends in themselves, but as potential cost-effective solutions to specific educational challenges.[8] The Report also recommends changes in the management and organization of schools including the possibilities of decentralization and greater involvement of parents and community members. These are features that are integral to the highly successful Escuela Nueva, which has transformed most of the rural schools of Colombia and has also been adopted in other countries.[9] Finally, it recommends programs to address early childhood development as a crucial method of preparing students from low-income backgrounds. The Report has additional recommendations for secondary schools including additional spending, curriculum changes, and substantial increases in instructional time. The Report concludes with educational reform strategies and the potential roles of the IDB.

All of this makes a great deal of sense for addressing existing educational needs, but there are reasons that future educational needs will require a very different kind of school and pedagogy than is now prevalent. Most schools in Latin America and the Caribbean use a didactical approach that can be thought of as "direct instruction." Students are given a rigid curriculum to master through reading, exercises, teacher lectures, and homework. Pupils are tested for their ability to memorize the educational liturgy, and the examinations determine much

[7] For example, see Harbison and Hanushek, op. cit.; M. E. Lockheed, A. Verspoor, and others, Improving Primary Education in Developing Countries (New York: Oxford University Press, 1991); J. P. Farrell & S. Heyneman, eds., Textbooks in the Developing World: Economic and Educational Choices (Washington, DC: The World Bank, 1989).

[8] For a comprehensive report on this subject, see C. Castro (ed.) Education in the Information Age (Washington DC: Inter-American Development Bank, 1998).

[9] V. Colbert, C. Chiappe, and J. Arboleda, "The New School Program: More and Beter Primary Education for Children in Rural Areas in Colombia," In. H. M. Levin and M. Lockheed, Effective Schools in Developing Countries (Washington, DC: The Falmer Press, 1993), pp. 52-68. E. Schiefelbein, In Search of the School of the XXI Century (Santiago, Chile: UNESCO/UNICEF, 1991). McEwan, P. J. The effectiveness of multigrade schools in Colombia. *International Journal of Educational Development, 18*(6) (1998), 435-452.

of their future.[10] Even so, it is acknowledged that Latin American and Caribbean students do not fare well in international comparisons of educational achievement, and this is one of the reasons that there are calls for educational reform. In addition, this style of learning does much to disengage large numbers of students who find the school experience to be so disagreeable that it is a major cause of dropping out.[11]

In the next section I will address why we need major changes in the organization and pedagogy of schools to accommodate both potentials in human development and changes wrought by technological change and globalization. That is, simply improving what we presently do and making it more equitable and efficient in the use of resources will not suffice in the long run.

II. Adjustment to Disequilibrium[12]

Education has long been viewed as one of the most important strategies for raising the productivity of both individuals and nations. In the past, considerable attention has been devoted to the expansion of enrollments and educational opportunities to improve the labor force. It was assumed that the type of education provided was appropriate, so it was only necessary to expand

[10] Those of us who believe that more participatory approaches are needed that emphasize understanding rather than mere memorization need to be aware that cultures that do not encourage questioning (for religious and social reasons and that emphasize rigid definitions of right and wrong will be difficult contexts into which to embed more participatory forms of learning. An excellent source on this challenge is found in the anthropological study of Victoria Baker, "Does Formalism Spell Failure? Values and Pedagogies in Cross-Cultural Perspective," In George Spindler, Education and Cultural Process, Anthropological Approaches (Prospect Heights, IL: Waveland Press, 1997).

[11] Kelly, Deidre (1995) "School Dropouts" In Martin Carnoy (ed.), International Encyclopedia of Economics of Education, Second Edition (Oxford, UK: Pergamon), pp.308-313.
Fine, Michelle, Framing Dropouts: Notes on the Politics of an Urban High School (Albany, NY: State University of New York Press: 1990).

[12] This section draws heavily on my presentation as the Lee Hysan Lecturer at the Chinese University of Hong Kong in September 1998. H. M. Levin, Education and the Ability to Deal With Change, Education Policy Studies Series, Occasional Paper No. 15 (Hong Kong: Hong Kong Institute of Educational Research at the Chinese University of Hong Kong, November 1998).

the number of graduates at each level to accommodate the growth of production and rising productivity needs.

Such an assumption presumed great stability in the types of jobs, occupations, and industries that characterize the economy, for qualitative changes in education were viewed as largely unnecessary. Although minor adjustments in educational requirements might be made, the existing curriculum and instructional strategies were considered adequate to meet labor force goals. But, in the last decade or so and continuing into the new millennium, the economies of countries have been and will be changing at a rapid pace as revolutions in information technology and globalization have created new industries and replaced old ones and transformed jobs and occupations. These disjunctions have raised the question of whether educational expansion and improvements in school quality along traditional lines are in themselves adequate to increase the productivity and economic output of the labor force or whether more dramatic qualitative changes in education are also necessary to accommodate economic change. The purpose of this section is to focus on the issue of education for economic change and human development. It will proceed by reviewing the traditional links between education and productivity and proceed to new insights and understandings from both an economic and educational perspective. It will conclude with a picture of a different type of education that might accommodate change while meeting the more traditional requirements of an educated and productive labor force.

Education and Productivity

At the beginning of the human capital revolution some 40 years ago with its recognition of the special contribution of education to economic growth and productivity, the precise links between what happens in schools and classrooms and productivity in workplaces were largely

ignored. Rather, it was just assumed that more educated persons possessed greater human capital and were more productive. Statistical studies of the education of workers and their earnings were highly correlated. The fact that more educated workers earned more in labor markets was convincing enough that something about the educational experience contributed to workplace productivity. Exactly what aspects of education contributed to productivity were unknown and unexamined as long as it appeared that employers were willing to pay more to obtain the services of educated workers. In the competitive marketplace, employers have an incentive to provide greater rewards to their more productive workers or risk losing them. Therefore, the higher earnings associated consistently with more educated workers meant that such workers must be more productive.

If there were any single explanation that might be given for this phenomenon, it was that better-educated workers have more knowledge and skills, which translate into higher productivity. Thus, studies of what schools actually produce focused primarily on student achievement as measured by test scores and examinations. Persons with more education not only have higher earnings, but also higher test scores, and it seemed logical that the higher test scores reflected levels of skill and knowledge that increased productivity and earnings.

Within this frame of analysis it was enough to know that education increased skills and skills increased productivity and earnings. Workers with greater skills could learn their jobs more quickly and do them more proficiently. They could work more intelligently and with greater precision and could accomplish more within the same time period. Further, their education qualified them to train for more complex job situations. Thus, not only would they be more productive in a given job level, but they were more likely to qualify for more demanding jobs because of their higher levels of trainability. In the early days of the human capital

revolution, the pattern of economic returns to educational investments in a more productive labor force and economy were adequate to justify that investment without questioning the precise types of skills that education provided. The economics of human capital investment in education had no specific implications for what should be taught in school and how it should be taught. Whatever the content of schooling, it was considered to be effective because of the tie between the amount of education received and earnings.[13]

The only debate about schooling content in these early years raged over whether students should receive a general education at the secondary level or a vocational education when viewing education as an investment in economic growth.[14] Advocates of a vocational education argued that it is the specific know-how about jobs that provides value in production and that this can best be learned in a vocational curriculum. Advocates of a general education argued that technical change in the life of a worker and the need to be continually trainable suggest that a more liberal education be provided with specific training on the job. There was no attempt to open the black box of schooling and no particular reason to do so.

It was not until the seventies that newer insights on the role of education in production began to raise questions about the content of schooling. In 1970 Finis Welch published a paper that went beyond the traditional way of thinking about schools and productivity.[15] Welch argued that workers not only carry out a standard set of work tasks, but they can make an important contribution to production by efficiently allocating the resources of the enterprise. Workers have access to specific resources of the firm in their productive activities. Even how they allot their

[13] The classic treatise on human capital is the pioneering exposition by Gary Becker, Human Capital (New York: Columbia University Press, 1964).
[14] P. Foster, "The Vocational School Fallacy in Development Planning," In C. A. Anderson and M. J. Bowman, Eds., Education and Economic Development (Chicago, IL: Aldine, 1965).

[15] F. Welch, "Education in Production," Journal of Political Economy, Vol. 78, No. 1 (January/February 1970), pp. 35-59.

own time to different tasks can have an important productive effect. And, educated workers are better able to gather and process information that signals the relative costs and productivities of different allocative choices. In an important article, T. W. Schultz, who later won the Nobel Prize in Economic Science, generalized this phenomenon to the ability to deal with disequilibria in production, the situation in which the set of inputs chosen is inefficient in terms of the ratio of their cost to productivity.[16] Particularly in a dynamic setting where there are continuous changes in input prices and productivity, partially resulting from new technologies and market alignments, traditional methods of resource allocation may be inefficient. What abilities are needed to adjust to such disequilibria and make the firm more productive? More education and higher education, in particular, imparts in workers the abilities to master an understanding of their roles in the production process and to tacitly make adjustments to changes in the prices and productivity's of inputs. These continuous adjustments allow a return to equilibrium in the economic sense of equating costs and revenues at the margin and maximizing productivity and profits.[17] Neither Welch nor Schultz addressed which specific aspects of schooling contributed to the allocative abilities of workers.

Parallel developments in labor economics reinforced the importance of allocative decisions by workers. Economists had puzzled on why employment agreements or contracts were often incomplete.[18] That is, although they may specify particular duties of the worker, they also leave a large chasm of ambiguity in what most workers are expected to do, a chasm that grows with higher-level (professional, technical, and managerial) occupations. And, often

[16] T. W. Schultz "The Value of the Ability to Deal With Disequilibria," Journal of Economic Literature, Vol. XIII, No. 3 (September 1975), pp. 827-46.
[17] The organizational implications of education and the effects of education in adjusting to disequilibria are found in H. M. Levin, "Improving Productivity Through Education and Technology," In G. Burke and R. Rumberger, eds., The Future Impact of Technology on Work and Education (London: Falmer Press, 1987), pp. 191-214.
[18] See P. Milgrom and J. Roberts, Economic Organization & Management (Englewood Cliffs, NJ: Prentice Hall, 1992), pp. 126-165.

workers are evaluated and rewarded more on their performance on aspects of their jobs that are not well-specified than the parts that are. Such incomplete contracts are not an oversight. Their purpose is to incorporate provisions for workers that enable them to take actions and make decisions that cannot be stipulated in advance, because such actions and decisions will depend upon circumstances that arise—often in an unpredictable fashion.

With this insight it becomes necessary to consider more fully what type of education would best promote the ability to deal with change and uncertainty that an increasing share of workers will confront in their lifetimes.[19] A traditional worker might be able to do a highly proficient job by mastering the know-how required for routinized production. But the ability to make allocative choices in behalf of the enterprise requires more than the experience and rules-of-thumb developed in a static work environment. Presumably, higher levels of education require students to process information, locate the appropriate facts, set out criteria for decisions, and make choices, and these experiences can contribute to making intelligent choices in the workplace. The more education that an individual receives, the more likely that he or she will possess these attributes. Of course, this is not always the case if higher education simply requires more memorization of facts and little emphasis on problem solving. The important point is that more educated workers have a greater ability to acquire the information necessary to understand the facts and to anticipate and address contingencies and uncertainty than less educated workers.

But, with this new focus there must necessarily be greater scrutiny paid to the content of education from the perspective of economic productivity at all levels of education. A focus on memorization and examinations that dominates all levels of education will not contribute much to this type of problem-solving behavior. Can these capabilities be enhanced by a different

[19] This is a major theme in a new volume by Herbert Altrichter and John Elliott, eds., Images of Educational Change (Philadelphia: Open University Press, 2000).

approach to what schools do? Can they be generalized into a type of education that makes future workers more adaptable to the impacts of large changes in markets, technologies, and prices that have been evident in recent years? Can they lead to workers with both intrapreneurial skills (seeking out and promoting innovation within work organizations) as well as entrepreneurial skills? Before answering those questions, it is important to note two other major developments in the knowledge-base that are pertinent.

Endogenous Growth

Traditionally, the economic growth literature viewed technological advance as being exogenous to the economic system, that is, being determined by factors outside the workings of the economy. However, this has raised serious questions about why technological advance and its economic returns differ among nations when its fruits are largely disseminated and available across national lines. More recent interpretations view both the generation of technological progress, in pure and applied forms, and its productive adoptions as endogenous. Endogenous economic and technical phenomena are those that are determined by the dynamics of the economic and educational systems through their overall organization, incentives, availability and diffusion of information, and investments that are made in education and research and development.[20] More to the point, educational investments may generate technological advances through creating more adaptable workers as well as promoting research and development. Through education it is possible to produce more scientists, engineers, and entrepreneurs who can capitalize quickly on new knowledge; a higher level of general technical literacy among the population; information flows that provide quick access to the latest developments; and research and inquiry in higher education (and industry) that can generate technical advances. Nations can

[20] For a survey see P. M. Romer, "The Origins of Endogenous Growth," Journal of Economic Perspectives, Vol. 8, No. 1 (Winter 1994), pp. 3-22.

focus on an educational system that generates new knowledge and ideas and their rapid transmission through the latest information technologies. At the same time the education system can focus on producing individuals who seek such information to gain competitive edges in production or establish new product and service markets. Such individuals will have great ability to adjust to disequilibria as new knowledge arises. Thus, there is an opportunity for educational systems to consider their internal goals and operations as an instrument of economic policy (along with other goals such as political socialization and human development) that provides benefits to the nation as a whole beyond those received by individual workers and firms.

These theories support traditional human capital premises that education increases the productivity of individuals. But, in addition, investment in education produces "externalities" by increasing the common stock of knowledge available generally to all individuals and firms and the adaptability of the workforce to change with an impact on economic growth independent of the individual productivity increments from each more educated worker. One explanation is that such an accumulation of educated talent makes possible both the production and use of research and development that is not possible at lower levels of educational accumulation. The precise mechanisms by which all of this works out are presently being debated, but there is increasing empirical support for the importance of educational externalities beyond the effects of individual workers.[i21] It is likely that the type of worker who can adjust to disequilibria and make allocative decisions will not only improve his or her own productivity, but also that of colleagues who benefit from better resource allocation. These types of workers will also adjust more quickly to changes in technology at the societal (e.g. Internet) and firm level.

[21] See N. Gemell, "Reviewing the New Growth Literature," New Political Economy, Vol. 3, No. 1 (1998), pp. 129-34.

Successful Intelligence

Distinguished psychologist and testing expert Robert Sternberg has spent two decades studying what makes people successful in life, including working life. On the basis of research studies, he has concluded that successful intelligence comprises three components: analytical intelligence, creative intelligence, and practical intelligence. Analytical thinking is required to solve problems and to judge the quality of ideas. Creative intelligence is required to formulate good problems and ideas in the first place. Practical intelligence is needed to use the ideas and their analysis in an effective way in one's everyday life.[22]

As Sternberg points out, what schools do and what their examinations measure address primarily the dimension of analytical intelligence, and only a small portion of that. Schools focus principally on stylized facts and operations rather than problem-solving and analysis. This is why memorization in itself can be so effective in school success when rote learning devices measure success. Understanding and applying productively the memorized facts and knowledge are not valued highly in much teaching and learning. For this reason Sternberg refers to examination results as "inert intelligence" or inactive intelligence, not to be confused with his three dimensions of successful intelligence.

Note the confluence of ideas that we have presented, even though they emerge from different disciplines and literatures. The ability to adjust to disequilibria and the need for change requires a flexible personality with analytic, creative, and practical insights that enable the individual to respond to contingencies as they arise. These may entail small adjustments and decisions in a daily work environment, larger decisions as major changes take place in the enterprise, and larger conceptual shifts as demands arise for great changes in behavior in

[22] R. J. Sternberg, Successful Intelligence (New York: Plume, 1997), pp. 128-9. Sternberg is an extraordinarily productive researcher and writer, but this source has considerable references to his ideas and research findings.

response to major and unforeseen events. And, if all or most workers have these characteristics, firms and economies will be adaptable and inventive in raising productivity and developing new products and services capturing the externalities essential to endogenous growth theories.

These dimensions are further reinforced by organizational changes that are occurring in high productivity workplaces. Those workplaces with high value-added require not only workers with the appropriate knowledge to make good allocative decisions, but also with the personality traits that enable them to use that knowledge and work productively with co-workers. The following list obtained from studies of high productivity workplaces is just a reminder of these traits, but also suggests a high compatibility with the three dimensions of successful intelligence identified by Sternberg.[23]

- Initiative. The drive and creative ability to think and perform independently.
- Cooperation. Constructive, goal-directed interaction with others.
- Working in Groups. Interaction in work-groups directed towards both short-term goals of efficient task or activity accomplishment and the long-term goal of group maintenance.
- Peer Training. Informal and formal coaching, advising and training of peers.
- Evaluation. Appraisal, assessment and certification of the quality of a product or service.
- Reasoning. Evaluation and generation of logical arguments including both inductive and deductive approaches.
- Problem-Solving. Identification of problems, hypothesis testing on causes, generation of alternative solutions and their consequences, selection of an alternative, and implementation of a solution.

[23] This list is derived from the research of H. M. Levin and R. W. Rumberger which is reported in "Education, Work, and Employment in Developed Countries: Situation and Future Challenges," Prospects, XIX (1989), pp. 205-24.

- Decision-Making. Employing the elements of problem-solving on an on-going basis in the workplace..
- Obtaining and Using Information. Deciding which information is relevant, knowing where to find it, obtaining it, and putting it to use.
- Planning. Establishing goals as well as scheduling and prioritizing work activities to reach goals.
- Learning Skills. Cognitive and affective skills that facilitate the acquisition of new knowledge.
- Multicultural Skills. Understanding how to work with persons from other cultures in terms of language, communication styles, and different values

This list is neither complete nor does it obviate the need to acquire many of the standard cognitive competencies that the schools have stressed traditionally.[24] What it does suggest is that there exist competencies that the schools need to address to create a workforce qualified for high-value-added workplaces, and that are not addressed by a traditional classroom that is examination-driven and where students are expected to memorize large amounts of facts and subject-matter to the exclusion of other activities. It has also been largely embodied in national policy in the U.S. for improving worker preparation although the highly decentralized organization of the U.S. educational system means that implementation is slow.[25]

Examination Results and Productivity

[24] These competencies do not seem to be limited to the workplace. A very recent report (September 2000) by child development experts on what is needed to make an effective transition into kindergarten and elementary school has concluded that "… many children enter kindergarten without some basic social and emotional eompetencies, such as following directions, working independently or in a group, and communicating well with peers and teachers." It concludes that these traits are as important or more important for school success than just the cognitive dimensions. See The Child Mental Health Foundations and Agencies Network, A Good Beginning (New York: 2000).

[25] See Secretary's Commission on Achieving Necessary Skills, U. S. Department of Labor, What Work Requires of Schools (Washington, DC: U.S. Department of Labor, 1991). Also, Secretary's Commission on Achieving

The traditional view is that if we can get examination scores high enough, we will have a qualified workforce that will be highly productive and support a successful economy. Certainly that view has predominated in the past. There is no question that students need competencies in literacy, numeracy, science, and technology, and knowledge of their societies and the world. While these are necessary competencies, they are not sufficient ones to embrace the possibilities inherent in the new information technologies and globalization. Evidence from the U. S. over the last three decades has shown that standardized test scores account for only a small portion of the variance in earnings and productivity of persons with similar levels of education, usually less than 10 percent.[26] That is, 90 percent of the variance in workplace performance of similarly educated persons cannot be explained by differences in the examination scores of different individuals. There is something about more education in itself beyond the test scores that accounts for the powerful relation between education and various indices of productivity.

To show the practical impact of the low explanatory power of test scores with regard to productivity, we can consider the following employment decision. Assume that the goal of an employer is to hire only persons who will have productivity above the average for the workforce, that is, in the upper-half of the productivity distribution. Further, suppose that employer addressed this goal by selecting only those prospective employees who were in the top 16 percent of the population on the test score. In fact, about 42 percent of these "high-performers" on examinations would have productivity levels below the average for all workers. The use of test scores, alone, for employment decisions would select large numbers of false negatives (those who can be highly productive, but have low test scores) and large numbers of false positives

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Necessary Skills, U. S. Department of Labor, Learning a Living: A Blueprint for High Performance (Washington, DC: U. S. Department of Labor, 1992).

[26] H. M. Levin, "Educational Performance Standards and the Economy," Educational Researcher, Vol. 27, No. 4 (May 1998), pp. 4-10.

(those with low productivity, but who would be selected because of their high test scores). Such a policy would result in a poor allocation of workers and a potentially, large, suboptimal performance for the economy.

The limited potential of achievement on standardized examinations to create economic success has also been verified internationally. It is obvious that one of the incentives for a nation to perform well in international comparisons of educational achievement is the assumption that such advantages will lead to more productive and competitive labor forces and economic advantage. Unfortunately, the evidence does not support this assumption. Mathematics is the most uniform subject taught among all of the countries tested in the international studies of educational achievement. Thus research was initiated to estimate the relationship between examination results in mathematics from the 1996 Third International Mathematics and Science Study with indicators of national economic success. Sophisticated statistical methods were used to ascertain the degree to which the examination results for the 40 countries for which data were available were connected statistically to their economic performance. Perhaps, surprisingly, virtually no relationship was found. Nor was there any statistical relationship between scores from past studies and subsequent economic growth. [27]

This further reinforces the observation that examination scores seem to play a much smaller role than popularly believed in accounting for the economic growth of a country, and that other factors are probably understated. But, even these findings are based upon data that have been derived primarily from the traditional economic systems that have characterized most countries, not their knowledge-based industries. As shifts are made to industries based upon high-productivity workplace organizations and products and services in such areas as

[27] P. Robinson, "Literacy, Numeracy and Economic Performance," New Political Economy, Vol. 3, No. 1 (1998), pp. 143-49.

information technologies, biotechnologies, and customized services, it is reasonable to assume that the demands for a worker who is adaptable and more fully prepared for these realities will become more pressing.

III- Towards Pedagogical Change

In my view, the long-term priority is to establish schools in which enrichment replaces memorization, in which student projects replace drill, and in which student assessment is based upon what Sternberg has called measures of successful intelligence, not inert intelligence. Of course there would be provision for students to learn basic skills, but these would be integrated into the activities of a different type of school. Robert Sternberg has emphasized the integration of the three types of intelligence in the education of every child. The inculcation of analytic intelligence would extend far beyond memorization of facts to analysis and problem solving. Creative intelligence would be manifested in the solution of problems in non-ordinary ways, encouraging the viewing of the world from different perspectives and utilizing artistic devices and metaphors to address one's creative instincts. Practical intelligence would be reflected in applying analytical and creative intelligence to real world situations.

In my view these approaches can best be satisfied through creating what is normally thought of as gifted and talented instruction. This is the approach used by the Accelerated Schools Project which was established in the U.S. in 1986 and presently encompasses about 600,000 students in 1,100 schools in 41 states as well as Australia and Hong Kong.[28] In its sixteenth year, the Accelerated Schools Project is one of the largest and oldest comprehensive

[28] Hong Kong has 50 schools in its Accelerated Schools Project working in these new directions, despite its students performing among the world leaders in international comparisons of achievement. A number of schools were established in the State of Minas Gerais in Brazil, about six years ago, but we have not had contact with these schools nor the opportunity to provide the training and support to sustain them, so we do not know how they have fared in the absence of this support.

school reforms in the U.S., so it draws upon considerable experience at transforming schools.[29] The goal of Accelerated Schools is to transform schools educating at-risk students from an emphasis on drill to one that embodies the pedagogy for gifted and talented students (superdotados) so that students will meet both their developmental needs and those required for adult life through an integrated system of powerful learning.[30] Powerful learning is embodied in research projects, artistic endeavors, community studies, and a range of applications where knowledge is applied to real world activities. Many of the workplace competencies identified above can be embedded in each activity (e.g. developing initiative, cooperation, groupwork, peer training, evaluation, communication, reasoning, problem-solving, decision-making information, planning. learning skills, and multicultural skills). And students can generate authentic ideas, products, artistic performances, and problem solutions that can be assessed directly for quality rather than assuming that examination scores will be adequate assessment instruments

The Accelerated Schools Project places great weight on a transformation process at each school site that encourages reflection and ideas by the teachers, students, and parents who must engage in change. The process is neither mechanical nor automatic, but requires the building of school communities dedicated to new goals and transformation. The process provides guidelines and tools for transformation and benchmarks to be used in assessment. It also requires a trained

[29] The evolution of the project is documented in H. M. Levin, "Accelerated Schools: A Decade of Evolution," In A. Hargreaves, A. Lieberman, M. Fullan, & D. Hopkins, eds., International Handbook of Educational Change, Part Two (Boston: Kluwer Academic Publishers, 1998). Evaluation results have been strong in terms of increased student achievement, parental participation, student attendance, and the establishment of gifted and talented approaches. For example, a recent evaluation of six schools in Memphis, Tennessee found that over three years, students had progressed from about the bottom third of students in reading achievement to the top third. See Steven M. Ross and others, Two and Three Year Achievement Results on the Tennessee Value-Added Assessment System for Restructuring Schools In Memphis (Memphis: University of Memphis, 1999). Implementation of the model has been a challenge as it requires substantial changes in practices.

[30] Powerful learning refers to a pedagogical strategy in which curriculum, instructional approaches, and school context (organization, climate, and resources) are integrated around enrichment approaches, those used in traditional gifted and talented programs. See W. Hopfenberg, H. M. Levin, and others (1993) The Accelerated Schools Resource Guide (San Francisco: Jossey-Bass), pp. 159-280. Also see the analysis of the components of powerful learning on www.acceleratedschools.net.

coach who will work with the school patiently and support the change process and will assist the school to trouble-shoot problems as they arise.

The Accelerated Schools Project was established initially to address the needs of students in at-risk situations, those with low levels of family income and parental education as well as marginalized immigrants and racial minorities. Although its success has been extended to schools with students from middle-class families, its predominant commitment is to those who need the most attention, at-risk populations. Recent research on gifted and talented students is highly supportive of the benefits of using academic enrichment for all students.[31] However, what we are calling for is a dramatic shift in the culture of the school so that it values such students as worthy and capable of great learning.[32] This means creating a school which is much more democratic in character and in which staff (with the participation of parents and students) undertakes planning, problem-solving, cooperation, assessment, and many of the other behaviors required of high-participation and high-productivity workplaces.

The Accelerated Schools Process

The Accelerated Schools Project has the overall purpose of creating the best schools for all children so that every child has the opportunity to succeed as a creative, critical, and productive member of our societies. It represents a philosophy and a process for transforming conventional schools into schools where powerful learning experiences are daily occurrences for all members of a school community. The philosophy of the Accelerated schools Model encompasses an overall goal, three principles, certain values, and a theory about powerful

[31] See, for example, J. S. Renzulli, "The Definition of High-End Learning," available at www.gifted.uconn.edu Renzulli is the Director of the National Research Center on the Gifted and Talented at the University of Connecticut. Also, see C. Finnan and J. D. Swanson, Accelerating the Learning of All Students (Boulder, CO: Westview Press, 2000) for a comprehensive approach to educational acceleration.

[32] A brief exposition of school culture and both obstacles and strategies to cultural change are found in C. Finnan and H. M. Levin, "Changing School Cultures," In H. Altrichter and J. Elliott, eds. Images of Educational Change (Philadelphia: Open University Press, 2000), pp. 87-99.

learning. The process of the Accelerated schools Model is a systematic set of practices for "getting from here to there"—from conventional schools to accelerated ones.

- **Living Principles**

Accelerated Schools are built on the active practice of three central principles:

(1) Unity of purpose refers to an active collaboration among parents, teachers, students, support staff, administrators, and the local community toward setting and achieving a common set of goals for the school. These shared goals and values become the focal point of everyone's efforts.

Clearly, a central element of the unity of purpose involves working to transform the school into an accelerated one that will make students academically able at an early date so that they can fully benefit from their further schooling experiences and adult opportunities. The all-inclusive process of defining a common purpose is extremely important in and of itself. By including all members of an educational community from the start in the planning and design, the implementation, and the evaluations of educational programs, schools can ensure more cohesive educational efforts and a greater commitment to those efforts. Unity of purpose stands in contrast to the rigidity of many national educational systems that provide little scope of discretion at the local level to set the direction of schools. However, unity of purpose must also be accompanied by the power to make decisions that will support the purpose of the school, within the broad limits established by the government on curriculum and school policy.

(2) Empowerment coupled with responsibility refers to the ability of the participants of a school community in both the school and at home to make important educational decisions, take responsibility for implementing those decisions, and take responsibility for the outcomes of those decisions. The purpose of this principle is to break the present stalemate among administrators,

teachers, parents, support staff, and students in which the participants tend to blame each other as well as other factors "beyond their control" (e.g. the government) for the poor educational outcomes of students. Unless all of the major actors can be empowered to seek a common set of goals and influence the educational and social processes to realize those goals, it is unlikely that the desired improvements will take place or be sustained.

This shift from a central authority to the school requires the establishment of three sets of institutional changes that are usually not present. First, there must be an effective system of school governance that can involve and stimulate participation of all of the pertinent constituencies in an effective way. Second, since good decisions are informed-decisions, the school must adopt a method of problem-solving that addresses its challenges and provides appropriate decisions based upon a good base of information. Third, the school needs its own system of assessment to ascertain the consequences of its decisions. The development of all three of these is incorporated into the Accelerated Schools process.

(3) Building on strengths refers to utilizing all of the learning resources that students, parents, all school staff, and communities bring to the educational endeavor. In the quest to place blame for the lack of efficacy of schools in improving the education of students at-risk, it is easy to exaggerate weaknesses of the various participants and ignore strengths. Sadly, most teachers have more expertise in identifying the weaknesses of their students and what they don't know than looking for and identifying strengths. Accelerated School communities actively look for and build upon the strengths of all students, parents, teachers, support staff, administrators, the district and the local community as they implement the Accelerated schools process and develop powerful learning experiences.

Underlying the Accelerated principles and practices are a set of central values, beliefs, and attitudes, which are a basis for school development. When shared, they help create the culture for Accelerated School change. Equity, participation, communication, collaboration, community, reflection, experimentation, trust, risk-taking, and the school as the center of expertise are among the central values that orient all actions of an Accelerated school. Many of these values stem from the work of John Dewey.

But, especially central to building on student strengths is the powerful learning approach, which integrates curriculum, instruction, and school organization rather than viewing each dimension as independent. The conception of powerful learning is based on the premise that the educational approach that we offer to "gifted" children works well for all children. With this fact in mind, we must create situations where every school day encompasses the best things we know about learning.

Accelerated schools create powerful learning situations that motivate students to grow and succeed. In Accelerated Schools, students see meaning in their lessons and perceive connections between school activities and their real lives. They learn actively and in ways that build on their own strengths. Accelerated school communities work together to create powerful learning experiences which provide opportunities for all children to develop their natural talents and gifts and to apply them in creative ways towards problem-solving and decision-making, two key ingredients of workplaces in the information economy.

These learning experiences require higher order thinking, complex reasoning, and relevant content. In such situations, children actively discover the curriculum objectives, rather than passively going through textbooks and filling out worksheets. At the same time, this type of learning environment requires organization and support, so that adults are challenged to create a

safe environment for learning that extends far beyond the classroom into every aspect of the school, home, and community. If we think about our own powerful learning experiences and what made those experiences so powerful we will come up with some similar themes

Implementation[33]

In order to truly function as Accelerated Schools, school communities need to work towards a unity of purpose, to make responsible decisions, and to build on strengths. For these reasons, the Accelerated Schools Project has developed a systematic process which is designed to establish for the school a unified purpose, shared decision-making authority and responsibility, and a capacity to build on the many strengths unique to each school site.

A school community can initiate the Accelerated schools process in a set of interrelated processes. The following paragraphs provide a brief picture of the steps in the process.

- ***Stock-Taking***

First, the school takes stock of the "here", i.e., where the school is at the onset of the change process. The entire school gathers quantitative and qualitative information on the history of the school; data on students, staff, and school facilities; information on the community and cultures of students and their parents; a description of curricular and instructional practices; analysis of the quality of students work; information on the attitudes and beliefs of school members; particular strengths of the school; and data on attendance, disaggregated test scores, and other measures of student performance. The process of collecting, analyzing, and discussing baseline information provides a useful record of the school's status at the beginning of the transformation process against which we can measure progress over time. All members of the

[33] This brief space is not adequate to provide all of the details of the theories and process behind Accelerated Schools. Readers should refer to the works in footnote 25 and H. M. Levin, "Accelerated Schools After Eight Years," In L. Schauble & R. Glaser, Eds., Innovations in Learning (Mahwah, NJ: Lawrence Erlbaum Associates, 1996). The Escuela Nueva has many similar principles, although it focuses more on basic skills and resources.

school community participate in setting out research questions, gathering data, and analyzing the data. Taking stock fosters a sense of ownership of the process and begins to build unity of purpose in the school.

- ***Forging A Vision***

During the vision process, the school community begins to forge a desired picture of the school that will become the focus for change. Again, the entire school community—including teachers, support staff, principal, vice principals, parents, central office administrators, the community, and, most importantly, students—should engage in creating a vision. In forging a vision, all adult parties think about the kind of school they would want for their own children. The students think about characteristics of the dream school and what they want for themselves in the future. It is crucial for all parties who will be both involved in and affected by the planning, implementation, and/or evaluation of educational programs to be included in this process. The elements of the visions of the different parties are brought together into a comprehensive aspiration. The all-inclusive nature of defining a vision results in ownership of a common set of goals and long-term commitment to achieving them. The development of the vision as part of an on-going process helps to create a vision that is a living, breathing document rather than just a collection of words.

- ***Comparing Vision to Present Situation***

Next, the school community compares the taking stock information with the vision in order to become aware of the areas in which their current situation falls short of their vision. The school community compiles and synthesizes all of the differences between the present situation and the future vision. They may identify a very large number of challenges, but together they set three to five initial priorities, which will become the immediate, primary focus of the school.

After setting priorities, the school establishes its governance structures that focus on participatory decision-making. All staff and representative students and parents select one of the priority areas on which to work. These priority groups become cadres or small task forces that use the *Inquiry Process* to address their challenges. Representatives from the cadres, administrators, and other representatives from areas such as departments, grade levels, the student body, parents, etc. form the steering committee which serves as a clearinghouse for decision-making and communication. Decisions are made by the school community-as-a-whole.

- ***Inquiry Decision-making***

The Inquiry Process is the method used by all members of the school community, whether in cadres, departments, or as individuals to move the school toward the vision and Accelerated practices throughout the school. Through the Inquiry Process, teachers, administrators, and parents identify and define educational challenges, look for alternative solutions, and implement and evaluate those solutions. One full cycle of the process can take up to a full school year because it entails a wide range of issues which touch upon all facets of the school—on culture as well as pedagogical practices.

The Inquiry Process provides schools with the opportunity to examine challenges in an in-depth manner in contrast to the traditional superficial search for solutions. Inquiry also encourages the school community to produce knowledge as well as to transmit it, thus building on the many strengths at the school site. In addition, Inquiry empowers those at the school site to make the changes they know are best for students. It is important to note that Inquiry may lead different schools in very different directions since each school has different challenges, strengths, and visions, but all schools will still fall within the guidelines set out by the government.

- ***Assessing Progress***

On a regular basis, the Accelerated Schools communities examine their practices, student experiences, and school climate to see if it meets the standards that they would set for their own children. The overall philosophy of assessment is based upon the premise that if the school is not good enough for the children of staff, it is not good enough for any child. This means that the staff must work together to create for all children in the school the experiences that they desire for their own children.

Progress is assessed in Accelerated Schools by a system that focuses on both school and student progress.[34] Schools work to align their assessment practices with goals of the Accelerated Schools philosophy and process. School communities also review their action plans and the implementation process to make sure that decisions make their way into school practices. The Project has developed an Internal Assessment Toolkit, which is available on its website: <www.acceleratedschools.net>. This Toolkit provides guidance to school communities for assessing their implementation of an Accelerated school with particular emphasis on measuring that progress against established benchmarks. In addition, Accelerated Schools evaluate such school outcomes as levels of student and family participation in school activities. Accelerated Schools also assess student performance to assure that students are successful in their learning and are leaving the school with the necessary skills and accomplishments reflected in their vision. Periodic evaluation on wide-spectrum, standardized achievement tests as well as on tailored assessments created by school staff for each curriculum strand are essential ingredients. These evaluations emphasize the students' acquisition of their higher-order thinking and reasoning skills in core curricular areas. Unfortunately, assessment instruments that are

presently available are not suitable for these purposes. Accordingly, this dimension must draw on major developmental efforts at both the national level and on fledgling efforts at individual Accelerated Schools and in the whole Accelerated Schools Project.[35]

- ***Capacity Building***

Although we have used different training models, we have concluded that one is superior for our purposes.[36] The Project prepares an external coach (at least 25% time), the principal, and an internal facilitator (at least 25% time) to work together as a team in transforming the school. Accordingly, we have established formal training workshops for Accelerated School coaches, principals, and school facilitators at regional centers that can be used to provide the knowledge and skills required for establishing Accelerated Schools. These workshops emphasize an understanding of Accelerated practices that will be implemented at designated pilot school sites following the training.

In addition to the more formal training requirements, coaches are at the school site on a weekly basis to build capacity and trouble-shoot. Further, all coaches are mentored by staff from regional centers with regular communications and mentorship visits to school sites. Through this model, we are attempting to ensure that all schools have accessibility to trained coaches and facilitators who can provide the training, follow-up, and guidance at the school site that we have found necessary. There is also a National Conference for the Accelerated Schools Project that draws participants, both nationally and internationally, for sharing experiences and ideas at workshops and through major presentations and informal discussions..

Research and Creativity Centers--A Next Step

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[34] Also, see the recent volumes of PREAL on educational evaluation, for example, B. Alvarez H. and M. Ruiz-Casares, Eds., Educacion Y Reforma Educativa: Opciones de Politica, Informe Technico 3 (Washington, DC: Programa de Promocion de Reforma Educativa en America Latina, PREAL, 1997).

It is now time to build on what we have accomplished with Accelerated Schools to go to the next step for creating future workers and citizens for a world that is increasingly influenced by information technologies and globalization. The next phase will be to establish Research and Creativity Centers at schools sites. The idea behind such centers is to prepare all students for a productive future through engaging them in research and applied projects from their earliest days in school and extending these activities through high school completion. The combination of Accelerated Schools with Research and Creativity Centers in Latin America and the Caribbean would represent a jump beyond simply improving traditional schools. If this were done successfully in Latin America and the Caribbean, this part of the world would be the leaders in preparing the young for the changes that have and will take place.

The Research and Creativity Center (RCC) would have a capacity for talent development in the fine and performing arts, community projects, sports and physical activities, and a special focus on academic growth through research projects. All children are curious. All have experiences that create wonderment. The RCC would provide experiences that would not only respond to the natural curiosity of children and answer their questions, but also would also provide the skills required for them to develop insights, answers, and solutions to problems. Even in the earliest grades a provision would be made for students to generate questions that they wish to answer. The research component of the RCC would enable students to carry out research both on topics of their own choosing and those assigned by the school. The center facility would comprise specially trained personnel as well as books, documents and access to the Internet and World-Wide-Web, but it would have an electronic file of both local experts, organized according to subject, as well as web addresses of more remote experts and sites that could be contacted.

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[35] A good source on performance assessment is G. Wiggins, Assessing Student Performance: Exploring the Purpose and Limits of Testing (San Francisco: Jossey-Bass, 1993).

Software for word processing, databases, spreadsheet analysis, database searches, statistical analyses, graphics, and presentations would be widely available.

Creativity would be enhanced by artistic experience in the fine and dramatic arts as well as music, and student would undertake projects individually and collaboratively in these areas as well. The RCC would be heavily based upon the availability and use of educational technology, and students would learn to use the technologies for both research projects and creative endeavors. All of the technological tools could be made available through a government-sponsored web-site, so that schools would not need to go to the expense of acquiring their own software.

Both regular classroom teachers and RCC experts would work to apply the skills taught in classrooms to creative, analytic, and physical activities that students pursued in the Discovery Center. This assumes that universities and Ministries of Education would launch new training programs to prepare RCC directors and to augment teacher training in the areas addressed by the RCC. Students would learn through interactive means rather than just memorization. Students would be provided with age-appropriate basic skills in research and creativity such as the use of different media for artistic expression; how to transform curiosity into researchable questions; how to design a method to answer such questions and identify the information that is needed; how to acquire that information and use it; how to engage in problem-solving; and how to make oral and written presentations of their research and problem-solving activities. In some cases students will identify their own areas of interest, and in other cases they will be assigned questions or problems that they will need to explore.

Some of the activities will incorporate research on community issues and require active community involvement such as addressing the housing challenge in Latin America. In this

[36] For details, see the reference in footnote 24.

case, students might be able to work on aesthetic and design matters as well as analyzing the high costs of housing and searching for solutions. Among the types of competencies that could be built into such projects would be the types of intelligences identified by Howard Gardner and Robert Sternberg.[37] In addition, many of the workplace competencies identified above could be embedded in each activity (e.g. developing initiative, cooperation, groupwork, peer training, evaluation, communication, reasoning, problem-solving, decision-making information, planning. learning skills, and multicultural skills). And students could generate authentic ideas, products, artistic performances, and problem solutions that could be evaluated directly for quality rather than assuming that examination scores will be adequate assessment instruments.

Even at the earliest grades, students could be introduced to the RCC and asked to formulate questions based upon their natural curiosity. RCC specialists and classroom teachers will be trained to assist students in learning how to answer those questions. In subsequent grades students can be provided with an increasingly sophisticated variety of analytic, problem-solving, research, and artistic skills that they will develop and apply to both real world situations and more abstract problems. Obviously, as the students mature in the educational system, their sophistication will increase and the expectations of accomplishment will increase. The RCC approach also provides an opportunity for closer university-school relations as students at the university can team with the older students in doing research on particular problems and issues.

I believe that the Accelerated Schools Process should be in place before the RCC to insure that the school has unity of purpose, empowerment, and powerful learning. Students need to have basic skills as well as more advanced ones in conjunction with their activities in the RCC. But, consider the implications for Latin American and Caribbean countries. Instead of just focusing on doing better, more efficiently, and more equitably what schools have done

[37] H. Gardner, Frames of Mind (New York: Basic Books, 1983). R. J. Sternberg, Successful Intelligence, op. cit.

historically, Accelerated Schools with RCC's will take a leap into the future. Each school that adopts the ASP process will be able to adapt the approach to its unique reality and fine-tune the details.

Future Directions

In my view, the feasibility of an idea must always be tested first before scaling up to a higher level. In that testing, one learns what works and what needs to be modified. One discovers both unexpected sources of support as well as bottlenecks that inhibit development. Accordingly, I would recommend at this point the development of pilot schools that become part of an international network in sharing their progress and challenges and the solutions to the problems that they face. This will require training and implementation at these pilot sites of the Accelerated Schools process as well as the beginning of planning and building of RCC's. Careful assessment must be carried out on implementation and school progress as well as student consequences. It is only by learning from this pilot phase that an informed decision can be made whether to move forward to greater diffusion and how to provide adaptation to national and local cultures and conditions. We must also bear in mind that expansion will require building capacity of teacher training institutions to prepare teachers in a new way as well as for existing schools and school personnel to be engaged in a process of change. Most teachers have never been exposed to powerful ways of teaching and learning and need intensive training and practice to work in this way.[38] This type of expansion is never easy, but it represents an important path to the future health of nations.

[38] See the section on powerful learning on website www.acceleratedschools.net. Also, the Accelerated Schools Project has developed such intensive training through Powerful Learning Laboratories.