

# PROSPECTS

quarterly review of  
comparative education

ISSUE NUMBER ONE HUNDRED AND TWO

## OPEN FILE

NEW  
TECHNOLOGIES  
IN EDUCATION

I



INTERNATIONAL BUREAU OF EDUCATION

Vol. XXVII, no. 2, June 1997

POWER, HUSÉN, BHOLA, BURNETT/PATRINOS AND McGINN  
ON THE DELORS AND WORLD BANK REPORTS

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# PROSPECTS

quarterly review of comparative education

Editor: Juan Carlos Tedesco

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# EDITORIAL

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This issue of *Prospects* has a special structure, different from the one we usually adopt for this review. Firstly, in the Viewpoints/Controversies section, we publish five studies on two very important reports on education at the international level: the report to UNESCO by the International Commission on Education for the Twenty-first Century (the Delors Report); and the Education Sector document of the World Bank.

In recent years, different international organizations have adopted the habit of preparing and publishing important documents on policy positions, which are intended to play—in some cases—a significant role in the definition of national strategies. The objectives set and the methods employed in the preparation of the reports prepared by the Delors Commission and the World Bank were completely different. For instance, while the World Bank document was prepared by its own technical staff, the Commission Report was the outcome of a lengthy process of consultation and dialogue with different members of the international academic and political communities. Furthermore, whereas the World Bank document was basically intended to define priorities on investments and loans granted to developing countries, the Commission Report set out to adopt a wide vision both from the conceptual and the political points of view. Any comparison, therefore, is neither possible nor appropriate. Nevertheless, analysing these two documents together could be useful in familiarizing ourselves with the possibilities and limitations of international visions of education.

A second part of this issue is dedicated to the relationship between new information technologies and education. The analysis of this theme will be pursued in the next issue of *Prospects* in which we will publish papers presented at UNESCO's second International Congress on Education and Informatics: Educational Policies and New Technologies, Moscow, 1–5 July 1996. In this first part, we include two articles of a general nature and three case studies. The two general articles, written by Pierre Lévy and Goéry Delacôte, analyse the potential of the new technologies from the point of view of their impact on the development of intelligence and on the learning process. The case studies refer particularly to the use of new technologies

in the construction of communication networks between people and educational establishments. The basic objective of this analysis, which will cover two issues of this review, is to demonstrate different visions of the question, both from the theoretical point of view and from that of socio-economic and cultural contexts. This vision allows us to appreciate the complexity of problems and, more specifically, gives us the possibility of situating the discussion on the impact of new information technologies beyond the purely technocratic arguments put forward by both the protagonists and the most critical detractors.

This issue of *Prospects* is completed by an article by Inés Aguerrondo, which discusses one of the rather crucial questions concerning educational policies in developing countries—the relationship between educational costs and educational quality—and a study of one of the leading educators of the late sixteenth/early seventeenth century, Joseph Calasanz, which has allowed this review to resume its policy of publishing profiles of the most influential thinkers on education on a regular basis.

JUAN CARLOS TEDESCO

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**VIEWPOINTS/CONTROVERSIES**

**THE DELORS REPORT  
,  
AND THE  
WORLD BANK PAPER  
ON EDUCATION**

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# LEARNING: A MEANS OR AN END?

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## A LOOK AT THE DELORS REPORT

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### AND ITS IMPLICATIONS

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### FOR EDUCATIONAL RENEWAL

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*Colin N. Power*

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To evoke the year 2000 is to evoke the notion of a transition fraught with perils and filled with opportunity: it challenges us to re-examine what is of fundamental importance for peace and human development, and to reflect on how we have inscribed them into national, regional and international policies and programmes, public and private ethics, and the search for knowledge.

Given its intellectual and ethical mission, UNESCO is seeking to promote reflection in its special areas of responsibility on the eve of this century, and has participated in all the major initiatives of the United Nations System laying the groundwork for international co-operation as we make the transition beyond the year 2000. It is, of course, impossible to deal adequately with all of the initiatives of UNESCO in education in one short article. Therefore, I will focus on the Report of the International Commission on Education for the Twenty-first Century.<sup>1</sup>

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*Original language: English*

*Colin N. Power (Australia)*

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## The Delors Report

This document, specific to UNESCO, is the central subject of this article. At the beginning of 1993, the Director-General of UNESCO felt that it was time to take stock of contemporary views and thinking in education and to receive views on what sort of vision of education would be needed to help humankind move successfully, hopefully, into the next century. This was the task entrusted to the International Commission on Education for the Twenty-first Century, chaired by Jacques Delors (then President of the European Commission) and composed of fifteen prominent persons from a variety of backgrounds and regions. It must be emphasized that the Director-General and I, from the outset, insisted that this must be an independent Commission—it is a report *to* UNESCO, not *of* UNESCO and is intended to provoke reflection, debate and action within Member States and UNESCO itself. In this issue of *Prospects*, Torsten Husén presents the work of the Commission as viewed by one of the world's leading experts in international education. In order to avoid duplication, I will focus more on what I believe the report means for UNESCO and its agenda for 'education of world citizens'.

The report of the Commission, *Learning: the treasure within*, differs quite strongly from most other reports on education and human development: it is not a blueprint for educational reform but a framework for reflection and debate about the choices which must be made in formulating policies. The Commission views choices about education as stemming ultimately from choices about the types of society that we wish to live in. Whereas many contemporary reform agendas seem to be driven, explicitly or implicitly, by what market economists perceive to be the ideal society, the report of the Commission is more closely aligned with the intellectual and humanistic ethical principles which inspired the founders of the United Nations and UNESCO. As such, its analyses of issues and recommendations are more profoundly humanistic and less market driven than those of the World Bank or the Organisation for Economic Co-operation and Development.

The Commission's report takes us back to the fundamental purposes of education. The report's title, *Learning: the treasure within*, reminds us of the importance of learning throughout life, about the need to develop both a vision and a practice of education that goes beyond schooling. The treasure is learning itself, that remarkable asset possessed by every human and every culture which needs to be tilled and used wisely. It is the knowledge, values and wisdom accumulated, the inheritance our forebears have left us which we must not sell. Knowledge and minds are not commodities, not just 'human resources' to be developed, exploited and then cast aside, but treasures to be cultivated to improve the quality of life of both individuals and societies.

The Delors Report begins by analyzing some of the major trends that will bear upon the evolution of societies and that will challenge education to help human beings master and direct the course of change. It proposes a vision of the learning process that is built on four pillars: learning to know, learning to do, learning to be, and learning to live together. This expands the purpose and process of education beyond its immediate functionality, ascribing to it a major contribution in the formation of the whole human being. This is an

ambitious vision, but undoubtedly a truly noble one that adheres firmly to the same ideals as those set out in the Constitution of UNESCO.

The report was delivered to UNESCO and published in English and French in April 1996. It is on its way to becoming the all-time most successful publication of UNESCO in the field of education: at the time of writing (March 1997) more than twenty-five language versions are in production and more are expected. It has already made, and undoubtedly will continue to make, a strong contribution to invigorating not only thinking on educational reform and practice, but also a broader debate about the relative weights of economic and social progress, and ways in which those relationships can be made more complementary. It emphatically links education policy to public policy in general, stressing the role of education without burdening it with all the ills of society or all the responsibility for curing them. It makes it clear that the future of society depends on human beings living together, on each person participating in the surrounding community as more than a mere economic agent. In that sense, education must be a process of learning about, preparing for and participating in democracy.

The Commission places its reflection on education within the broad context of the challenges posed to humanity by unresolved tensions central to contemporary societies. These tensions—between the global and the local, the universal and the individual, the traditional and the modern, long-term and short-term considerations, competition and equality of opportunity, the unlimited expansion of knowledge and the limited capacity of human beings to assimilate it, and, finally, the spiritual and the material—are not new, but they frame many of the most acute problems of our time. The challenges of globalization, of human development, and of social cohesion can be met only in a context in which the principal societal tensions are, at the very least, under control. Although the Commission did not attempt to project future trends, it did feel it could extrapolate from today's situation to look at the prevailing forces that education must not only respond to but, to some extent, master.

In a recent report of the Kettering Foundation entitled 'Is there a public for public schools?', Matthews argues that the community and the public are slipping away from public schools.<sup>2</sup> News stories about education are framed largely around controversies about financing, equity, quality and effectiveness—punctuated with dramatic accounts of drugs and violence. This report suggests that most citizens find the discussions of reform too technical to be coherent and too far removed from their concerns to be relevant. It goes on to argue that there must be a public before there are good public schools. In other words, in mega-cities, in particular, reconstituting public life in our communities and strengthening our ties as citizens must precede and pave the way for sustainable school improvement. For the Kettering Foundation, mandates linking schools to communities can only come from the communities themselves. In essence, ministers and mayors must be concerned about rebuilding the relationship between the community and schools by starting with the building of the community, and that means providing opportunities and support for building communities and support structures within large cities.

For its part, the Delors Report points to the tension between the global and the local: in order to participate in a global society we must understand our roots. We must be capable of living together in the communities to which we naturally belong, in harmony with

the neighbours with whom we may or may not share a common language, history, religion or world-view. Globalization brings with it the risk of diminishing the rich diversity among individuals, culture and traditions.

Increasing globalization on the one hand forces us to accommodate change, and may call into question some of our key institutions. For example, Paul Kennedy, in his book *Preparing for the Twenty-first century*, suggests:

Global changes call into question the usefulness of the nation-state itself—for some problems it is too large to operate effectively, for others it is too small. In consequence, there are pressures for a relocation of authority, upward and downward, creating structures which might better respond to today's and tomorrow's forces for change.<sup>3</sup>

Thus, we see the increased role of international and regional institutions and corporations on the one hand, and the increasing importance of the city and the community in the provision of essential social services. The relocation of authority downward carries with it both strengths, in terms of improved delivery and relevance, but also the risk of fragmentation and disintegration. So, for the Delors Commission, the tension between the need to protect cultural identity and the need to systematically educate for social cohesion and tolerance is one of the greatest challenges we must face in education for the future.

Another threat featuring in the thinking of the Commission and afflicting many countries is that of losing sight of the roots of our civilization. Some of the more successful emerging economies have learned what the West seems to be forgetting: the value of a general, quality education for all. We need an imaginative, innovative and human programme in the sense developed within the Report, and one arrived at through a broad process of consultation involving all actors in education at the national and local levels, and which responds to emerging global opportunities and threats.

## The four pillars of education

The Delors Report, then, wishes to reposition our thinking on education, to base it on four pillars: *learning to know*, *learning to do*, *learning to be*, *learning to live together*. Education systems are quite strongly focused on *learning to know*. They cope more or less adequately with *learning to do*. They may or may not pay lip-service to *learning to be* or *learning to live together* in the form of civic education, artistic and sports education, and through attachments to the curriculum. But it is not an exaggeration to say that there is hardly an education system in the world that rewards achievements in the latter two areas by testing or evaluating the progress made by individuals or rewarding individuals or teachers for focusing on the latter two pillars.

*Learning to know* today means more than acquiring a specific body of knowledge, but also an approach to learning itself, while *learning to do* means more than just skills: the application of knowledge in new situations, and the linking of learning with doing throughout life. *Learning to live together* means more than tolerating otherness. It means wishing to understand others, to live together in mutual respect. The Universal Declaration of Human Rights (10 December 1948) states in Article 26 that:

Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms. It shall promote understanding, tolerance and friendship among all nations, racial or religious groups.

If we wish, through education, to learn to live together, we must reflect on the way in which history, geography, languages and philosophy are taught. We must examine the way in which the educational establishments themselves function and interact with the community. We must be aware of the importance of the example of teachers, who function as powerful role models in the transmission of attitudes and values. Mostly, though, we must understand that values are *caught, not taught*.

The way in which each education system operates, its relationship with the surrounding community and the treatment afforded to students are more influential teaching tools about attitudes than are the contents of a specific course. The forty-fourth session of the International Conference on Education endorsed a Declaration and Integrated Framework for Action on Education for Peace, Human Rights and Democracy, and a significant part of UNESCO's programme and budget is devoted to 'a culture of peace' in and through all levels and types of education. UNESCO is seeking to create a culture of peace through international normative instruments (such as the 1974 Recommendation and the Convention on Discrimination in Education); by establishing and supporting networks such as the Associated Schools Project, the UNITWIN networks and chairs on peace, human rights and democracy, and the International Textbook Research Network; the development of guidelines for curricula and teaching materials, teachers' handbooks, projects (such as Linguapax); promoting pedagogical research and innovations relevant to education for peace, human rights and democracy; and, sadly, assisting countries in the reconstruction of education systems during and in the aftermath of conflicts, as well as schools struggling to cope with problems of increasing violence. However, it must be admitted that we have much to learn about how education systems and institutions can contribute to 'learning to live together' in different situations. Thus, UNESCO welcomes the establishment of research and development networks, such as the Asian and Pacific Network for International Education and Values Education.

The fourth pillar, *learning to be*, is the title and principal theme of the Commission that reported to UNESCO some twenty-five years ago, under the chairmanship of Edgar Faure. This noble concept is just as valid today as when it was coined: 'learning to be' means *encouraging the fullest development of the creative potential of each individual, in all its richness and complexity*. One of the Commissioners spoke of education as an inner journey. This is an apt and necessary description of what is, and must remain, one of the central pillars of the type of education needed to prepare us for the twenty-first century.

And yet, it is during adolescence that great possibilities are available for awakening the potential within each of us for learning, for developing new talents and for becoming learners. When asked about the qualities they seek in young people entering the world of work, employers most often speak of the capacity to adapt, the ability to work with others, and other qualities that are only indirectly related to the overt content of most school curricula. Curricula generally pay only lip-service to these qualities, focusing on more easily-evaluated cognitive achievements. In the view of the Commission, in-depth



reflection is needed on how each education system can be built on these four pillars, and how the curricula, the teachers and the management of the system need to be adapted to meet these needs.

## **The people who make or break learning**

The report makes it clear how important it is to remember that teachers are central to learning. This obvious—but often ignored—fact is at the root of much misunderstanding about the various inadequacies of education and of educational reform. It is extremely difficult to initiate educational reform or to improve the quality of education in a country that possesses inadequately trained and demoralized teachers. A reform that attempts to change education without the full understanding and support of the teachers in the classroom will be a failure—more often than not a costly one. And yet, teachers are often given short shrift in the design and implementation of reform. When reforms go wrong, more often than not, teachers are assigned a substantial part of the blame.

Aside from the debate about the contribution of communications technology to learning, by expanding access and refining the educational process, the human factor cannot be removed from education.

‘Is there anyone who, when having at some point in their lives had major decisions to take, was not at least to some extent influenced by what they learned under the guidance of a teacher?’ (p. 145). Thus, rather than viewing teachers as troublesome, low-performing elements in the production system, we must begin to see them also as part of a system of learning throughout life, as citizens entitled to learning opportunities and responsible, along with the rest of society, for contributing to an education system that can help us all learn to live together.

## **In defence of public education**

‘The improvement of education [. . .] requires policy-makers to face up squarely to their responsibilities. They cannot leave it to market forces or to some kind of self-regulation to put things right when they go wrong’ (p. 31). Surely, we must accept that governments cannot abdicate their responsibilities for regulating the system, which means ensuring equal access to education, maintaining equity and quality throughout compulsory schooling, providing second-chance opportunities for those who do not succeed in initial education, and making information available enabling citizens to make informed choices about the kinds of education they may seek and receive.

## **A look at the recommendations**

Given the fact that the Commission could not have developed specific recommendations that were applicable for all, or even the majority, of situations, it attempted to focus on some general principles that could help nourish the debate on educational reform in particular circumstances. A few can be summarized here:

## DIVERSIFICATION OF EDUCATION

The report recommends diversifying paths through the education system—formal and non-formal. This is an essential task that will provide the means for each individual to find her or his own way. This implies diversity, both in content and in the use of time. It should be the goal of each education system to provide a more varied offering in terms of curricula and a greater choice in terms of the time-frame for each individual to move through education, and particularly secondary education. The length of courses, the length of time spent in the school system, and the possibility of alternating between education and work are all features of greater diversification. Technical and vocational education need to be linked, as far as is possible, to the actual labour market, with the recruitment of persons from outside the teaching profession for specific tasks. The training of technical personnel (health, agricultural or industrial) should not preclude the provision of an adequate general education, or the possibility of returning to formal education at a later stage in life. It is the education system itself, with its methods of accreditation, that is the first guarantor of the possibility of alternating periods of study with periods of work. It is the education system that can give an impetus to alternative paths, by providing for bridges between various kinds of study and by encouraging partnerships with other types of learning environments.

## LEARNING RESPECT FOR DIVERSITY

This principle would hardly need repeating if it were not for the fact that it has barely gone beyond the status of a slogan in some parts of the world. Learning history, learning the history of science, learning languages and being exposed to a curriculum with a strongly international and multi-cultural flavour are vital tools in building one of the pillars of learning: *learning to live together*. Although what is commonly known as social studies or civic education are useful, if they are divorced from the rest of the curriculum they are not likely to have a sufficient impact on attitudes. A review of the content of all subjects, as well as the organization of the school and the classroom itself, will be necessary.

## BRIDGING THE GAP BETWEEN TRADITION AND MODERNITY

Here, education finds itself caught on the horns of an eternal dilemma. Knowing the culture and the traditions from which one comes is essential. Yet, no one can be imprisoned in the past: the world is shrinking, and the education system needs to help young people understand from whence they come in order to know and to understand where they are going. The use of modern techniques of communication—radio, television, computers and the Internet—will be essential, as will understanding how they are used by others. Consequently, along with learning at the primary level in the mother-tongue, and teaching in a national language, the report underlines the importance of learning languages of international communication. Obviously, schools will also have to make more use of technology, both to enhance the educational processes and to prepare young people to live in a technological world. The burden on teachers will be heavy in this

area. They will need opportunities for further training if the school system is not to lag behind.

#### FLEXIBLE MANAGEMENT

I quote here from the report: 'The practice of negotiation and collaboration where school management and school life in general are concerned is in itself a democratic learning process. The autonomy of educational institutions also strongly encourages innovation' (p. 159). Decentralization is not a panacea. The State cannot back away from its responsibilities for ensuring equal access and equal opportunity. However, encouraging broader participation by parents and other stakeholders in decision-making can contribute to several aims at once: greater democracy in practice and the learning of democratic processes by pupils; diversification that can correspond more closely to local needs and may even lead to greater links between the various levels of the education system.

#### EDUCATIONAL TIME CREDIT

The report recommends paying attention to a proposal that could help move towards making effective the possibility of learning throughout life. This proposal is the creation of a study-time entitlement that would commence with the end of compulsory schooling and could be 'banked' to be drawn on for continuing education or other learning during adult life. Such a scheme, which could also be linked to the accumulation of capital towards study—idealistic as it may sound—is worth examining for its potential to combat inequality of opportunity and for its ability to enshrine the second and third chance for all those who do not take a linear path through the education system. In my view, this proposal reflects the concern of the Commission for equality and for preserving the right to education throughout life: it is not a voucher to promote an educational free-market, but a passport to life.

#### A REVIEW OF THE ROLES OF TEACHERS

Teachers need greatly increased support from many quarters. They must also expect to face new responsibilities and to embrace the concept of learning throughout life in their own personal relationship with learning. In order to meet the expectations placed on it, any education system needs excellent teachers: well-trained, dedicated and respected. Teachers will have to accept greater participation by non-professionals in the process of teaching and management of education. Such a broadening of educational roles can benefit everyone, but must be negotiated with teachers' organizations and with communities. The principle of learning throughout life should not be an abstract concept applicable to the rest of society, but needs to be adopted by the teaching profession and accompanied by the corresponding opportunities for further learning. Particular importance has been attached by UNESCO to fostering the enabling mechanisms needed to help define these new roles and to promote policies and specific programmes and training packages to enable teachers to assume them. For example, the opportunities and challenges to teach-

ing posed by the impact of new information technologies were the focus of the second International Congress on Education and Informatics (Moscow, July 1996), while the forty-fifth session of the International Conference on Education dealt with 'Strengthening the role of teachers in a changing world' (Geneva, October 1996).

#### THE CHALLENGE OF NEW INFORMATION TECHNOLOGIES (NITs)

The Delors Commission concluded that 'these technologies are in the process of accomplishing nothing short of a revolution before our very eyes, one that is affecting activities connected with production and work just as much as those connected with education and training' (p. 169–70). For the Commission, the issue goes beyond the simple use of NITs for teaching purposes: 'it calls for a general consideration of how knowledge will be accessed in tomorrow's world' (p. 169). The NITs are creating a cultural and educational environment potentially capable of exponentially increasing and diversifying sources of certain types of information and learning—but, one must add, not all learners, not for all types of information and not for all cultures and languages. The ultimate question is then: what—for any group of learners, goal, time or context—is the optimal combination of human teachers and communication technology needed to actualize our goal of lifelong education for all?

In the foreseeable future, how will the new information technologies affect the ways in which information is accessed, stored and processed by education systems, teachers and learners? In what ways might management, teaching and learning in conventional face-to-face settings be transformed by NITs? To what extent can NITs facilitate the expansion and improvement of distance education and open learning systems? Who is likely to benefit from the increased use of the technologies in education and in society? Who and what may suffer? How can we avoid the potential dangers inherent in the misuse or overuse of NITs: the twin threats of cultural domination and of increased inequality?

We are moving towards an information society in which the new technologies will progressively become cheaper and more widely used, and thus many new options for education systems and learning will be developed, creating new opportunities and challenges to formal education, precipitating changes in its role and function. As with other technology-driven innovations, periods of euphoria about the NITs will alternate with periods of hesitation, as applications are introduced but fall short of expectations. Ultimately, we will begin to discover that we need both competent, well-trained teachers and appropriate, well-designed software.

As in the past, we will find that the new technologies are a useful tool for facilitating learning for some students and some objectives, but not all. The NITs will be reasonably effective in helping most students to acquire information—to help them 'to learn to know' and to some extent 'to do' (open technical and vocational education systems). But there is a big difference between 'surfing the net' and the systematic and balanced development of young minds and lives. There is no substitute for a curriculum. Most users of the Internet 'surf' looking for interesting information, just as many 'zap' TV channels. Educationally sound curricula and good teachers will still be needed to do what machines cannot do: to guide learners through the oceans of information and packages now avail-

able; to promote the development of understanding and creativity in key subject areas; and, above all, to facilitate 'learning to be' and 'learning to live together'.

The greatest challenges facing humanity in the future stem not from the lack of information, but from the lack of individual and collective socio-cultural, emotional and moral development. If we are wise, we will train our teachers to make better use of the new technologies in order to convey information, giving them more time to focus on the deeper, human and humane purposes of education, to create learning environments that encourage students to question, reflect, find patterns and interpret the information they find in relation to their ideas, interests and needs. As Internet and DBS (direct broadcast satellite systems) begin to be deployed on a massive scale, distance education and open learning systems will become more affordable and accessible to all, and the necessary technological tools to use them will become more commonplace in educational institutions, libraries, etc. For those who are fluent in English or one or two other major international languages (e.g. French or Spanish) and have easy access to the technology, 'lifelong learning for all' and 'learning without frontiers' will no longer be mere slogans.

However, inequalities in access to education, information and the newest technologies, and thus to resources and power, will continue to increase within and between countries. One of the biggest challenges then is how to use the technology to reduce rather than widen the gaps between rich and the poor, and to avoid further marginalization of minority cultures and languages. In preparing for an information society in a period of intense economic competition, educators must insist on policies and programmes which protect basic human rights, and respect linguistic and cultural identity, while promoting social cohesion. Equality of access to the knowledge and skills needed for participation in modern society, its communication systems and its technologies is essential for democracy and social cohesion. Those without such knowledge and access cannot influence decisions affecting their lives. As the Council of Europe report on *Education and the information society*<sup>4</sup> puts it:

There is a need to counteract the tendency for control to be exercised by information providers over information receivers. Information is, indeed, power, and those who control it can dominate, not to say manipulate, the information society. The challenge for education will be, more than ever, to overcome passive acceptance of information in favour of the active exercise of independent judgement (p. 12).

The problems of inequitable access to the information highways are compounded by the current dominance of English in the media and on Internet. The mass media and NITs pose a threat to society as a whole from the cultural domination of externally mediated messages. Small countries and minority languages are particularly vulnerable. However, whether the threats are cultural or economic, blind resistance to the introduction of NITs is as undesirable and impractical as uncritical acceptance. What is needed is a proactive response—one which seeks ways of using the advantages of the new technologies, in terms of cost and coverage, to 'reach the unreached' and to preserve endangered languages, as well as to promote the acquisition of lingua francas and intercultural dialogue.

The Delors Commission has therefore recommended the diversification and improvement of distance education through the use of new technologies in developing countries, and the strengthening of their infrastructures and capabilities in this area. In the developing world, it is the possibility of outreach and of economies of scale which is most immediately attractive, and thus most UNESCO projects are aimed at meeting the educational needs of large groups or audiences (e.g. distance teacher education in the nine largest developing countries; interactive radio for Lusophone African countries; satellite transmission to reach remote villages in China, Indonesia or India; dedicating part of the HISPASAT capacity for Spanish domestic communication in Latin American television networking). UNESCO's CD-ROMS and Internet services for teachers are, as far as we can make them, tri-lingual (English, French and Spanish).

The Report of the World Commission on Cultural Development<sup>5</sup> regards the airways and space as part of the 'global commons', a collective asset that belongs to all humankind, and suggests that the commercial interests using this space should contribute to the financing of a more plural media system—thus contributing to access, diversity and protection of endangered languages (some estimates suggest that up to 90% of languages in use today will become extinct in the course of the next century). Both the Commission and the 150th session of UNESCO's Executive Board expressed support for the principle of freedom of information, while at the same time expressing concern over the prevalence of violence and human degradation on the information superhighways. They call for UNESCO to serve as a clearing-house for developments and a forum for reflection and co-operation on such issues.

Formal education systems will no longer have a monopoly on information or the delivery of education, but teachers do have a vitally important human role to play in the future—a role which can be more durable as long as we can learn to use the new technologies to help teachers in their work, to help them to work with other teachers and new partners, and to liberate them from routine administrative and information-dissemination tasks. We must learn to share and work together, to push for what is educationally sound, to debunk myths about teachers and about NITs, to use them as collaborators in joint ventures, to invent new human/machine combinations in order to reach the unreached and to make education for all affordable. The NITs have created a global village in which injustice, inequity and poor quality programmes and teaching will become ever more transparent. We must learn to share the benefits of the new technology with all and for the benefit of all—or face an increasingly polarized and conflict-ridden world.

#### INTERNATIONAL CO-OPERATION

On this issue, the recommendations of the Commission include:

- A quarter of development aid should be devoted to the funding of education;
- Debt swaps should be encouraged in order to offset the adverse effect of adjustment policies and policies for the reduction of domestic and foreign deficits on educational spending;
- The gathering, at the international level, of data on national investment in education should be encouraged, in particular by the establishment of suitable indicators: on

the total amount of private funds, on investment by industry, on spending on non-formal education, etc.;

- A set of indicators should be developed for revealing the most serious dysfunctions of education systems, by cross-relating various quantitative and qualitative data, such as: level of spending on education, drop-out rates, disparities in access, inefficiency of different parts of the system, poor-quality teaching, teachers' status, etc.

## What next?

UNESCO will, over the next several years, work hard to carry forward some of the ideas and recommendations in the Delors Report, and to make the four pillars of learning central to its own vision and activities in the field of education. It has begun by making linkages between the conclusions of the Commission and the input to all its major conferences, and by launching a series of activities on the theme of 'learning to live together' that link closely with what has already been done in the past. It will put renewed emphasis on indicators of quality in education that take into account not only knowledge and know-how, but also creativity and contribution.

The report of the International Commission on Education for the Twenty-first Century is not a specialists' compendium of responses to specific situations. Nor is it a set of recipes to be applied. It is an attempt, by a group of people who are not in their majority from inside the educational profession, to provoke thought and reflection about the relationship between education and society. It attempts to make clear the need for a vision of society, developed through consultation and consensus, that should underpin educational reform. It adopts a resolutely humanist attitude, refusing a social determinism that would cast the fate of children once and for all during formal education with little chance of review. While it is concerned with the vital issues of educational practice in the classroom, of educational quality, of finance and governance, it is also a plea for keeping sight of the larger issues—about the choice of the kinds of societies we wish to propose for ourselves and for our children. UNESCO is privileged to have a report from an independent commission that has both reaffirmed and refreshed a profoundly humanistic vision of education, that makes a plea for giving each human being the opportunity for acquiring the tools for taking charge of her or his destiny, through the inner voyage that can and should lead each of us to discover the treasure within.

In the view of the Commission, education—and learning—is central to human activity and aspirations. Much more than a tool for the acquisition of specific skills, learning is in and of itself a treasure; moreover, the process of learning can and should be one of discovering and bringing forth the treasures of talent that lie within each human being. Such a view led the Commission to insist on the importance of learning throughout life, on the need to develop both a vision and a practice of education that goes beyond schooling, but which enables us to fulfil the vision of the founders of the United Nations and UNESCO: education must contribute to building peace in the minds of men and women.

**Notes**

1. J. Delors, et al., *Learning: the treasure within*, Paris, UNESCO, 1996. (Report of the International Commission on Education for the Twenty-first Century.)
2. David Matthews, *Is there a public for public schools?* Dayton, OH, Kettering Foundation, 1996.
3. Paul Kennedy, *Preparing for the twenty-first century*, London, Fontana Press, 1994.
4. Council of Europe, *Education and the information society* (ed. Michael Eraut), London, Cassell, 1991.
5. UNESCO, *Our creative diversity*, Paris, 1995. (Report of the World Commission on Culture and Development.)



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# AN AGENDA FOR THE EDUCATION OF WORLD CITIZENS

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*Torsten Husén*

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The UNESCO General Conference in 1991 accepted a mandate proposed by the Director-General of the Organization to appoint an international commission whose aim was 'to study and reflect on the challenges facing education in the coming years and to formulate suggestions and recommendations in the form of a report which can serve as an agenda for renewal and action for policy-makers and officials at the highest level.' After eight sessions—from January 1993 to January 1996—the Commission, chaired by Jacques Delors and including fourteen members from all parts of the world, was ready to submit its report, *Learning: the treasure within*, a 266-page document.

The chairman contributed a thought-provoking introductory essay on 'Education: the necessary utopia', which sets the tone of the report. The time perspective, as indicated by its sub-title, is the twenty-first century, which, in a way, and as a consequence, led to the utopian approach.

Considering the enormous diversity characterizing education in our world today with regard to aims, social and economic conditions—not to speak of practice—the Commission itself calls its mandate 'impossible'. The ambition has, however, been to focus on a topic which is central all over the world, that is, how education and its institutions can promote the creative capacity of the individual and, at the same time, promote cohesiveness in an increasingly globalized world. The Commission is aware of the risk it is running of producing banalities and glittering rhetoric. Another ambition has been to reach

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*Original language: English*

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consensus with regard to overriding values guiding education, in spite of the huge cross-cultural differences. Four main goals are stated: *learning to know*, *learning to do*, *learning to be*, and *learning to live together*. Strategies for how these goals are going to be achieved are spelled out. Education should, however, as the Commission underlines, not be regarded as a panacea for all the problems of the world, but as an important component in our attempts to establish a better world.

The analytic point of departure is rapidly increasing globalization. At the same time, the Commission notes that the fervent hopes expressed in 1945—the year when the United Nations was founded—to establish mutual understanding and equality between nations have not materialized and have led to certain disappointments. The post-war optimism tended to grossly underestimate the difficulties that the Third World would encounter when it came to adopt the technology and sciences of the highly developed countries. In this respect, one is faced with obvious tensions, for instance between the global and the local, the individual and the universal, and, not least, between tradition and modernity. Such tensions mean that the creation of a world community with the help of education implies a ‘painful birth’. Such a change also takes a considerable amount of time. A technologically sophisticated society cannot be created overnight in the Third World. The Commission emphasizes the necessity to adopt a long-term approach.

As stated, the report has an introduction written by the chairman of the Commission with the very appropriate title of ‘Education: the necessary utopia’. Whatever is recommended with regard to cross-national and cross-cultural validity and applicability for the next century has to be conceived in a utopian spirit.

One tension which the Commission does not deal with, but is rather difficult to overcome in a system of mass secondary and higher education, is the one between equality and quality. Equality of opportunity—a basic democratic tenet—rapidly comes into conflict with quality. In Western and Northern Europe, the percentage of the age cohort entering upper secondary school has quadrupled over a couple of decades, which means that more students who, ‘by nature’, are less able have been admitted, thereby affecting the average level of achievement. The increased population of students at this stage is being taught by an equally expanded teaching force recruited in competition with many other professions. However, cross-national surveys of student competence conducted by the International Association for the Evaluation of Educational Achievement (IEA) have shown that the elite—say, the top 5 to 10% of the age cohort—are achieving at the same level in comprehensive schools as they are in more elitist systems.

On the subject of secondary education, the Commission thought that formal education at this stage ‘cut rather a sorry figure in educational thinking’. This statement applies primarily to the exploding enrolment in economically developed countries, together with overcrowded curricula and diversified requirements facing the pupils. This was particularly pointed out in a report to the Academia Europaea by a task force chaired by the author of this article.

An alarming percentage of teenagers, who by law are forced to stay in school until a certain age, do not find this meaningful and hence frustration builds up among them. This explains, at least partly, why so many leave after ten or more years of schooling with deficient basic skills in the ‘three Rs’ (reading, writing and arithmetic).

Basic formal education for all must, of course, be the prime goal for educational policy in every country of the world. However, even today more than 100 million children of primary school age cannot avail themselves of schooling and an almost equal number drop out during the first few years of primary school. One could have wished that the Commission had analyzed this problem in its socio-cultural setting. Primary schooling became universal in today's most advanced countries in the wake of the industrial revolution. In an agricultural subsistence society, children early on became part of the working team in the framework of the family and the village. There was little time for going to school and being absent from the home during the working day. In the Scandinavian countries, for instance, legislated universal schooling did not require children to be absent from the home for more than a very limited number of days per year. Well into the twentieth century, it was very common in sparsely populated areas to attend school half-time, for instance, every second day or during the second half of the calendar year. Full-time attendance occurred in the urban industrialized areas where the school could also fulfil a kind of baby-sitting function. Nevertheless, the urban model of schooling has been exported wholesale to Third World countries where children have to leave the working community and sometimes walk a long way to get to school. In addition, the instruction they receive suffers from a lack of teaching material and low teacher competence. No wonder, then, that the drop-out rate is very high. In many countries, about half the age cohort has dropped out after the first three or four grades. There is also an element of residual colonialism reflected by the fact that, for instance, in sub-Saharan Africa the majority of the pupils are taught in a foreign language: the medium of instruction is the former colonial language. Instead of first making the pupils literate in their mother-tongue, they are, at an early stage—sometimes already in the first grade—confronted with a foreign language. In many cases, after half a dozen years of primary schooling, this results in illiteracy in two languages.

Like the Faure Commission almost twenty-five years ago, the present one is advancing the idea of lifelong education for all. If this includes both formal and non-formal education for all adults, no criticism can be raised. But if the main emphasis is put on educational arrangements of a formal and institutional character, one can object that basic schooling for children and youth has first to be put in order before a system for adults is set up. We have to remind ourselves that the idea of 'permanent', 'recurrent', 'continuing' and 'lifelong' education for adults was launched in the industrialized world, in the first place by agencies such as UNESCO, the Organization for Economic Co-operation and Development and the Council of Europe in the 1960s. Adult education in terms of providing a general or 'liberal' education became part of the workers' movement in Europe at the beginning of the twentieth century. These were privately initiated educational activities, such as lectures under the auspices of the extra-mural university departments or so-called study circles run by workers' educational associations. Work-related and/or career-related adult education sponsored by industrial and commercial enterprises was exceptional. But the rapid change from a repetitive industrial procedure to an information-based one dominated by services has necessitated the successive upgrading of competencies. Indeed, in some developed countries, the cost of work-related adult education exceeds by far that for basic schooling.

The chairman of the Commission presented his colleagues with the idea of an education voucher which can be given to each young individual at the end of mandatory formal schooling. It would then be up to the holder of this cheque to use it as he or she saw fit to build competence. The reader notes that the Commission accepted the idea after 'thorough discussions'.

Considering the fact that there are in the world today about 1,000 million adult illiterates, a strategy of lifelong education for a major portion of the adults in the world today is to be regarded as being, in a literal sense, 'utopian'. Eradication of illiteracy has to be the first priority and primary schooling the main instrument in achieving this goal. However, the more advanced countries on both sides of the Atlantic will, in the future, simply be forced to change their priorities from schooling the young to adult education. New technologies mark the advent of an information society. The needs for unforeseen competencies have to be met by recurrent education throughout adult life. It will become a common pattern to change occupation more than once during the working career. This will have repercussions on today's fragmented school curriculum. Basic skills, the ability to communicate, to calculate and to learn how to learn will become central. Skills acquired during formal schooling can be employed for a broad repertoire of mainly unforeseeable tasks during adult life. Specific pieces of textbook knowledge will tend to become obsolete.

Quite evidently, reforms are needed in order to cope with the failings of formal schooling, such as high drop-out rates, inadequate curricula and a lack of connection with the broader surrounding society that the school is expected to serve. It is important to get the reform strategies right. There are, indeed, certain principles which constitute the backbone of such strategies. In the first place, as the Commission rightly points out, it is necessary to take a long-term approach. An education system cannot be changed overnight and reformers have to arm themselves with patience and realistic optimism. In the meeting of the African ministers of education in Addis Ababa in 1960, glowing resolutions were passed about 'eradicating' illiteracy within a couple of decades. When the ministers next met eight years later in Nairobi, they were faced with the fact that, even though the number of children in primary school had increased, the absolute number of illiterates had grown.

Further, the local community has to be closely involved in participating in the reform work. East Harlem has been pointed out as a good example of such participation in the United States. Another example that the present reviewer would like to mention is the Accelerated Schools Project based at Stanford, California. Parental commitment is one of the main pillars of this project.

Schools and their teachers cannot make good the failings of other institutions in society, such as the family. In Europe and North America, particularly in the big cities, social problems have tended to move into the schools, which are usually not well-equipped to deal with them. There is no other institution better equipped to impart knowledge than the school; the home can only partly serve as a substitute and as a supporting partner.

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Education—formal or informal—irrespective of where it takes place, should have as an overriding objective the education of citizens who can live and fulfil their roles in the

surrounding community, in the nation to which they belong and, last but not least, in the world at large. This calls for a sufficiently diversified policy with the purpose of promoting social cohesion and understanding, as well as fostering a desire to live together. It all amounts to cultivating the capacity for democratic participation. Changes in production, in urbanization and the flurry of events mediated by radio and television make it increasingly difficult for people to find their way in the new world. Many social ties, which were important in a more static world, are severed. People can no longer be trained for stable jobs because many—perhaps most—of the jobs which they enter after leaving school will disappear as a result of technological changes. This makes it all the more important, as the Commission points out, to place emphasis on training individuals to become innovative and to enable them to adapt to a rapidly changing world.

The Commission has had the excellent idea of providing each member with an opportunity to express his or her ideas, which compensates for the tendency to produce watered-down generalities; this is a temptation when it comes to formulating analyses and recommendations which can be accepted by everybody everywhere. These texts serve as a valuable complement to the brilliant introductory essay authored by the chairman of the Commission.

It is to be hoped that the report, with all its challenges, will be followed up. In the role of Chairman of the Board of the International Academy of Education, the present author is happy to report that the academy has recently decided to set up a task force which will reflect on the challenges advanced by the Delors Commission and make certain recommendations that respond to these challenges.

*Learning: the treasure within* will most certainly become a landmark in the history of modern education. Jacques Delors and his Commission have been able to cope with the 'impossible': to give us a comprehensive picture of the state of the art of education in the world today, to identify significant future challenges and to advance major recommendations. It is a document full of wisdom and worthy of a worldwide readership.

## Note

1. Delors, J., et al. *Learning: the treasure within*. Paris, UNESCO, 1996. (Report of the International Commission on Education for the Twenty-first Century—the Delors Report.)

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# ADULT EDUCATION

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## POLICY PROJECTIONS

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### IN THE DELORS REPORT

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*H. S. Bhola*

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#### **Introduction**

The Report to UNESCO of the International Commission on Education for the Twenty-first Century (Delors et al., 1996; hereafter the Delors Report) is a document of potential long-term influence on education around the world. Education policy today is impossible to contemplate independently of development policy, lending even greater significance to the document. Undoubtedly, the Delors Report deserves serious attention from educators and development specialists from around the world: on the one hand, to honour those who served on the Commission and to express appreciation for the contributions of all others who helped with its work; and, on the other hand, to embark on the necessary tasks of critical understanding, transfer, and contextualization of the Commission's recommendations in different settings of development and education.

#### **Questions of policy analysis**

This policy analysis and critique will be conducted in terms of three interrelated questions: Is the policy principled?; Is the policy professionally sound?; and Is the policy practical?

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*Original language: English*

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(Bhola, 1993). Answers to these questions are not possible in an absolute sense, because the norms and criteria of being principled, professionally sound or practical are themselves under sharp contestation. Advantages claimed for this analysis and critique are those of being systemic (i.e. holistic and comprehensive) and systematic (i.e. logically organized) (Bhola, 1989).

## A synopsis of the critique

This paper presents an analysis of the policy projections of the Delors Report, particularly in regard to *adult education*.<sup>1</sup> A careful reading of the report permits the following to be said: The Commission projects a future world that appears to be an extension of the globalized world of today. Since the Commission equates development with modernization, its report clearly has greater relevance for the developed countries of the West than for the developing nations of the world. The Commission considers 'learning throughout life' to be a part of the necessary Utopia in the twenty-first century. In the actualization of learning throughout life, however, adult education has been assigned at best a secondary role. On the other hand, the Commission has emphasized formal institutional structures at the expense of alternative forms of education, and seems to lend much greater urgency to preparing children and youth for the future than to meeting the present-day learning needs of adults—'yesterday's children'—by-passed by the formal systems of education in the developing areas of the world. Whether all of the above was intentional on the part of the Commission is difficult to say, especially because the text and sub-text of the report do not always seem to flow in the same direction.

## Echoes from a round-table

Indeed, the round-table (UNESCO, 1995*b*), organized by UNESCO to discuss the preliminary synthesis of the Delors Report (UNESCO, 1995*a*), sensed several problems with the Commission's choice of a vantage point—for instance, it did not seem to take the developing world into its range of sight or knowledge—and with its ideological position—it did not show genuine moral fervour for the uplifting of the less-privileged sector of the 'global village'. The round-table noticed with disapproval the report's excessive materialism; its formal and institutionalized approach to the delivery of education made the school *the* place to educate; and it seemed to exclude community-generated learning needs and community-based learning arrangements. Conditions of living and learning that pervade the developing world, and which influence how grown-ups learn, seemed to have been misconstrued by the Commission. The report was also criticized by the round-table for not fully developing some of its important ideas, for failing to provide enough guidance for application and implementation of its own recommendations, for its mutually contradictory statements, and its general ambiguity (UNESCO, 1995*b*). The systemic-systematic critique (Bhola, 1989, 1993) of the report presented later indicates that the problems first sensed by the round-table have persisted in the final version of the Delors Report.

## The Commission and its framework of imagination and ideas

The International Commission on Education for the Twenty-first Century was established in early 1993 'to study and reflect on the challenges facing education in the coming years, and to formulate suggestions and recommendations in the form of a report that [could] serve as an agenda for renewal and action by policy makers and officials at the highest levels' (UNESCO, 1995a, p. 1). The Commission submitted its report in April 1996. In terms of a retrospect, the Delors Report can be seen to have three time horizons: the mid-1940s in the aftermath of the Second World War; 1972, the year of publication of the Faure Commission Report, *Learning to be: the world of education today and tomorrow*—the first ever international commission on education appointed by UNESCO; and 1989, the year of revolutions, which marked the end of the Cold War, the resurgence of capitalism, and when the free market *mantra* rang and resonated around the globe.

The 1990s have been the best of times and the worst of times. The end of the Cold War did not necessarily bring warmth and comfort to peoples and nations. The stone slabs of State oppression were lifted from many lands, but the flowers of peace and freedom did not always spring forth. Genocide and rape were perpetrated by one ethnic group on another to settle old scores. Totalitarianism masqueraded as democracy. Peace dividends did not materialize. Free market economies turned out to be 'casino economies' that robbed people of their life savings and pensions and pauperized the already poor. There was betrayal of hopes—and yet there were flights of idealism toward a world of peace and prosperity.

### THE IDEALISM OF DEVELOPMENT SUMMITS

The first half of the 1990s will be remembered as the era of development summits (Delors et al, 1996, p. 178) when the best of the world's enlightened minds, full of moral fervour, summoned peoples and nations to assume ownership of and responsibility for the world in which they live, and in which their children will bring up children of their own.

The Earth Summit (formally called the United Nations Conference on Environment and Development), held during June 1992 in Rio De Janeiro, Brazil, determined that the roots of underdevelopment and environmental destruction lie in global socio-economic realities and in unequal political relations. The summit proclaimed that sustainable development was unattainable within a global development frame that continued to create poverty in the South and higher and higher levels of consumption in the North (United Nations, 1993a).

At the World Conference on Human Rights, held in Vienna in June 1993, there was a recommitment to human rights. This conference saw clear connections between and among human rights, democracy and development (United Nations, 1993b).

The International Conference on Population and Development, held in Cairo in September 1994, identified clear connections among demography, environment and poverty, and demanded that population policies become part of cultural, economic and social devel-



opment policies. For the practical realization of the 'Spirit of Cairo', schooling had to play a role in the dissemination of knowledge and technology, but more importantly, a massive program of *adult education*, particularly directed to adult women, was seen to be an absolute necessity (United Nations, 1995a).

The Copenhagen Declaration and Programme of Action adopted at the end of the World Summit for Social Development, March 1995, was characterized by United Nations Secretary-General Boutros Boutros-Ghali as 'a new social contract at the global level' whose single essential purpose was 'to fight poverty, to create productive jobs, and to strengthen the social fabric'. It asked policy-makers to 'ensure that structural adjustment programmes include social development goals' and asserted that social development could not be achieved by simply relying on economic growth arising from uninhibited market forces. Most importantly, it asked for the will to 'attain universal and equitable access to education and primary health care' and to 'formulate and strengthen time-bound national strategies for the eradication of illiteracy and universalization of basic education' (United Nations, 1995b).

Women's rights were human rights, proclaimed the Beijing Declaration and a Platform for Action adopted on 15 September 1995 at the end of the fourth World Conference on Women: Action for Equality, Development and Peace, Beijing, China. The Conference Declaration recorded the determination of governments to 'promote people-centred sustainable development, including sustained economic growth through the provision of basic education, life-long education, literacy and training, and primary health care for girls and women'. Due attention was paid to the enhancement of the role of the media in promoting awareness and education (United Nations, 1995c).

Taken together, the development summits of the 1990s imagined a future world of human rights, political freedom, economic fairness and new social contracts, which with sustainable development would end poverty forever. The reports from the summits were also statements of the essential curriculum for the world's children, and *even more so for the education and 'second socialization' of the world's adults*. There was also the clear implication that, while basic education given in schools had an important role to play in the dissemination of this curriculum, community-based programmes of adult literacy, adult education and non-formal education had an even greater role to play because of their dynamism and immediacy in bringing about both modernization and democratization in developing societies.

A careful reading of the Delors Report shows that, while the Commission freely borrowed the language of idealism used at these summits, it did not fully internalize it; and did not directly and clearly accept the role of adult literacy, adult education and non-formal education in the actualization of a future world community as imagined at the summits. The Commission's recommendations are somewhat discontinuous with the spirit of the Faure Commission Report (1972). The former's conceptualization of both development and education seems to be apolitical. Ideologically, the Commission's recommendations triangulate with the 'Education for All' initiative of 1990—not as declared in 1990 (Interagency Commission, 1990), but as actually implemented during 1990–95 (UNESCO, 1996)—and with the World Bank's conceptualization of its priorities and strategies for education (World Bank, 1995).

## **The school house that Jacques built: the Commission's proposals on formal education**

The school house of the Commission's imagination has been built on a site in the 'global village' where education will be the necessary instrument of the future Utopia. The Delors Report *rightly* relates the location and function of education to both individual achievement and social development in the changing world of today and tomorrow. Education is seen as the principal means to foster human development and 'to reduce poverty, exclusion, ignorance, oppression and war' (p. 13).

### THE FOUR PILLARS OF EDUCATION

The Commission is both eloquent and wise in its description of the four pillars of education:

1. *Learning to live together*, 'by developing an understanding of others and their history, traditions and spiritual values and, on this basis, creating a new spirit which, guided by recognition of our growing interdependence and a common analysis of the risks and challenges of the future, would induce people to implement common projects or to manage the inevitable conflicts in an intelligent and peaceful way' (p. 22).
2. *Learning to know*, that is, acquiring 'sufficiently broad general education with the possibility of in-depth work on a selected number of subjects' (p. 23). 'Such a general background provides, so to speak, the passport to lifelong education, in so far as it gives people a taste—but also lays the foundations—for learning throughout life' (p. 23).
3. *Learning to do*, so as to be able to act creatively on one's environment. 'In addition to learning to do a job of work, it should, more generally, entail the acquisition of a competence that enables people to deal with a variety of situations, often unforeseeable, and to work in teams . . . becoming involved in work experience schemes or social work . . . attached to all methods of alternating study with work' (p. 23).
4. *Learning to be*, a theme first introduced in the Faure Commission Report (1972) is accepted, but is then claimed to have been expanded. The Delors Report stresses a further imperative: 'none of the talents which are hidden like buried treasure in every person must be left untapped. These are, to name a few: memory, reasoning power, imagination, physical ability, aesthetic sense, the aptitude to communicate with others and the natural charisma of the group leader, which again goes to prove the need for greater self-knowledge' (p. 23). The Commission then adds 'another Utopian idea: a learning society founded on the acquisition, renewal and use of knowledge' (p. 23–24).

### INTERPRETATION OF LEARNING THROUGHOUT LIFE

To meet the challenge of today's world, says the Delors Report, learning throughout life must be 'the heartbeat of society'. *Learning throughout life* is a newly coined category

which is asserted to be advantageous in terms of 'flexibility, diversity and availability at different times and in different places' (p. 21). The Commission asserts that it is broader than the notion of lifelong education. 'Not only must [learning throughout life] adapt to changes in the nature of work, but it must also contribute a continuous process of forming whole human beings—their knowledge and aptitudes, as well as the critical faculty and the ability to act. It should enable people to develop awareness of themselves and their environment and encourage them to play their social role at work and in the community' (p. 21).

It is to be noted that while learning throughout life is the heartbeat of society, formal education structures—basic education, secondary education, and higher education—are to be the main body of the system of education. Learning throughout life has to be delivered, preferably and for the most part, by and through the structures of formal education.

### *Thinking principally of schooling*

The Commission reminds us not to overlook the fact that: 'The Commission was thinking principally about the children and young people who will take over from today's generation of adults, the latter being all too inclined to concentrate on their own problems' (p. 13). This statement can easily be misread to imply a disinterest in the real-life problems of adults and a disregard for their learning needs for solving those problems. The Commission also seems to miss the treasure within the synergies of educating both children and their parents.

### *Formal basic education as central*

'Nothing can replace the formal education system,' the Commission asserts once again. Formal basic education for all is a must. The Commission offers it as a fundamental truth that 'although people need to take every opportunity for learning and self-improvement, they will not be able to make good use of all these potential resources unless they have received a sound basic education' (p. 21).

### *Secondary education*

Secondary education is to be rethought in the overall context of learning throughout life. It is to be allocated a *pivotal role* in the individual learning paths of young people through schooling, 'without ever closing the door on the possibility of a subsequent return to the education system . . . no doors would ever be closed in the future, including the doors of the school itself' (p. 139).

### *Higher education*

Finally, in the Commission's view, in the twenty-first century, universities will be 'some of the *main meeting-places* [emphasis added] for learning throughout life, opening their doors

to adults who wish either to resume their studies or to adapt and develop their knowledge or to satisfy their taste for learning in all areas of cultural life' (p. 27), thereby, together with secondary education, 'providing a valid answer to the challenges of mass education' (p. 139).

### **The role of adult education: as stated and as implied**

In the Commission's scheme of things, while formal education is central, adult education (and its associated categories of adult literacy and non-formal education) are rendered peripheral. These categories do not appear in the table of contents of the Delors Report. Policy positions on adult literacy, adult education and non-formal education are more often implied than stated directly in the text.

#### OUTSIDE OF POLICY DESIGN, INSIDE THE DISCOURSE OF PRACTICE

While adult literacy, adult education and non-formal education are not directly part of the Commission's policy design, these categories remain part of its discourse of practice. As the Commission declares: 'The rise in school enrolment figures and literacy rates, and the fresh impetus given to basic education, thus herald an increased demand for *adult education* [emphasis added] in the societies of the future' (p. 101).

The Commission returns to adult education in a brief section, entitled, 'New times, fresh fields', and says:

The substantial increase in the demand for *adult education* [emphasis added], so great that it has sometimes been referred to as a veritable explosion, has often been stressed. Adult education takes on many different forms, such as basic education in non-formal settings, part-time enrolment in higher education, language courses [read literacy], vocational training and retraining, courses organized by various associations or trade unions, open learning systems and distance teaching. In some countries, Sweden and Japan for instance, around 50 per cent of the population are at present involved in adult education, and there is every reason to think that all over the world the development of adult education represents a strong and sustained trend that may cause education as a whole to reorient itself in the direction of lifelong education (p. 103–04).

On page 122, there is another paragraph on adult basic education and literacy:

For adults, basic education and *literacy programmes* [emphasis added] tend to be more appealing if they are linked to the acquisition of useful skills related to agriculture, crafts and other forms of economic activity. Adult education also provides an excellent opportunity for dealing with environmental and health issues, population education, and education for understanding different values and cultures. The use of mass media for educational purposes can introduce people to a world beyond that of narrow individual experience, in particular to the science and technology that pervade the modern world but are not yet widely available to the citizens of developing countries (p. 122).

Finally on page 124 there is another paragraph that sounds quite reasonable:

Community participation in education, particularly at the basic education level, must go hand-in-hand with commitment and strong action on the part of the state, which has an important role to play in ensuring that the children of all communities have the chance to receive a good education and that adults are given learning opportunities relevant both to their work and to their quality of life (p. 124).

#### FORMALIZATION OF ADULT EDUCATION

A reading of the above paragraphs seems to indicate that the Commission accepts—or at least tolerates—the need for education and training now being delivered under the adult literacy, adult education and non-formal education labels, and through non-formal and informal arrangements and institutions. What they seem to be saying is that *most* of what is now taught under adult education and non-formal education should preferably, or for the most part, be taught through the structures of formal education. They want to establish the primacy of formal education, and tolerate non-formal education and informal education where it might be necessary in the meantime.

To remove any ambiguity about the position stated above, the Commission states:

The idea of learning throughout life has not misled the Commission into overlooking the importance of formal, as against non-formal or informal education. On the contrary, it believes it is within formal education systems that the skills and aptitudes individuals will need in order to carry on learning are acquired. The role of formal and informal education, far from being in opposition one to the other, is therefore to cross-fertilize each other (p. 115).

### **Is the policy principled?**

An answer to this question, of course, involves an analysis of principles and values of policy. Questions of ideology and theory of development and education are also implicated.

#### GLOBALIZATION WITH WESTERNIZATION

The West, of course, has been on a trajectory of ascendance for centuries and may continue to be dominant well into the future. Inevitably, globalization has become equated with Westernization, and not always with universalism. While Westernization on a global scale has brought several material benefits of science and technology to the peoples of the world, it has certainly been a mixed blessing.

Globalization, the Delors Report rightly declares, is the transcendent reality of today's world—which then is riddled with contradictions and tensions between 'global and the local', 'the universal and the individual', 'tradition and modernity', 'long-term and short-term considerations', 'competition and . . . concern for equality of opportunity', 'the extraordinary expansion of knowledge and human beings' capacity to assimilate it', and between 'the spiritual and the material' (p. 17–18).

The Commission notes that there is a 'prevailing mood of disenchantment' in our world today. There is 'rising unemployment', 'the exclusion of growing numbers of people in the rich countries', the realization that 'all-out economic growth can no longer be viewed as the ideal way of reconciling material progress with equity'. 'We have by no means grasped all the implications of this [set of conditions] as regards both the ends and means of sustainable development and new forms of international co-operation' (p. 15). Indeed, violence and war continue, as demonstrated by the fact that since 1945, some 20 million people have died in nearly 150 wars. Democracy is 'showing signs of languishing in countries which have had democratic institutions for many decades' (p. 16).

The Delors Report admittedly projected 'its thinking on to a future dominated by globalization'; but then accepted the impossibility of the 'task of overcoming the obstacles presented by the extraordinary diversity of situations in the world' (p. 14). In so doing, it accepted globalization as destined and determined in the world's future. The Commission seems to be saying that 'All is well with this world' and appears to be completely comfortable with and complacent within the existing international political and economic order. What is good for the West is good for the rest. Thus, the future world is seen as closed and sealed—and in good health, except for some social, political and cultural tensions. Possibilities of alternative futures, of spaces for multiplicity of cultures, of change in political and economic relations in favour of the subaltern people and classes, are not imagined.

#### THE COMMISSION'S PREFERRED MODEL OF DEVELOPMENT

The Delors Report ostensibly accepts the development ideology and the development model presented in the work of the UNDP on human development (UNDP, 1995). On the other hand, it sees no contradiction in exhorting the developing countries to not 'disregard the classic forces driving growth, in particular as regards their need to enter the world of science and technology, with all this implies in terms of cultural adaptation and the modernization of mentalities' (p. 15). The echoes of development as modernity (Inkeles & Smith, 1974) are heard loud and clear in this cautionary statement. The Delors Report does not seem to realize that economistic models, wherein the modernization of the economy was of the essence, and human resource development (the instrument for training labour to give them new skills and new mentalities) have failed—in the developing world, if not in the developed world.

A report addressed to all the nations of the world should have talked of a new concept of development, of cultural and social accountability, and a new definition of a good life which is not described merely in terms of higher and higher levels of material consumption. There should have been discussion of new concepts of profit and productivity and on creating work outside formal jobs. Concomitantly, there should have been talk of a new ethics of frugality and a definition of personal fulfilment as the life of a cultural being living in and contributing to the building of a moral order—locally and globally. There should have been some conversation on the necessity to balance globalization with re-localization, to create spaces for alternative identities and cultures (Thiel, 1997).

## THE COMMISSION'S IDEOLOGY OF EDUCATION

Inkeles and Smith (1974), in offering a model for modernity, had also offered a model for education. They had given the role of training and socialization for modernity to the school and the factory. The Commission, having adopted modernity for development, chooses formalism for education, and links education directly to the workplace. Formal basic education is central. Adult education (including adult literacy) delivered non-formally is discounted.

Thus, the educational ideology of the report reflects its overall political ideology and development theory: education as preparation for a future working life, not for social praxis in the present; and formalization of education, not a freeing of the process of education from bureaucratic systems of delivery. Education of the child is *rightly* made central to the educational enterprise, but the education of adult men and women is seen, at best, as a necessary nuisance.

## SHORTCOMINGS OF THE REPORT: A CRITIQUE OF ITS VALUES

What the report lacks is a bi-focal vision. Education of the adult in formal and non-formal settings, and the provision of adult literacy—both needed an equally sharp focus. The lack of attention to these sub-sectors results in the abandonment of adult education as a conceptual category and makes it operationally a step-child of formal education.

Adult education activities almost always involve some community organization, and by underplaying their role, the Delors Report appears unsympathetic towards community organization and community-based institutions, thereby keeping adults out of politics and on the margins of the economy. The Commission thus works against the possibility of adding dynamism to the civil society wherein community action and adult education can come together. The Commission seems to exclude the powerless, the disenfranchized, the unrepresented constituencies—‘the forgotten billion’, most of them living in the developing world, who are already here and need inclusion into their societies. By choosing a narrower rather than a more inclusive and larger system of human solidarity, the report retreats from its declared global vision.

It should be said that this critique, in praising adult education delivered in non-formal settings, does not mean to damn basic education for all *per se*. Basic education which is, at the same time, learner-centred, community-centred, culture-centred and globally-oriented, is a progressive idea and has indeed come to acquire the status of a basic human right. However, basic education can become a regressive idea if, instead of being a tool of personal growth and understanding of humankind, nature and society, it is reduced to a mere tool for the social reproduction of labour and to the professionalization of labour for greater productivity, and higher economic returns to the captains of the global economy. Within societies, while basic education might indeed deliver the highest economic and social returns, secondary and tertiary education cannot be neglected. To its credit, the Commission does make the point that we cannot tolerate an educational order wherein most of the powerless in the world receive basic education to be able to perform in the national and global economy on low wages.

Finally, the implication of this critique of values and principles of the Delors Report is not to agitate for 'non-Western futures without factory and school!'. Mass production of goods in factories will be necessary if the basic needs of the masses are to be met. But that should not necessarily mean rejection of the economics of 'small is beautiful' or even of Gandhian economics with some production based in the family, in the village or corporations of villages. In the same way, this critique does not ask for a de-schooled society, nor does it imply that universalization of basic education is a bad idea. The problems this critique has with the 'mindset of the report' are its determinism in imagining a future world—in regard to its culture, politics, economy and education—and the exclusion from its concerns of those most in need of redress, namely the illiterate and the unskilled adults.

### **Is the policy professionally sound?**

The question here is about the soundness of policy in regard to the theoretical understandings and research knowledge in the particular policy domain. The policy under discussion in this paper involves at least three clusters of UNESCO Member States: developed countries; developing countries; and the least-developed countries (LDCs)—each with different sets of concrete conditions in regard to cultural, political, social, economic and educational conditions. In each case, however, the policy of 'learning throughout life' under review would involve two sets of educational institutions: the formal education institutions which, as implied in the Delors Report, will progressively assume more and more of the burden of learning throughout life; and the set of existing adult literacy, adult education and non-formal institutions and structures (in many countries few such structures exist) which would slowly have less and less to do—and is destined somehow to disappear, some time in the future.

With hindsight, one can find several flaws in the conceptualization and professional formulation of policy proposals—as directly made, and as indirectly implied—in the report. There are problems of definition and elaboration. There is a lack of sensitivity to the history of the institutions of adult education (including UNESCO itself), and there are problems with understanding the behaviour of schools and universities as organizations and institutions.

#### **RE-NAMING, RE-DEFINING, ELABORATING**

The shift from lifelong learning to the new phrase 'learning throughout life' ends up being a distinction without a difference. The attempt to install a new concept in place of adult literacy, adult education and non-formal education does not seem to be successful. These three concepts refuse to become invisible. In the case of developing countries at least, the Delors Report is unable to offer proposals on learning throughout life without bringing adult literacy, adult education and non-formal education in again through the back door. The educational and employment needs of industrialized Western populations—both of migrants and natives—will also need adult literacy programmes.

Qualities of 'flexibility, diversity, and availability at different times and in different



places' (p. 21) are part of the definition of learning throughout life—which is also the justification for adult education offered through non-formal education means. The *major* difference seems to be that learning throughout life is recommended to be handled by and through the formal structures of the school and institutions of higher education.

#### STRUCTURES OF DELIVERY OF LEARNING THROUGHOUT LIFE

The Commission may have been both too Western and too optimistic in assigning the delivery of learning throughout life to institutions of formal education (and particularly to institutions of higher education). The following assumptions seem to be implicit in the report: that basic education will become near-universal and that it will be of such quality and consistency that no one will ever need a second chance for basic education; that secondary education will become near-universal as well; and that higher education will move towards mass higher education. Institutions of higher education will become widely accessible in the physical or virtual sense; and formal education structures, by internal organization of levels, will indeed provide varied pathways to learning through multiple stages and bridges (p. 160). Finally, structures of formal education will be interested in and able to minister to the needs of adults in their societies and will be willing to establish patterns for extension and outreach and to deploy the needed resources to perform the new tasks and meet the new challenges.

In the meantime, the devaluing, if not the dismissal, of present systems, structures and delivery mechanisms of non-formal adult education may have been both hasty and unhelpful on the part of the Commission. Indeed, the current institutional structures for the delivery of adult literacy, adult education and non-formal education make ideological and theoretical sense at the same time. Ideologically, they can better serve popular interests by being responsive to the needs of learners. By being non-formal, that is, by delivering education—and particularly developmental knowledge—outside the formal structures of education, they do what formal structures, historically, have been both unable and unwilling to do. Formal education systems in the West may perhaps be able to assume some role in delivering education and training for those engaged in 'learning throughout life'. But asserting that they will one day carry the whole burden is too optimistic. In the non-Western world, this may not be possible for a long time to come, especially *if adult learners are expected to pay for their learning*.

The tasks of *education and second socialization* of peoples in the developed and the developing world should not be taken lightly. The Commission seems to have failed to recognize that these tasks cannot be confined to the formal settings of the school and the university. New knowledge, attitudes and skills must be taught to adults wherever they live and work, whenever they need to learn, and whenever they can be persuaded to participate. It is easy to agree with the Commission's assertion that lines between schooling, working years and retirement will be less well-defined in the future. But it does not follow that, therefore, the task of learning throughout life should be left to institutions of formal education. In any case, that future is not here yet and it may be years or even decades before it arrives in the poor nations of the developing world. A clear-cut definition, a separate organization, and adequate support for the delivery of adult literacy and

adult education outside the formal education system seems absolutely necessary at the present moment—at least in the developing world.

#### UNESCO'S HISTORY OF PRIDE IN ADULT EDUCATION

The most puzzling aspect of the report is that, in proposing its idea of learning throughout life, and in trying to make adult education invisible, it ends up robbing UNESCO of its long and proud history of leadership in adult education. UNESCO has prided itself on being an institution of adult education and has half a century of leadership in the field, having held four landmark international conferences on adult education: Elsinore, 1949; Montreal, 1963; Tokyo, 1972; and Paris, 1985 (Bhola, 1989). Plans are afoot for a fifth international conference to be held in Hamburg during 14–18 July 1997 (UIE, 1996). As UNESCO is deprived of its history, professional adult educators are in danger of being disinherited from a rich tradition of professional knowledge of theory and practice of adult education developed over the last half century within adult education and in the social and behavioural sciences.

### **Is the policy practical?**

Practicality is the problem of implementation. What do implementation theory and actual practice in the delivery of educational services portend for the Commission's recommendations as they relate to the delivery of services to enable 'learning throughout life' by youth, women and men living all over the globe?

Implementation in this particular case must occur at various levels. First, as a commission report submitted to UNESCO, it will percolate through processes of discussion and debate within UNESCO and its affiliated institutions and organs. Then, on arrival in the ministries of education (and departments of finance) of UNESCO's Member States, the Delors Report will have to be negotiated through the policy culture of each and every country.

Since each country will have its own (i) particular ideological environment and differing commitments to work in the interest of its people, (ii) specific configurations of educational institutions and educators, (iii) varied formal linkages of policy implementation and informal networks of information and influence, and (iv), most importantly, varying resources available for allocation to the structures of learning throughout life, probabilities of implementation will differ widely from country to country.

It can be surmised that learning throughout life will perhaps meet the most favourable attention and conditions for implementation in the developed countries of Europe, North America and Japan, and the newly developed countries of East Asia. In the developing countries and in the least-developed countries (LDCs), there will be serious problems both of institutional incapacity and lack of resources. This may be made more difficult by the fact that the Commission has not made any suggestions in regard to the organizational structures of learning throughout life. The vested interests of the agents and institutions of adult literacy, adult education, and non-formal education will have to be fought out. On the other hand, implementers will face the inertia of institutions of formal education

and their incapacity to launch programmes of extension and outreach to deliver education to those wishing to engage in learning throughout life. The silver lining of this policy cloud, ironically, may be that the policy would not be implemented (or be implementable) any time soon—though some adult education programmes are sure to trade old labels for new and may re-label their ongoing programs as ‘learning throughout life’ programmes.

## Summation in seminars

To no one’s surprise, the summation of critiques of the Delors Report by participants in two seminars at Indiana University<sup>2</sup> recalled many of the remarks made by participants at the Round-Table (UNESCO, 1995b) quoted in the first part of this analysis and critique. The Delors Commission Report was found to be ‘westernized’, ‘paternalistic’ in tone, and lacking in ‘moral vigour and energy’. The report seemed to be declaring globalization to be an accepted fact and an unquestioned value—and the fate of the world. Tradition was seen as quaint and ‘nice’, but the dynamic of change was seen as unidirectional and inevitable, leading to a homogenized world. The Commission’s enthusiasm for technology was seen as misplaced, and its neglect of the issue of languages of instruction was regretted. The educational agenda of the Commission seemed to be apolitical civic education that would, at best, teach people to be cautiously critical. The participants in the seminars thought that what the Delors Report expected from formal education structures would not be delivered; and what the Commission wished to be taught under learning throughout life could not be delivered without adult education.

## Concluding remarks

For someone reading the Delors Report from the perspective of adult education, a sense of disappointment will be unavoidable because it is, in the best of circumstances, ambiguous about its commitment to adult literacy and adult education and, at worst, perhaps hostile to non-formal and informal education opportunities. But, on the other hand, misgivings about the report could be mobilized to forge the will of adult educators around the world: to reclaim the mission of adult education on behalf of the excluded and disadvantaged; to renovate and expand the structures of policy making, planning, and implementation of adult education; and to multiply the resources currently dedicated to adult education. Thereby, adult education could rightly be offered to complement and supplement the role of formal education in the processes of modernization, democratization and authentic social development, in partnerships with the State, the civil society and the international community. The forthcoming fifth International Conference on Adult Education, to be held in Hamburg, Germany in July 1997 provides the moment to do just that.

## Notes

1. The definition of adult education assumed herein is that included in UNESCO, *Recommendations on the development of adult education adopted by the General Conference*

- at its nineteenth session, Nairobi, 26 November 1976. Paris, UNESCO, 1976. For a definition of adult literacy, see H.S. Bhola, 'Literacy', *Encyclopedia of information and library sciences*, London/ New York, Routledge, 1997. The term non-formal education is defined in Manzoor Ahmed and Philip H. Coombs, eds., *Education for rural development: case studies for planners*, New York, Praeger, 1975.
2. With acknowledgements to my faculty colleagues in the department of educational leadership and policy studies in the School of Education, Indiana University, and to the participants in my two graduate seminars: (i) Seminar in Education Policy Studies (H620), Fall 1996; and (ii) Education and Change in Societies (H560), Spring 1997. In both of these seminars, the Delors Report was the subject of discussion. Special thanks to Ms. Rachel Katherine Christina, doctoral student in the Educational Policy Studies Program at Indiana University, for her competent and thorough reading and editing of the manuscript.

## References

- Bhola, H.S. 1989. *World trends and issues in adult education*. Paris, UNESCO; London, Jessica Kingsley Publishers.
- . 1993. *Coming in from the cold: putting adult basic education on the national agenda*. Johannesburg, South African Committee for Adult Basic Education.
- Delors, J., et al. 1996. *Learning: the treasure within*. Paris, UNESCO. (Report to UNESCO of the International Commission on Education for the Twenty-First Century.)
- Faure, E., et al. 1972. *Learning to be: the world of education today and tomorrow*. Paris, UNESCO. (Report of the International Commission on the Development of Education.)
- Inkeles, A.; Smith, D.H. 1974. *Becoming modern*. Cambridge, MA, Harvard University Press.
- Inter-agency Commission (UNDP, UNESCO, UNICEF, World Bank). 1990. *World conference on education for all: meeting basic learning needs, 5–9 March 1990, Jomtien, Thailand. Final Report*. New York.
- Thiel, R. 1997. One world—one future. *Development and co-operation*, no. 1, p. 30.
- UNESCO. 1995a. *The International Commission on Education for the Twenty-first Century: Report of the Commission. Preliminary synthesis*. Paris.
- . 1995b. *Round Table on the Preliminary Synthesis of the Report of the International Commission on Education for the Twenty-first Century*. Paris. (Vr. 1/RT prov.)
- . 1996. *Education for all: achieving the goal. Working document for the mid-decade meeting of the international consultative forum, June 16–19, 1996, Amman, Jordan*. Paris. (The International Consultative Forum is an Alliance of UNESCO, UNICEF, UNDP and the World Bank.)
- UNESCO Institute for Education. 1996. *Fifth international conference on adult education (CONFITEA V) 14–18 July 1997—Adult learning: a key for the twenty-first century*. Hamburg, Germany. (<http://unesco.uneb.edu/educnews/confitea/#iii>)
- United Nations. 1993a. *Report of the United Nations conference on environment and development, Rio de Janeiro, 3–14 June 1992, vol. 1, Resolutions adopted by the conference*. New York.
- . 1993b. *World conference on human rights. The Vienna declaration and programme of action, June 1993*. New York.
- . 1995a. *Report of the International Conference on Population and Development, Cairo, 5–13 September 1994*. New York.
- . 1995b. *The Copenhagen declaration and program of action. World Summit for Social Development, 6–12 March 1995*. New York.

- . 1995c. *The fourth World Conference on Women: action for equality, development and peace, September 4–15, 1995, Beijing, China. Beijing declaration and a platform for action*. New York.
- United Nations Development Programme. 1995. *Human development report, 1995*. New York/Oxford, Oxford University Press.
- World Bank. 1995. *Development in practice. Priorities and strategies for education. A World Bank review*. Washington, DC.

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# EDUCATION AND THE CHANGING WORLD ECONOMY: THE IMPERATIVE OF REFORM<sup>1</sup>

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A new World Bank paper, *Priorities and strategies for education* (1995), proposes six key reforms to developing countries' education systems so that education can contribute more to the sustainable development of society, economic growth and poverty reduction. This article highlights some of the paper's arguments, particularly those concerning the role of public intervention and public finance. It summarizes the challenges that the changing world economy poses for education systems and observes that the private returns from investing in education are high. It then discusses the rationale—even with these high private returns—for public intervention and public investment and makes recommendations on the allocation of this public investment and compares this with the pattern of public education investment observed in many developing countries. Finally, it is argued that the key reforms proposed in the paper will help change this reality.

## **The changing world economy**

The world economy is today more market-oriented as a result of domestic deregulation in most countries and the explicit adoption of market systems in the formerly centrally planned economies. The world economy is also more integrated as a result of the fast devel-

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opment of communication systems, trade liberalization and expansion, the universal availability of rapidly changing technology and increased migration. Around the world, technology is increasing the role of knowledge as the driving force for innovation and productivity growth. Technological developments and labour-market changes have produced higher wages for almost all workers in developing countries. The opening up of markets around the world and the rapid flow of goods and ideas from country to country is creating many new opportunities. These changes have led to dramatic shifts in labour markets, placing new demands on education systems. In response, countries belonging to the Organisation for Economic Co-operation and Development (OECD) are making major changes to adapt their education systems; developing countries, in general, have yet to do so.

Developing countries must reform their education systems in order to benefit from changes in the world economy. Among the priorities for reform are: (a) to restore quality, which is lower than in the OECD countries, especially now that more students are accommodated; (b) to achieve equity, since the ranks of the uneducated increasingly consist of the poor, of women and of ethnic minorities; (c) to meet rapidly increasing demand for secondary and higher education; and (d) to achieve sustainability in the light of almost universal fiscal restraint.

## **Returns to schooling**

Decades of research confirm that there are significant returns to investments in schooling. Returns decline by level of schooling and the country's per capita income. Rates of return to schooling are very high in low- and middle-income countries. Country circumstances differ, but, in general, in economies with less than universal primary education, rates of return are greatest for primary education (Psacharopoulos, 1994).

Reaping returns from schooling investments requires that the scope for productive learning be expanded through either technical innovation or changes in markets and political regimes. Schooling improves productivity in the workplace and in the household by improving the ability to learn. The introduction of new technologies can raise the returns to schooling if the new technology increases rather than decreases the scope for learning or input misuse. The 'green' revolution exemplifies a case in which there was an increased premium placed on learning or information acquisition. The new, high-yielding imported seed varieties that were the engines of growth of the green revolution were significantly more sensitive to the use of such inputs as water and fertilizer. Learning about the appropriate allocation of inputs under a new-technology regime was a new challenge to farmers formerly engaged in 'traditional' farming practices that had large potential payoffs, and the continuing introduction of new seeds every few years may have raised the returns to skills in information decoding (Rosenzweig, 1995). Thus, returns to schooling are made possible through complementary investments.

In the 1980s, due to an increase in the demand for more-educated workers, the more educated have improved their position in developed countries despite an increase in their numbers. This caused an overall increase in the returns to schooling. This reversed the 1970s trend of declining rewards for higher education and falling rates of return to

schooling in several developed countries. This occurred at a time when earnings inequality is growing at unprecedented rates and the average level of schooling in the labour force is very high (see, for example, Levy & Murnane, 1992). Therefore, changes in markets led to an increase in the demand for educated labour large enough to absorb increases in the supply of educated labour, leading, in turn, to an increase in the returns to schooling.

Major changes in a country, such as the transition from central planning to a market economy, should result in greater gains to those with more education and a more general education. Empirical analysis of changes in the wage structure in Slovenia between 1987 and 1991 reveals that the average private returns to schooling rose dramatically during the transition (Orazem & Vodopivec, 1995).

## Rationale for public finance

Despite high rates of private returns to investments at all levels of education, which alone justify large investments by individuals, there are good reasons for public intervention. These include complementarities—between the public and private sectors, between different aspects of human capital, and between human and other capital investments, externalities and equity.

### COMPLEMENTARITIES

*Private—public.* The public role in education is to provide a policy framework that will ensure that overall investment in human capital is maximized. This may necessitate that public investment in human capital is adjusted to permit efficient investment by the private sector. In other words, investment in human capital should be maximized, but the private sector should not be crowded out. As part of public policy, the State should ensure that barriers to private sector involvement in education are removed. The public sector should also provide timely information to students and their families. Parents with little education tend to be less informed than better-educated parents about the benefits or quality of education. In the United Kingdom, working-class parents tend not to encourage their children to aspire to a university education (Barr, 1993). In addition, the public sector can assist in the private purchase of schooling, especially of higher education, which is beyond the means of many poor families. Most credit markets do not provide an effective solution because of strong imperfections that reduce participation, particularly by very poor people. In principle, the budget constraints can be overcome by borrowing, given the high private rates of return to education. However, given the high risks for both borrowers and lenders in educational financing, the State can ensure that loans are available.

*Human capital.* Investments in education have positive impacts on health and fertility indicators. The more educated a woman, the lower her fertility. The more educated the parents, particularly the mother, the lower is maternal mortality and the healthier is the child. Parental education influences child mortality through the use of medical services and changes in household health behaviour.



*Human and physical capital.* While it is well known that investments in physical capital contribute to economic growth, it is also true that complementary investments in skilled labour are needed. In fact, investments in physical capital are not enough (Barro, 1991). By far the single largest contributor to economic growth is primary and secondary education. East Asia's 'miracle' countries were able to sustain growth because of policies that included priority to primary and secondary education. The size of the effect is substantial. Between 58% (Japan) and 87% (Thailand) of predicted growth is due to investment in primary education. If in 1960 the Republic of Korea had had only the low school enrolment rate equivalent to that of Pakistan, by 1985 its GDP per capita would have been 40% lower than that actually attained (World Bank, 1993). The fact that investments in human capital make investments in physical capital more productive has long been recognized in the economic literature (see Griliches, 1969).

#### EXTERNALITIES

The new growth-theory literature recognizes the importance of human capital accumulation. Investments in education facilitate the development of new technologies and are themselves a source of self-sustaining economic growth (Romer, 1986). The benefits of education accrue not only to its direct recipients but also to society at large. In the absence of public finance, expenditures on education are smaller than would be desirable. According to an adaptation of new growth theory, a worker's productivity is affected by the average level of human capital as well as by the worker's own human capital (Lucas, 1988). Attempts to test Lucas' hypothesis have been made and the results are not inconsistent (Winter-Ebmer, 1992; Sakellariou, 1995). Widespread public education at the primary level may provide a threshold for development (Azariadis & Drazen, 1990). The optimal distribution of education for maximizing the spill-over effects associated with human capital and taking advantage of these potential threshold levels would appear to be a distribution that is equitable.

#### EQUITY

Education can reduce income inequality by promoting productivity gains in agriculture and facilitating the absorption of labour into the modern industrial sector. Equality of distribution of education usually results in equality of distribution of income. Education opens new opportunities for the poor and so increases social mobility. Public spending on primary education definitely helps the poor for two reasons. First, because the poor tend to have large families, a larger subsidy accrues to a poorer family than to a richer one. Second, the rich may opt out and buy private education, again increasing the amount of the subsidy that flows to the poor. But not all groups in society can afford the direct and indirect costs associated with investing in education and the State has a role in promoting equality of opportunity. If education were provided under market conditions, only those who could afford to pay tuition fees could enroll. Not only would there be under-investment from the social point of view, but income inequalities would be preserved from one generation to the next, since education is itself a determinant of lifetime income.

## Observed reality

A case for public intervention in education is clear, but in recent years adverse macro-economic conditions and keen inter-sectoral competition for public funds have reduced most governments' ability to continue expanding educational budgets. At the same time, the potential contributions of households are often limited by current financing arrangements. The results are under-investment in education and an untapped willingness of households to pay for education. Current financing arrangements also often result in some misallocation of public spending on education.

Existing evidence on rates of return to schooling suggests that in most developing countries primary education should receive the highest investment priority. The present financing arrangements contribute to the misallocation of resources devoted to education in the sense that the high degree of public subsidization of tertiary education boosts the demand for higher education, a relatively less socially-efficient educational investment. Where public resources are constrained, it is all the more important to allocate them efficiently and equitably. However, the pattern of allocation of public expenditure within the education sector in many countries suggests that this is not so. Scarce public resources are often allocated in favour of higher education at the expense of primary and secondary education. For example, public spending on higher education in Africa is about forty-four times greater than spending per student in primary school, yet only two-thirds of African primary school-age children attend school.

The present incidence of public expenditures on education is unequal. The relatively few individuals who gain access to higher education receive more subsidies (in absolute terms) than those at the lower levels. Moreover, evidence indicates that richer groups are over-represented at all levels of education, but especially at the university level. Present allocation patterns are biased against the rural population and lower income groups. Examples can be found in a number of countries. In China, in the rural areas where over 70% of the population lives and where wages are about half of those of the urban areas, primary education has been financed mainly by parents and the village community through in-cash and in-kind contributions towards teachers' salaries and the construction of school buildings. However, urban primary and secondary schools enjoy financing from the provincial, urban/township or district governments. Universities were free of charge until 1989. In Kenya in the mid-1980s, fees at the secondary level were about 44% of the recurring cost, but higher education was free of charge. In Nigeria in 1993, government expenditure on every university student was about twenty-five times that for each primary pupil and ten times that for secondary pupils in State schools. In French-speaking Africa, almost all higher education students receive outright grants, as well as welfare subsidies, such as health care.

The observed reality goes against the economic justification of public subsidy of education. Concern for efficiency and equity suggests that governments should target public subsidies to primary and girls' education, and that much greater private sector involvement should be sought in the financing of secondary, vocational and technical, and—particularly—higher education.

## Priorities for reform

The World Bank's *Priorities and strategies for education* (1995) calls for six key reforms in educational financing and management, with the order of priority depending on country circumstances. Since the challenges to education are present to varying degrees in individual countries, the six key reforms will not all have the same priority everywhere. These reforms will go a long way toward enabling countries to meet the challenges in access, equity, quality and pace of reform that they face today.

1. *A higher priority for education:* Education is more important than ever for economic development and poverty reduction. Education therefore deserves a higher priority on government agendas—not just those of ministries of education. This imperative has long been recognized in East Asia and is increasingly coming to be understood elsewhere, particularly Latin America. Education alone will not reduce poverty; complementary macro-economic policies and physical investments are also needed.
2. *Attention to outcomes:* Educational priorities should be set with reference to outcomes, using economic analysis, standard setting and measurement of achievement through learning assessments. An approach that looks at the whole sector is essential for setting priorities. The high rates of return estimated for primary education in most developing countries strongly suggest that investments to improve enrolments and retention in primary education should generally have the highest priority in countries that have not yet achieved universal primary education. Some improvements in educational efficiency or quality will often be possible through policy changes that require no specific investments. Countries that have largely achieved universal primary and lower-secondary education are likely to consider upper-secondary and higher education as the priorities, and they can often make informed decisions about these post-compulsory levels through the prudent use of economic analysis focused on labour-market outcomes. It has been shown, for example, that the returns to general secondary education are much higher than those to highly specialized vocational secondary education. Countries that have yet to achieve universal primary education will need to pay attention to all levels of education, using economic analysis to guide decisions about which investments will have the greatest effect.
3. *Emphasis on primary education in public investment:* A more efficient, equitable and sustainable allocation of new public investment on education would do much to meet the challenges that education systems face today. Efficiency is achieved by placing public investments where they will yield the highest returns—usually, for educational investments, in primary education. To achieve equity, the government needs to ensure that no qualified student is denied access to education because of inability to pay. For equity and efficiency, therefore, students and parents should be asked to bear part of the costs of higher education. Governments can also encourage private financing by taking on some of the risk that makes financial institutions reluctant to lend to students entering higher education.
4. *Attention to equity:* Equity has two principal aspects: (a) everyone's right to a pri-

mary education—the basic knowledge and skills necessary to function effectively in society—and (b) the government's obligation to ensure that qualified potential students are not denied education because they are poor or female, are from disadvantaged ethnic minorities or live in geographically remote regions, or have special educational needs. At the lowest and compulsory levels of education, equity simply means ensuring that schools are available. Beyond that, it means having fair and valid ways of determining potential students' qualifications for entry. Achieving equity requires both financial and administrative measures. Financial measures, such as scholarships, are important at all levels to enable the poor to gain an education. Scholarships can cover fees and other direct costs, such as transport, books and school uniforms and, when appropriate, can compensate families for the indirect costs of sending children to school—for example, loss of labour services for the household. Bangladesh and Guatemala have girls' scholarship programmes in which tuition is free and stipends are paid to parents to compensate them for other direct costs and for the loss of their daughters' time. Administrative measures can increase enrolments of the poor, females, linguistic minorities and students with special educational needs.

5. *Household involvement:* Around the world, parents and communities are becoming more involved in the governance of their children's schools. Effective involvement in school governance does not come easily, however, and training is generally advisable. Several countries have a long tradition of parental choice, and increased experimentation with school choice is a worldwide phenomenon. For choice to be effective, the student must have more than one possible school. The institutions should have some distinguishing characteristics—for example: those aspects of the curriculum that are emphasized; in teaching styles; and, at higher levels, in course offerings. Finally, institutions need to enjoy considerable autonomy about how they teach. The availability of a variety of institutions enables parents and students to exercise choice and thus gives institutions an incentive to adapt to demand.
6. *Autonomous institutions:* The quality of education can benefit when schools have the autonomy to use instructional inputs according to the circumstances of the local school and community, and are accountable to parents and communities. Fully autonomous institutions have authority to allocate their resources (not necessarily to raise them), and they are able to create an educational environment adapted to local conditions inside and outside the school. Accountable autonomous institutions can be encouraged by both administrative and financial means. Administrative measures include giving school management the authority to allocate resources—for example, the authority to deploy personnel and to alter such things as the timing of the school day and year and the language of instruction to fit local conditions. Most critically, teachers need to have the authority to determine classroom practices, within limits set by a broad national curriculum. Reliance on local funding must be tempered with adjustments by higher levels of government to compensate for differing resource levels among localities. Local control of resources need not imply local raising of revenues. The goal of local financing of schools should be to improve learning, not to reduce overall resources.

While it has been recognized for some time that expenditures on schooling are an investment, the evidence available today is overwhelming. But while this message has been internalized by developed countries, developing countries are not doing all they can to take advantage of it. By taking the six key education reforms presented here, depending on country circumstances, developing countries can move toward meeting their challenges, take advantage of changes in today's world economy and promote equity. Failure to adjust education systems to the new reality of the world economy will not only leave people in developing countries poorer than they used to be, but may even increase the gap between developing and developed countries.

## Note

1. Paper prepared for the round-table on 'Education, Labour Markets, Development and the World Bank', at the Annual Meeting of the American Economic Association, San Francisco, California, 5–7 January 1996.

## References

- Azariadis, C.; Drazen, A. 1990. Threshold externalities in economic development. *Quarterly journal of economics* (Cambridge, MA), vol. 105, no. 2, p. 501–26.
- Barr, N. 1993. *The economics of the welfare State*. Stanford, CA, Stanford University Press.
- Barro, R.J. 1991. Economic growth in a cross section of countries. *Quarterly journal of economics* (Cambridge, MA), vol. 106, no. 2, p. 407–44.
- Griliches, Z. 1969. Capital-skill complementarity. *Review of economics and statistics* (Amsterdam), vol. 51, no. 4, p. 465–68.
- Levy, F.; Murnane, R.J. 1992. U.S. earnings levels and earnings inequality: a review of recent trends and proposed explanations. *Journal of economic literature* (Nashville, TN), vol. 30, p. 1333–81.
- Lucas, R.E. 1988. On the mechanics of economic development. *Journal of monetary economics* (Amsterdam), vol. 22, p. 3–22.
- Orazem, P.F.; Vodopivec, M. 1995. Winners and losers in transition: returns to education, experience, and gender in Slovenia. *World Bank economic review* (Washington, DC), vol. 9, no. 2, p. 201–30.
- Psacharopoulos, G. 1994. Returns to investment in education: a global update. *World development* (Tarrytown, NY), vol. 22, no. 9, p. 1325–43.
- Romer, P.M. 1986. Increasing returns and long-run growth. *Journal of political economy* (Chicago, IL), vol. 94, p. 1002–37.
- Rosenzweig, M.R. 1995. Why are there returns to schooling? *American economic review* (Nashville, TN), May, vol. 85, no. 2, p. 153–58.
- Sakellariou, C.N. 1995. Human capital and industry wage structure in Guatemala. Washington, DC. (World Bank Policy Research Working Paper 1445.)
- Winter-Ebmer, R. 1992. Endogenous growth, human capital, and industry wages. Linz, Austria, Johannes Kepler Universität Institut für Volkswirtschaftslehre. (Arbeitspapier no. 9206.)
- World Bank. 1980. *Education: Sector policy paper*. Washington, DC.
- . 1993. *The East Asian miracle: economic growth and public policy*. Washington, DC.
- . 1995. *Priorities and strategies for education: a World Bank review*. Washington, DC.

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# TOWARD AN ALTERNATIVE STRATEGY FOR INTERNATIONAL ASSISTANCE TO EDUCATION<sup>1</sup>

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Noel F. McGinn

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*Priorities and strategies for education: a World Bank review* (World Bank, 1995; hereafter the *Review*) is the most recent in a series of documents published by the World Bank describing its policies with respect to loans for educational projects in developing countries. The *Review* makes a strong case for continued efforts to improve education. To accomplish this, it recommends increased spending on public education and the expanded use of research-based knowledge to identify effective policies. The *Review* goes further, prescribing specific policies that the World Bank will support. Finally, the *Review* calls for increased participation by national stakeholders in the formulation of educational policies, and co-ordination of the activities of international assistance agencies. These recommendations constitute a strategy for international assistance to education.

The central axis of the *Review's* strategy—increased use of research to inform policy making—is highly laudable, but the means proposed to accomplish this aim make realization of other objectives, particularly national participation in policy formulation, unlikely. The first section of this paper summarizes the *Review* and identifies the weaknesses of its argument. The second section of the paper proposes an alternative strategy for international assistance to education that is more likely to achieve the worthwhile objectives set out in the *Review*.

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## The content of the *Review*

Independent of the validity of its recommendations, the *Review* is an important document and merits extensive discussion and debate. The *Review* makes a strong case for renewed commitment to education, because access to it is a basic human right and because it contributes to economic and social development. It calls for increased resources for education, and a more equitable distribution of access to schooling. And it urges continued efforts to improve the quality of instruction.

Previous proposals for education in developing countries have been cloaked in the cautious interpretations that social scientists make of ambivalent and ambiguous research findings (Chapman & Carrier, 1990; Hallak, 1990; Lockheed & Verspoor, 1990; McGinn & Borden, 1995), and this is true of earlier policy papers by the World Bank and other international and bilateral assistance agencies. The current document is a bold statement that announces clearly and unequivocally its positions and how they will be promoted. The authors are clear: the World Bank will reward countries that conform to its policies. For example, with respect to higher education it states:

Countries prepared to adopt a higher education policy framework that stresses a differentiated institutional structure and a diversified resource base, with great emphasis on private providers and private funding, will continue to receive priority (p. 136).<sup>2</sup>

The *Review* is distinct from earlier documents in its more explicit attention to policies to achieve proposed reforms. The six key reforms proposed in the *Review* go beyond usual recommendations to increase the internal and external efficiency of public education systems. Chapter 11 of the *Review* discusses 'the political and social context of change' and names the social actors the authors consider as obstacles to positive change. Strategies are proposed to weaken those actors and strengthen others that, the authors believe, are more likely to provide the kind of education that is sought.

The principal offenders, said to have 'vested interests' (p. 135), are national governments, teachers' unions, the elite and university students. Central governments protect their interests 'at the expense of parents, communities, and the poor' (p. 137). Teachers' unions resist attempts to change the conditions under which teachers work. Although they act with 'the best of intentions' (p. 138), their efforts to build an equitable education system have taken power away from parents and communities. Higher education students protest to protect their educational subsidy, which disadvantages the poor enrolled in under-financed public primary schools. To overcome these obstacles, the *Review* offers several strategies intended to strengthen the relative power of parents and communities vis-à-vis the central government and the other stakeholders. These strategies include autonomy of educational institutions from the central government, and active participation by households.

Community and parent control, when accompanied by measures to ensure equity in the provision of resources, can offset much of the power of vested interests, such as teachers' unions and the elite (Burnett, 1996, p. 140).

These recommendations are a radical departure from the World Bank's prior efforts at avoiding politics at all costs (Psacharopoulos, 1986).

For all its strengths, however, the *Review* is not totally coherent, and adopts positions that appear to be logically inconsistent. A detailed examination of some of those inconsistencies sets the stage for an alternative strategy to achieve the *Review's* positive objectives.

## Critiques of the *Review*

The document has been extensively critiqued (Bennell, 1996; King, 1995; Lauglo, 1996; Samoff, 1996b). In addition, many of the recommendations repeated from previous documents (World Bank, 1990; World Bank, 1991; World Bank, 1994) have been criticized elsewhere (Bracho, 1992; Buchert & King, 1995; Colclough, 1996; Jones, 1992; Lauglo, 1992; Puiggros, 1996; Samoff, 1993; Zideman & Albrecht, 1995).

Some of the observations directed toward the *Review* may also fit policies of some other international assistance agencies. If there is a fit, then the *Review* can be said to continue the efforts of the World Bank and other international and bilateral organizations to institutionalize 'a uniform ideology, structure, and practice by nation-states' in the provision of education (McNeely, 1995, p. 484). This is unfortunate as uniformization of policy recommendations for education reduces opportunities for the world community to learn from varied experience.

Some of the critiques question specific policy recommendations made in World Bank documents. These include proposals to emphasize cognitive learning in primary schools, reduce attention to pre-service teacher training, decentralize management of primary and secondary education, reduce public funding of secondary-level vocational and technical training, and implement cost-recovery schemes for upper secondary and higher education. In brief, the critiques call attention to insufficient empirical support; excessive generalization from the data; and use of a limited model of 'education'.

### INSUFFICIENT EMPIRICAL SUPPORT

For the most part, the complaint is not that the policies recommended have proved to be wrong, so much as that the evidence to support them is insufficient or contradictory. The *Review*, for example, argues that 'educational institutions may be more accountable for their performance when households are more closely involved in the institutions that family members attend' (p. 120). No research is cited to support this statement: reference is made to a study that suggests that competition between schools enhances characteristics associated with effectiveness, such as leadership (p. 124). The *Review* then asserts that 'educational quality can increase when schools are able to use instructional inputs according to local school and community conditions and when they are accountable to parents and communities' and, in the same paragraph, that schools 'must be autonomous' in order to make effective use of instructional inputs (p. 126). Then the *Review* summarizes the results of experiments with autonomy in three countries: 'there is still little evidence available on how the increased school-



level flexibility that has resulted from autonomy has affected overall quality' (p. 134).

Various critiques of the *Review* (and earlier documents) provide other instances of proposals unsupported by evidence. Lauglo, for example, notes that the *Review* emphasizes natural science in the primary school curriculum, even though there is no evidence that science education at this level makes any more contribution to economic growth than does moral education (Lauglo, 1996). Samoff points out that the impact of class size (student/teacher ratios) on learning outcomes is mediated by so many other factors (for which little or no research is available) that it makes no sense to make a general recommendation for shifting resources away from teacher salaries toward textbooks and in-service training (Samoff, 1996b).

The point made here is not that the World Bank should avoid stating beliefs for which it has little empirical evidence. Science and human understanding advance by stating opinions, by attempting explanations for which we do not yet have adequate evidence. But that advance depends on submitting opinions to rigorous tests, by deliberately seeking alternative explanations for what is observed. If carried out, the *Review's* insistence on implementation of the World Bank's opinions would reduce the likelihood of learning about more effective alternatives.

#### DATA SIMPLIFICATION

The *Review* proposes a comprehensive strategy for the improvement of human society through improvements in education. This is a difficult task to accomplish in 156 pages. It is especially difficult as the authors have chosen an inductive approach for the presentation of their argument. The *Review* attempts to construct a coherent view of the production of educational outcomes by picking through a *mélange* of studies of highly varied quality, carried out in different contexts and time. The authors deny bias in the selection of findings, and note that the *Review* 'relies on previous World Bank policy papers, which were based on the results of years of research and review of the literature' (Burnett & Patrinos, 1996, p. 274).

Years of research have produced, however, an enormous volume of conflicting results. Three devices are used to simplify the problem of too much and conflicting 'data'. First, the authors insist on 'economic analysis', which when 'applied to education, focuses on the assessment of benefits and costs, for individuals and for society as a whole' (p. 95). This preference allows the authors to exclude the vast majority of world research on education which either ignores outcomes or costs or is not quantitative. Much is thrown out in the bathwater, as economic analysis has barely begun to enlighten the most critical issues in education (Heyneman, 1995). Presumably the authors of the *Review* would welcome this recognition, especially when it comes from within their own ranks, that there are many important questions about education for which economic analysis has not yet been completed. This is the implication of their use of Samoff's comment that:

the economics of education plays an important [leavening] role in discussions of education policy and policy making. Asking 'what does it cost' and 'how can that cost be paid' requires proponents of particular courses of action to relate their broad visions to practical details (Burnett & Patrinos, 1996, p. 274, originally written by Samoff, 1996b, p. 256).

A second device for data simplification used in the *Review* is to resolve apparently conflicting results at one level by aggregating data to the next highest level (Bennell, 1996). For example, in some countries higher education has higher rates of return than does primary education. Aggregation of data to the regional level supports a proposal that priority be given to primary education. Studies on the 'determinants of effective learning [sic] at the primary level' (p. 82) are summarized by the percentage of studies showing positive effects. This practice leads to the possibility that policy proposals are determined by the accident of which countries were studied. The *Review* notes that the 'exact composition of the basket of inputs and their relative importance for a given school will vary widely in accordance with local conditions' (p. 81), but insists on generalizing to recommend specific inputs over others. In their response, the authors attribute the apparent contradictions to a desire for simplicity, and then go on to criticize Bennell's data, implying that it lacks analytical rigour.

#### USE OF A LIMITED MODEL OF 'EDUCATION'

A third device for data simplification is the narrow, implicit restriction of education to the modern school and efforts at improvement to modification of current practices. Almost all the proposals made in the *Review* are about how to make the existing education systems of developing countries more effective. The *Review* takes the 'school' model as the only and/or best method by which 'education' or 'human capital formation' does or can occur. It recommends improvement of the technology of instruction based on a fixed curriculum delivered by a formally trained teacher using specially designed texts or textbooks, in special rooms or buildings separated from other spheres of human activity. Learning outcomes will be raised by more effective use of inputs and management processes, not by radical changes in our understanding of how learning occurs.

Loss of faith in 'schooling' as the most effective form of education appears not just in the United States but also in developing countries who are convinced that the form of education imported through colonialism and reinforced with current forms of international assistance is basically flawed (for example, see Reich, 1991; Elmore & McLaughlin, 1988; Schiefelbein & Tedesco, 1995).

Alternative forms of education or technologies of instruction are not discussed, neither as a possibility nor as they are being developed today in both rich and poor countries. No reference is made, for example, to the growing research literature describing experiments with co-operative learning, constructivist curricula and experiential learning. The *Review* is silent with respect to how the forces of globalization demand new kinds of education to meet these demands. Its policy recommendations, if followed, would commit countries to more of the model appropriate for a previous age. Even if, as their response to criticisms suggests, the authors wished only to suggest topics on which rigorous analysis should be carried out, their choice of topics constricts the policy options they present.

## The *Review's* strategy for international assistance

The strategy implied in the *Review* is divided into two parts: the source of policies to be implemented; and the mobilization of support for those policies. With respect to the former, the World Bank will provide assistance to countries prepared to accept the recommendations made in the *Review* (and presumably other World Bank documents not in contention) derived from economic analysis of data in the academic and policy-oriented literature. This 'literature' consists primarily of studies by World Bank staff or commissioned by the Bank. In sum, the World Bank will support policies it has identified.

The language of the second part of the strategy is relatively new for the World Bank. The *Review* recognizes education as 'intensely political' (p. 13), and therefore proposes a political strategy to overcome resistance (by the vested interests noted earlier) and to 'ease change' (p. 14). This requires mobilization of stakeholders in education other than central government, university students, teachers' unions and the elite. The *Review* urges countries to build national consensus to accomplish four objectives: expansion of private education; increased cost-sharing in higher education; increased involvement of parents and communities; and 'careful design of reform measures' (p. 14).

No empirical or theoretical justification is offered for World Bank attention to the political context, nor is the *Review* clear on how it will be brought about. If governments have 'vested interests', as one of the accused they might well regard the Bank's proposals as subversive. 'Parents and communities' are amorphous as political actors. NGOs are mentioned favorably in the *Review*, as is the private sector, but these are complex social aggregations whose members often have conflicting objectives.

The *Review* proposes that the World Bank function more than as a mere source of funds but, instead of a 'development advisory service', using policy analysis as the basis for dialogue with governments seeking assistance: 'the World Bank's main contribution', it says, 'must be advice, designed to help governments develop education policies suitable for the circumstances of their countries' (p. 14).

The key issue is *how* the Bank will 'advise' governments on suitable educational policies. It is clear what the *Review* thinks governments *should* do:

Educational priorities should be set with reference to outcomes, using economic analysis, standard setting, and the measurement of achievement through learning assessments (Burnett, 1996, p. 218).

*Who* will specify preferred outcomes and set priorities? The *Review* is silent on how governments (and communities and parents and NGOs) will increase their capacity to assess policy options. Given the assurance with which the *Review* identifies priorities, it is reasonable to expect that World Bank staff or their consultants will attempt to persuade governments to accept the Bank's position. Policies will have to be adjusted to the context of each country, but that adjustment will rely principally on external advisors. Will the 'advice' be in the form of 'Do what we recommend or no loan', as the *Review* suggests? If so, it will continue the practice of policy dialogue as 'persuasion', in which powerful international assistance agencies compel dependent governments to accept their advice (Mayer, 1990).<sup>3</sup>

## FUNDAMENTAL CONTRADICTION

This tension, between the *Review's* call for broader social participation in national decision-making and its insistence on an externally-determined set of priorities, poses a fundamental contradiction. The authors of the *Review* are caught on the horns of a dilemma. If they insist on the primacy of economic analysis and the inexorable sequence of its logic, then why is local participation necessary, except to weaken the ability of the government and its allies to resist the Bank's recommendations? If local participation is valued for something other than ventriloquism (Lauglo, 1996, p. 221), and if local autonomy includes autonomy from the World Bank, then the power of 'economic analysis' essentially may be wasted. Put in other terms, by insisting on the inescapable progression of the logic of its recommendations (based on economic analysis) the *Review* sets the World Bank up to be in a position equivalent to that of autocratic central governments dealing with local communities.<sup>4</sup>

The *Review's* willingness to impose its perspective can be contrasted with the delicate sensitivity of the Government of Japan with respect to aid for education.

Because education is an area where values, morality, aspirations to national unification, culture and sovereignty are involved, it is difficult for Japan actively to enlarge the scope and enrich the content of its aid for education (King, 1997, p. 118, quoting a report of the Japan International Cooperation Agency—JICA, 1994, p. 37).

Perhaps the authors of the *Review* meant only to expand the range of information included in a national decision-making process. In their responses to criticisms, they claim that the *Review* assumed that 'public policies ought to reflect the political will of a community (and) clearly values and goals, not tools, are their foundation' (Burnett & Patrinos, 1996, p. 275, quoting Samoff, 1996b, p. 252). The *Review* notes, however,

the importance of considering the economic perspective in this. We accept the importance of values. If that is how decisions are made, then fine, just as long as the cost implications are known and the process is transparent (Burnett & Patrinos, 1996, p. 275).

Presumably values would surface and be clarified by broadening the participation of stakeholders in policy formulation. The *Review* comments favourably on processes of broadened participation in three countries, through 'national consensus building', but provides no suggestions on how the World Bank and externally-funded research should support such processes, nor how to handle contradictions between nationally-generated policies and what the Bank's analysis has determined are suitable.

Even if it were possible for the *Review's* priorities to be 'correct' for a given country,<sup>5</sup> reliance on externally-generated economic analysis further reduces the decision-making capacity of the government (with or without the participation of other stakeholders) to identify policies. More importantly, continued dependence on external 'advice' increases the likelihood that policies will not be implemented (Leach, 1997). Evaluation of economic reform efforts indicates 'that donor involvement in those processes

has been far too “front-end loaded”, focusing on analysis and conditionality, while much of the difficulty . . . came after analysis was completed’ (Gordon, 1996, p. 1,534).

## **An alternative strategy for international assistance to education**

The strategy proposed here includes elements intended to *increase* the range of policy options from which governments (and national communities) can choose, to *de-link* funding from identification of policy options, and to *involve all stakeholders* in the process of policy formulation. The strategy seeks to reduce the external control over policies that results from current patterns of international assistance, and to maximize the quality and effectiveness of national education policies.

### THREE STRATEGIES TO INCREASE THE VARIETY OF POLICY OPTIONS

First, international agencies can encourage their own staff to develop alternative perspectives on education and how it should be delivered. Agencies, such as the World Bank, are large enough to develop, within their organization, centres of new thinking on education that challenge the existing model of schooling and conventional wisdom about how education contributes to development. This de-linking would provide technical assistance personnel with access to research not constrained by the paradigm dominant in that agency. For example, in Canada, policy analysis and broad development research is commissioned by the International Development Research Centre, while analysis specific to the details of a given project is funded by the Canadian International Development Agency. In Germany, one agency handles training and institutional capacity building, while another funds technical assistance projects.

Second, international assistance agencies can commission research externally, choosing university and other research centres in the developed countries with the objective of increasing alternative perspectives. This strategy is preferred to the first as it is easier to develop and maintain alternative perspectives among competing universities and detached research centres than it is to develop a ‘free market of ideas’ within an agency.

Third, the development of autonomous national capacity for decision-making can be made a primary objective in all educational projects. National participation in decision-making will be greatest when requisite knowledge is produced nationally. Locally-produced knowledge is not only much cheaper than that produced by expatriate researchers, it can be of much greater relevance given national values and political realities. Almost all countries now have some capacity for educational research, although in many countries it is limited in volume and quality. A shift in funding from agency-generated research to nationally-generated research would, over time, rectify this problem.<sup>6</sup>

### A STRATEGY TO DE-LINK ASSISTANCE FUNDING FROM POLICY CHOICE

The logic behind conditionality is a reasonable desire by international assistance agen-

cies to ensure that funds are well-spent. The agencies require some way to guarantee that governments will follow through on their agreements.

Unfortunately, the linking of funding to intervention by international agencies contributes to a further weakening of the recipient states. Continued involvement of international agencies in national decision-making maintains dependency and weakens public institutions. Without competent governments, democratic institutions do not flourish, and the cycle of decay continues.

What is required is some way to provide international assistance for education, while requiring at the same time national governments and organizations in that civil society to develop and demonstrate moral and financial responsibility. The type of international assistance provided should be that which: (a) contributes to increasing the legitimacy of public institutions; (b) builds a relationship of trust between agencies and recipients; (c) makes funds available to local as well as to national organizations; and (d) reduces the control that agencies feel obliged to exercise over project preparation and implementation.

One means to accomplish this is the proposed *autonomous development fund*, the nature and experiences of which are described in *Development dialogue* (Uppsala, Sweden, Dag Hammarskjöld Centre), number 2, 1995. A detailed proposal for a fund of this kind for Africa is advanced by Hyden (1995).

Autonomous development funds are intended to de-link specification of policy options from the funding of development projects. They provide mechanisms to ensure financial accountability, disburse development funds to local as well as to central governments, encourage innovation in policy initiatives and develop national autonomy.

Development funds are not new, but existing versions suffer critical faults. Rural funds established by assistance agencies in the 1970s allowed governments to support small projects without going through the bureaucracy. These funds typically had no oversight mechanism and became patronage devices. Most have been abandoned. International private foundations have created local counterparts, again for the purpose of financing local development initiatives. They are active in a number of countries, especially in Latin America and Asia. These are more formally structured but still are often 'captured' by local actors for a political agenda. Some assistance agencies, such as UNDP and UNICEF, have created public sector foundations, often politically accountable to a single government official but relatively autonomous in operation. The fourth kind of fund is that established with World Bank financing to ameliorate the effects of structural adjustment. The *Review* refers to the Social Fund in Bolivia which is responsible to government officials and operational, i.e. it actually carries out projects.

The *autonomous* development fund has these characteristics:

1. Although public, it is autonomous with regard to the government, and therefore less subject to serving narrow political interests.
2. It can support both public and private sector (NGO or civil society) projects, which permits it to pursue a comprehensive development strategy.
3. It provides money but does not carry out operations. This permits a focus on analysis.
4. It receives financing from a variety of sources, which protects it from excessive pressures from international stakeholders.

5. It is national (rather than sub-national) and therefore can contribute to a comprehensive development project.

The fund stands between national governments and the civil society and the international organizations.<sup>7</sup> It is managed by a board of trustees prohibited by charter from political activity. It uses professional criteria in decisions to finance projects, but initiatives are generated by national, central and local organizations. International organizations can withdraw their support if the fund does not live up to its charter.

The implementation of this strategy would involve the following steps: (a) international assistance agencies agree to fund development initiatives by national governments; (b) boards of trustees and staff of the development funds are trained in policy formulation and assessment; (c) national organizations, both central and local, public and private, are trained in economic analysis and project design and preparation.

#### A STRATEGY THAT USES RESEARCH TO FOSTER NATIONAL DIALOGUE ABOUT EDUCATION

De-linking funding from policy choice will do much to encourage *national* participation in a dialogue about education. A second requirement is the development of broad national support for educational goals and the means to achieve them. In Europe, the term used for 'national dialogue' aimed at consensus building is *concertation* (Kindley, 1992; Schneider, 1987; Sohns, 1989). Schiefelbein and Tedesco (1995) suggest how consensus-building efforts should be used in Latin America to improve education. Networking strategies have been used to increase private sector dialogue with national governments (Orsini, Courcelle & Brinkerhoff, 1996), and to help developing country universities conduct research that is more policy relevant (McGinn, 1996).

What is missing in this literature is an indication of how the process of research can contribute to consensus building. This research should not be limited to the evaluation of existing options. Instead, research should contribute to the design of new options, and the assessment of the likely consequences of their implementation. Emphasis should be on innovation, and on construction or production of knowledge rather than just on its distribution. These perspectives are described in detail in Senge (1990) and in Gibbons et al. (1994).<sup>8</sup> This kind of research *requires* extensive participation by each stakeholder to evaluate the probability of realization of each situation in terms of resources and political will. The objective is a process of conflict resolution that gives voice to disadvantaged groups in society.

Some recent experiences in Latin America suggest a very different role for research and researchers than that implied in the *Review* (Reimers & McGinn, 1997). In both cases, in El Salvador and Paraguay, expatriate researchers, funded by international agencies (USAID and the InterAmerican Development Bank), first organized advisory groups from representatives of all major stakeholders in education. These groups held strong and often opposing positions on major political issues. The expatriate researchers had two major functions: to maintain a perception by all participants that the process was fair, that is, not biased in any direction; and to focus the participants' discussion on actual problems and opportunities in education.

In El Salvador, the advisory group had fifty members, representing public and private sector corporations, the universities, teachers' unions, political parties, NGOs and the military, as well as the ministries of education, planning and finance and the Congress. The Advisory Group met weekly with representatives of a technical group responsible for carrying out empirical studies of the education system, for a period of three months. Most of the researchers were from national institutions, both universities and private research centres. The weekly meetings dealt with all aspects of the research, beginning with the major research questions, and later including discussions of data collection and analysis procedures.

The Advisory Group then developed a plan for disseminating the findings in reports prepared in Spanish. Presentations were made to candidates in the Presidential campaign underway, senior officials of the Ministry of Education, senior officials of the Ministry of Planning, members of the teachers' union, the Chamber of Commerce, university professors, and representatives of the press, radio and television.

The assessment had a great impact on discussion of the nation's education. Less than a month after the presentation of the findings, the Minister of Education announced a modification to the curriculum of secondary education and began to implement a programme of administrative decentralization along the lines suggested in the assessment. A private business group actively lobbied Congress to prepare a law creating a national institute of technical training. Several organizations in the country produced their own reports on the problems of the education sector and on possible solutions. A think-tank on economic and social policy produced a policy brief on education and human resources, and sponsored several paid pages in the national press about problems and options to improve educational opportunities.

In Paraguay, also, it was possible to achieve a high level of public participation in dialogue about critical issues in education. A team of foreign advisors created a strategic advisory group involving top Ministry of Education officials and the education reform commission. A small policy-analysis group was organized, including national and expatriate consultants and technical staff in the Ministry of Education. The first meetings of the strategic dialogue group focused on defining the mission of the group, and the procedures it would follow. The group then met with the policy analysis group to outline the kinds of reports that would be useful. Each report used ministry statistics and other research reports to describe current issues in an education sub-sector (e.g. technical education), ongoing activities and other kinds of activities the sub-sector could carry out. Five months later, the group had read through and discussed more than 2,000 pages of reports reviewing information about the current system and about innovations in education in other contexts. The group summarized their conclusions in a report called 'A proposal for dialogue'.

The 'Proposal' was discussed in meetings held in twenty cities and towns around the country. These were co-ordinated by members of the strategic dialogue group, attended by an average of thirty persons each, and lasted between four and sixteen hours. Those participating represented different ministries (finance, planning, health), all education supervisors and teachers' union leaders, state governors and mayors, political leaders, members of congress, representatives of non-governmental organizations, university presidents and administrators, church and social leaders, representatives of private schools,



business leaders and other groups. Similar meetings were held in schools. Participants were urged to use the material to hold further discussions with other groups.

The Paraguayan dialogue is still underway. What is clear at this stage is that more discussion is occurring there about education than at any time in its history. Sectors of society that were never before consulted about their opinions are now active participants in a national discussion about what kind of education to construct.

#### THE ROLE OF ANALYSIS

In these two cases, 'research' almost disappears from view. The empirical findings clearly were important in stimulating dialogue between groups, but the process set in motion soon went far beyond the 'research' results themselves. The important outcomes of this action research are not precise findings about the status of the education system, but instead the decisions of the stakeholders to change that status. The process required high-quality social science research, but not to produce universally valid truths. What was important was the legitimacy of the process in the eyes of the stakeholders. This legitimacy required, on the one hand, that the researchers maintain their professional integrity in applying their disciplines, but, on the other hand, that the process of the research be responsive to the stakeholders.

### **Conclusion: the elements of an alternative strategy for international assistance to education**

The strategy has three essential elements:

1. Information generated through research is used to increase the range of policy options available to countries.
2. Funding of projects is de-linked from both the provision of information about policy options, and from the operational implementation of assistance.
3. Government choices among policy options are made following national discussion involving all stakeholders in the society (but without the participation of international assistance agencies).

International assistance agencies continue to play a critical role in this strategy, but it is different from the role described in the *Review*. Agencies shift from a position of expertise in the identification, evaluation and restriction of policy options, to facilitation of the capacity of national and international organizations to design, compile and evaluate policy options. Institutional development and capacity building is not a new concept for the World Bank or for other agencies, but in the *Review* it does not occupy a prominent position. The strategy proposed here suggests that the World Bank and other agencies can function as development advisory services, but only if national capacity building is taken as the major priority of their services.

In this strategy, agencies continue to provide funds for development, as loans or as grants, but their evaluation of the utilization of those funds is not in terms of the means pursued by the recipient countries, but instead in terms of long-term consequences. Agencies

no longer intervene in the choice of policies for development. Their decisions to make grants or loans are based on their assessment of the recipient's competence and on a relationship of trust, and not on the recipient's conformity to the agency's preferred policy.

This strategy calls for true collaborative efforts, in which funds from different agencies can be commingled in autonomous development funds, eliminating comparisons across agencies in terms of their operating styles and policy ideologies, pooling resources and especially knowledge, and providing recipient countries with a more consistent assistance environment.

## Notes

1. In the preparation of this paper, I was greatly helped by Charles Abelmann, Erwin Epstein, Kenneth King, Steven Klees, Joel Samoff and James Williams, none of whom bear responsibility for its faults.
2. Unless otherwise indicated, all page numbers in parentheses refer to the *Review*.
3. For the difference in practice between policy dialogue as persuasion, as negotiation and as participation and organizational learning, see Reimers & McGinn (1997).
4. King notes that: 'What is rarely acknowledged in these very firm policy priorities adopted by the Bank is just how contested the argumentation frequently is. This air of certainty . . . would be very problematic in an academic paper, but in a policy paper distributed worldwide in multiple languages it might seem even more necessary to qualify recommendations with a health warning about the sources, the methodology or the generalizability of the positions being adopted' (King, 1997, p. 116).
5. Broadened national participation in discussions about education will, at least temporarily, increase differences between the positions of various stakeholders. Unless and until a national consensus is achieved, however, no policy will be seen as correct by all groups. The 'country' to which the *Review* refers is an abstraction that obscures conflicts within the society.
6. Although assistance agencies express capacity-building for policy analysis as a primary objective, a large fraction of their budgets is spent on their own staff and expatriate advisors who invade national policies and politics (King, 1992). In the worst case, agencies can be seen as a 'secular god' (Collier, 1994).
7. A review of experiences of NGOs and grassroots organizations (GROs) suggests that direct support by international assistance agencies has a negative impact. Donor support reduces the legitimacy of the NGO or GRO, and distracts them from service to local clients: 'it may be better to channel official donor funds to NGOs and GROs via an independent public institution which can protect them from undue donor influence' (Edwards & Hulme, 1996, p. 969).
8. Also helpful are studies on action and participatory research (see, for example, Whyte, 1991; Zuber-Skerritt, 1991).

## References

- Argyris, C. 1980. *Inner contradictions of rigorous research*. New York, Academic Press.
- Argyris, C.; Schon, D.A. 1996. *Organizational learning II: theory, method, and practice*. Reading, MA, Addison-Wesley.

- Ayres, R.L. 1984. *Banking on the poor: The World Bank and world poverty*. Cambridge, MA, MIT Press.
- Bennell, P. 1996. Using and abusing rates of return: a critique of the World Bank's 1995 Education Sector review. *International journal of educational development* (Tarrytown, NY), vol. 16, no. 3, p. 235–48.
- Bracho, T. 1992. *El Banco Mundial frente al problema educativo: un analisis de sus documentos de politica sectorial* [The World Bank and educational questions: an analysis of sectoral policy documents]. Mexico, DF, Centro de Investigación y Docencia Económica.
- Buchert, L.; King, K., eds. 1995. *Learning from experience: policy and practice in aid to higher education*. The Hague, Centre for Studies on Education in Developing Nations. (CESO paperback, no. 24.)
- Burnett, N. 1996. Priorities and strategies for education—a World Bank review: the process and the key messages. *International journal of educational development* (Tarrytown, NY), vol. 16, no. 3, p. 215–20.
- Burnett, N.; Patrinos, H.A. 1996. Response to critiques of 'Priorities and strategies for education: a World Bank review'. *International journal of educational development* (Tarrytown, NY), vol. 16, no. 3, p. 273–76.
- Chapman, D.W.; Carrier, C.A., eds. 1990. *Improving educational quality: a global perspective*. Greenwich, CT, Westview Press.
- Colclough, C. 1996. Education and the market: which parts of the neoliberal solution are correct? *World development* (Tarrytown, NY), vol. 24, no. 4, p. 589–610.
- Collier, P. 1994. From critic to secular god: the World Bank and Africa: a commentary upon 'Sub-Saharan Africa: from crisis to sustainable growth'. *African affairs* (Oxford, U.K.), vol. 90, no. 358, p. 111.
- Edwards, M.; Hulme, D. 1996. Too close for comfort? The impact of official aid on nongovernmental organizations. *World development* (Tarrytown, NY), vol. 24, no. 6, p. 961–73.
- Elmore, R.F.; McLaughlin, M.W. 1988. *Steady work: policy, practice and the reform of American education*. Santa Monica, CA, Rand.
- Gibbons, M., et al. 1994. *The new production of knowledge: the dynamics of science and research in contemporary societies*. London, Sage Publications.
- Gordon, D.F. 1996. Sustaining economic reform under political liberalization in Africa: issues and implications. *World development* (Tarrytown, NY), vol. 24, no. 9, p. 1,527–37.
- Hallak, J. 1990. *Investing in the future: setting educational priorities for the developing world*. Paris, UNESCO: International Institute for Educational Planning.
- Heyneman, S.P. 1995. Economics of education: disappointments and potential. *Prospects* (Paris, UNESCO), vol. XXV, no. 4, December, p. 559–83.
- Hyden, G. 1995. Reforming foreign aid to African development: a proposal to set up politically autonomous development funds. *Development dialogue* (Uppsala, Sweden, Dag Hammarskjöld Centre), no. 2, p. 35–52.
- Japan International Co-operation Agency (JICA). 1994. *Study on development assistance for development and education*. Tokyo, The Study Group on Development Assistance for Education and Development, JICA.
- Jones, P.W. 1992. *World Bank financing of education: lending, learning and development*. London, Routledge.
- Kindley, R.W. 1992. *From class conflict to class cooperation: the evolution of Austrian concertation*. Minneapolis, MN, Center for Austrian Studies.

- King, K. 1992. The external agenda of aid in internal educational reform. *International journal of educational development* (Tarrytown, NY), vol. 12, no. 4, p. 257–64.
- . ed. 1995. *NORRAG news*, no. 18. (Entire issue.)
- . 1997. Aid for development or for change? A discussion of education and training policies of development assistance agencies, with particular reference to Japan. In: Watson, K.; Modgil, C.; Modgil, S., eds. *Educational dilemmas: debate and diversity. Volume 3: Power and responsibility in education*, p. 112–23. London, Cassell.
- Lauglo, J. 1992. Vocational training and the bankers' faith in the private sector. Essay review of 'Vocational and technical education and training: a World Bank policy paper'. *Comparative education review* (Chicago, IL), vol. 36, no. 2, p. 227–36.
- . 1996. Banking on education and the uses of research. A critique of World Bank priorities and strategies for education. *International journal of educational development* (Tarrytown, NY), vol. 16, no. 3, p. 221–33.
- Leach, F. 1997. International aid to education: why projects fail. In: Watson, K.; Modgil C.; Modgil, S., eds. *Educational dilemmas: debate and diversity. Volume 3: Power and responsibility in education*, p. 89–100. London, Cassell.
- Lockheed, M.; Verspoor, A. 1990. *Improving primary education in developing countries: a review of policy options*. Washington, DC, World Bank.
- Mayer, O.G. 1990. Policy dialogue between multilateral institutions and developing countries. *Intereconomics: review of international trade and development* (Hamburg, Germany), no. 25, p. 163–70.
- McGinn, N.F., ed. 1996. *Crossing lines: research and policy networks for developing country education*. Westport, CT, Praeger.
- McGinn, N.F.; Borden, A. 1995. *Framing questions, constructing answers: linking research with policy for developing countries*. Cambridge, MA, Harvard Institute for International Development.
- McNeely, C.L. 1995. Prescribing national education policies: the role of the international organizations. *Comparative education review* (Chicago, IL), vol. 39, no. 4, p. 483–507.
- Orsini, D.M.; Courcelle, M.; Brinkerhoff, D.W. 1996. Increasing private sector capacity for policy dialogue: the West African enterprise network. *World development* (Tarrytown, NY), vol. 24, no. 9, p. 1,453–66.
- Psacharopolous, G. 1986. The planning of education: where do we stand? *Comparative education review* (Chicago, IL), vol. 31, no. 4, p. 560–73.
- Puiggros, A. 1996. World Bank education policy: market liberalism meets ideological conservatism. *Report on the Americas* (New York), vol. 29, no. 6, p. 26–31.
- Reich, R.B. 1991. *The work of nations*. New York, Vintage.
- Reimers, F.; McGinn, N. 1997. *Informed dialogue: using research to shape education policy around the world*. Westport, CT, Praeger.
- Samoff, J. 1993. The reconstruction of education in Africa. *Comparative education review* (Chicago, IL), vol. 37, vol. 2, p. 181–222.
- . 1996a. Chaos and certainty in development. *World development* (Tarrytown, NY), vol. 24, no. 4, p. 611–33.
- . 1996b. Which priorities and strategies for education? *International journal of educational development* (Tarrytown, NY), vol. 16, no. 3, p. 249–71.
- Schiefelbein, E.; Tedesco, J.C. 1995. *Una nueva oportunidad: el rol de la educación en el desarrollo de América Latina* [A new opportunity: the role of education in the development of Latin America]. Buenos Aires, Santillana.

- Schneider, R. 1987. *Gestión para concertación* [Management by concertation]. Montreal, Agence d'ARC.
- Senge, P.M. 1990. *The fifth discipline: the art and practice of organizational learning*. New York, Doubleday.
- Sohns, R. 1989. *Social concertation and economic policy*. Bonn, Friedrich Ebert Stiftung, Forschungsinstitut.
- Whyte, W.F., ed. 1991. *Participatory action research*. Newbury Park, CA, Sage.
- World Bank. 1990. *Primary education*. Washington, DC.
- . 1991. *Vocational and technical education and training*. Washington, DC.
- . 1994. *Higher education: lessons from experience*. Washington, DC, International Bank for Reconstruction and Development.
- . 1995. *Priorities and strategies for education: a World Bank review*. Washington, DC.
- Zideman, A.; Albrecht, D. 1995. *Financing universities in developing countries*. Washington, DC, Falmer Press.
- Zuber-Skerritt, O. 1991. *Action research for change and development*. Aldershot, United Kingdom, Avebury.

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OPEN FILE

NEW  
TECHNOLOGIES  
IN EDUCATION  
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# EDUCATION AND TRAINING:

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## NEW TECHNOLOGIES AND

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## COLLECTIVE INTELLIGENCE

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*Pierre Lévy*

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### Introduction

In the long-running debate about the impact of new technologies on education, various approaches have been adopted. Much work has been done, for example, on multimedia as teaching aids or on computers as inexhaustible substitutes for teachers (computer-assisted learning—CAL). From this altogether conventional perspective, information technology provides us with teaching machines. Seen from another angle, computers are tools for communication, information retrieval, calculation and the formatting of messages (text, image and sound) to be placed at the disposal of learners.

We are now going to look at the question from yet another angle. The growing use of digital technologies and interactive communication networks has come at a time of radical change in our relationship to knowledge and has itself been part of it. By expanding certain human cognitive faculties (memory, imagination, perception), intelligence technologies redefine their scope, their meaning and sometimes even their nature. The new opportunities for distributed collective creation, co-operative learning and networking afforded by cyberspace call into question the functioning of institutions and the accepted forms of the division of labour.

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*Original language: French*

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Our view, therefore, is that it is not so much a question of doing more of the same thing or of doing it better (in this case, teaching or inducing others to learn) by making use of the potential of technologies, as of understanding that something else is already happening. Our plea is for greater awareness of the cultural transformation taking place—of which the technological revolution is but one facet—and drawing all its consequences for education policies, teaching approaches and a redefinition of the teacher's and pupil's roles. In this context, the use of technologies in education and training is obviously not confined to direct assistance in learning but also encompasses co-ordination, co-operation, guidance, evaluation and management. There must be a deliberate policy to make judicious use of multimedia as part and parcel of the change in civilization by exploiting the most positive aspects of digital technologies in social and human development. What, then, is the best use that can be made of cybertechnologies? We consider that the pooling of memory and intelligence, the sharing of knowledge, the synergy of projects, resources and skills, enhancement of people's image of each other, mutual encouragement of unique characteristics and differences, in a word, *collective intelligence*, is a goal commensurate with the opportunities created by digital communication.

The first part of this article contains an analysis of some salient features of the new relationship to knowledge being created in cyberspace, and this is followed by a general view of the new forms of collective intelligence fostered by digital technology. The second part reviews some of the main difficulties encountered today by education systems, such as costs, student numbers, the speed of changes in knowledge, appropriateness of curricula and relevance to the needs of society, and goes on to propose an open and distance learning approach (ODL) involving new technologies as a step towards solving these problems (at least in part). We conclude by presenting the system of 'knowledge trees', which we consider to be a good example of a comprehensive system for the management of learning and skills evaluation in the service of ODL. In line with the emerging new relationship to knowledge, knowledge trees are inspired by a philosophy of technology in the service of collective intelligence and of collective intelligence in the service of human beings.

## **Cyberspace and the new relationship to knowledge**

The aim of this first section is to point to some present-day changes in our approach to knowledge as a result of the emergence of the new information and communication technologies (NICTs).

We begin by discussing the shift from texts printed on a static medium to the dynamic texts that are to be found in cyberspace, especially in one of the most widely used services of the Internet, the World Wide Web (WWW). The prospect of direct interconnection in real time of documents and of all potential readers and authors heralds a new form of universality, a universality without limits, which is typical of the new cultural situation.

What we are witnessing today with the flow of knowledge through digital networks has led to a loss of bearings, a sense of disorientation, for which a remedy will only be found through resolute participation in the processes of collective intelligence that are developing in cyberspace.



For that reason, our second step will be to raise the question of the enhancement and synergy in real time of the intellectual resources of persons participating in interactive networks, a practice which is developing apace both in business and in the educational field.

#### UNIVERSALITY WITHOUT TOTALITY

Paper fixes a text and establishes its precise location. On this medium, the text is like a small piece of territory with an author who owns it, a beginning, an end, and margins forming borders. By contrast, the www service of the Internet offers us a striking image of the new configuration of information carriers. Unlike a printed page, a web page is a dynamic, open, ubiquitous object connected to a nearly infinite corpus. The nature of text as the traditional medium of knowledge has changed. The term 'page' is used in both cases, but the first is *pagus*, a field that is staked out, possessed, sown with rooted signs, while the second is a flow unit, subject to the constraints of delivery through the networks. Even though it may refer to articles or books, the first kind of page is physically closed. The second, on the other hand, links us technically and immediately to the pages of other documents, scattered all over the world, which themselves refer to other pages, and so on indefinitely to other drops in the same world ocean of fluctuating signs.

A web page is a component part of the elusive corpus of all the documents available in this facility. But, through the links that it throws out to the rest of the network, through the crossroads and bifurcations that it proposes, it also selects, organizes, structures and filters that corpus. Each component of this limitless web represents both an information package and an aid to navigation, part of the stock and a specific point of view about that stock. On one hand, the web page is a droplet in an elusive expanse; on the other, it affords a unique filter for the ocean of information.

On the web, everything is on the same plane. Yet everything is discrete. There is no absolute hierarchy, but each site acts as a vehicle for selection, guidance or partial hierarchization. Far from being an amorphous mass, the web links together an open-ended multitude of viewpoints, but this linkage operates transversely, like rootstock, without being subject to any 'supreme vision', without a unifying force from above. Everyone agrees that this gives rise to confusion. New indexing and search tools must be devised, as can be seen from the abundant research currently being carried out on the dynamic mapping of data space, intelligent 'search engines' or co-operative filtering of information. It is highly probable, however, that whatever future progress there may be in navigation techniques, the prolific, open-ended, fundamentally heterogeneous and limitless character of cyberspace will not alter.

There being no semantic or structural boundaries, the web is not fixed in time either. It swells, moves and changes constantly. It is in flux—it ebbs and flows. Its countless sources, its currents and countercurrents, its irresistible growth are striking features of the rising tide of contemporary information. Every store of memory, group, individual or object can become a transmitter and make the wave swell. On that subject, Roy Ascott speaks colourfully of the Second Flood: the flood of information. For better or for worse, those floodwaters will never recede. We must get used to this profusion and disorder. Unless there

is a cultural catastrophe, no major reorganization, no central authority will take us back to the *terra firma* or the unchanging and well marked-out landscapes of pre-flood times.

The historic turning-point in our relationship to knowledge was without doubt the end of the eighteenth century, a time of fragile equilibrium when the Old World shone at its best, even as the fumes of the industrial revolution were beginning to change the colour of the sky. That was the time when Diderot and d'Alembert published their *Dictionnaire raisonné des sciences, des arts et des métiers*—the famous *Encyclopaedia*—the time when a small group of men could still hope to master all knowledge (or at least the main areas of knowledge) and propose to others the ideal of that mastery. Knowledge could still be totalized, summed up. During the nineteenth century, with the expansion of our world, the gradual discovery of its diversity and the ever more rapid growth of scientific and technical knowledge, the idea that one individual or small group could master all knowledge became more and more illusory. Today, it is palpably obvious to everyone that knowledge has forever entered the realm of the untotalizable, the unmasterable. We must let go.

The emergence of cyberspace in no way means that 'all' is at last accessible, but rather that 'all' is definitively out of reach. What can we save from the Flood? What shall we put in the Ark? To think that we could build an Ark to hold 'the essentials' would, in fact, be tantamount to yielding to the illusion of totality. All of us, institutions, communities, human groups and individuals, need to make sense out of the surrounding chaos, to tame it and to mark out areas that are familiar to us. But each person must rebuild partial totalities in his or her own way, according to his or her own criteria of relevance. At the same time, these areas of self-appropriated meaning must perforce be mobile, changing and evolving. So much so that we must replace the image of the great Ark with that of a flotilla of small arks, vessels or craft, a myriad of small, different, open and temporary totalities secreted by active filtering, perpetually refashioned by the intelligent groups and virtual communities that criss-cross and hail each other, clash or mingle with each other on the turbulent waters of the information flood.

The central metaphors of our relationship to knowledge today are, therefore, navigation and surfing, which imply an ability to find our way through waves, eddies, currents and countercurrents over a flat, boundless and ever-changing expanse. By contrast, the old metaphors of *pyramid* ('climbing the knowledge pyramid'), *scale* or (preset) *course* smack of the rigid hierarchies of the past.

In oral societies, discursive messages were always received in the same context in which they had been produced. With the advent of writing, linguistic messages could be detached from the living context in which they originated. People could hold in their hands texts written 10,000 kilometres away or seven centuries earlier. This brought with it ever-increasing problems of interpretation. And so certain types of messages were designed to keep the same meaning regardless of the context (place, time) of reception: these are the 'universal' messages (science, written religions, human rights, etc.). This universality, identity of meaning regardless of context, is built on the idea of meanings that are relatively closed or entrenched. The deployment of a 'totalizing' universality is therefore fundamentally bound up with the practical experience of communication engendered by static writing. Our theory is that cyberculture takes us back to context-related messages, as was

the case in oral societies, but on another scale, in a completely different orbit. Universality is maintained, but it results from general interconnection, and not from fixedness and decontextualization of meaning, this being rendered less necessary by networking. The more cyberspace grows, the more the connections proliferate, the more universal it becomes—and the less totalizable the information world becomes. ‘Universality without totality’ is how we might define nascent cyberculture.

#### COLLECTIVE INTELLIGENCE

Detotalized as it is, knowledge fluctuates. This gives rise to an acute sense of disorientation. Should we hold on to the procedures and arrangements that kept the old order of knowledge in place? Should we not, on the contrary, plunge straight into the new culture, which has specific remedies for the ills that it engenders? True, the interconnection in real time of everyone with everyone else is a cause of disorder. But it is also the condition conducive to solving the problems of guidance and learning in a knowledge universe that is in a state of flux. This interconnection, in fact, fosters processes of collective intelligence in virtual societies so that the individual is no longer defenceless when faced with the information chaos.

In truth, the mobilizing ideal of information technology is no longer artificial intelligence (making a machine as intelligent, if not more intelligent, than a human being) but collective intelligence, which means enhancement, optimal use and synergy of skills, imagination and intellectual energy, whatever their qualitative diversity and wherever they may be found. This ideal of collective intelligence naturally requires the pooling of memory and experience, the exchange of knowledge as everyday practice, and new flexible forms of organization and co-ordination in real time. While the new communication technologies are conducive to the functioning of human groups using collective intelligence, this does not happen automatically. Reluctance to forego exclusive powers, institutional inflexibility and the inertia of mentalities and cultures can obviously cause the new technologies to be put, humanistically speaking, to much less positive social use.

To increase and transform certain human cognitive faculties (memory, imagination, calculation, expert reasoning), information technology partially externalizes these faculties via digital media. Now, once these cognitive processes are externalized and reified, they become shareable and hence reinforce the processes of collective intelligence—that is, if the technologies are put to good use.

Even expert systems (or knowledge-based systems), traditionally placed under the heading ‘artificial intelligence’, should be regarded as techniques for the communication and rapid mobilization of practical know-how in organizations rather than as carbon copies of human experts.

Simulation techniques, in particular those involving interactive imagery, do not replace human reasoning but expand and transform capacities for imagination and thought. Simulation plays a growing role today in scientific research, industrial design, management and learning activities, as well as in recreation and amusement (for instance, in interactive computer games). Being neither theory nor experience, simulation, a means of industrializing the experience of thought, is a special mode of knowledge specific to the nascent

cyberculture. From the point of view which concerns us here, i.e. collective intelligence, simulation makes it possible to visualize and share highly complex virtual spaces and worlds of meaning.

To come back to our first example, the Internet Web pages permit individuals and groups of people to express ideas, wishes and knowledge and to conduct transactions. Behind the great hypertext there is the teeming multitude and its interactions. In cyberspace, knowledge can no longer be considered to be something abstract and transcendental. It is all the more visible—and even tangible in real time—in that it is communicated by actual people. Web pages are not only signed, like paper pages, but often lead to direct, interactive communication through electronic mail and forums or other forms of virtual contact. And so, contrary to all the rhetoric about the so-called ‘coldness’ of cyberspace, interactive digital networks are instrumental in bringing knowledge down to the personal plane and making it more tangible.

The intertwined history of the different kinds of physical media and of our relationship to knowledge could be schematically represented by the interaction and overlapping of four types of ideals:

*First type.* In societies before the advent of writing, practical, mythical and ritualistic knowledge was embodied in the *living community*. When an old man died, a whole library was lost, as Mpate Bâ has so eloquently stated.

*Second type.* With the advent of writing, knowledge was conveyed by the ‘Book’, the unique, indefinitely interpretable, transcendental, supposedly all-inclusive ‘Book’: the Bible, the Koran, sacred texts, the classics, Confucius, Aristotle, etc. Here, it was the *interpreter* who held the reins of knowledge.

*Third type.* From the advent of printing up until the new dawn of the Enlightenment and the *Encyclopaedia*, dominated by the figure of the scholar or *scientist*, knowledge was no longer conveyed by books but by libraries. It was structured by a system of references, and perhaps even then the idea of hypertext loomed large in the background. In that day and age, concepts, abstractions or the system itself were what encapsulated human memory and conferred intellectual mastery, although this was already under threat from the exponential growth in knowledge.

*Fourth type.* The de-territorialization of the library, which is occurring today, is perhaps only a prelude to the emergence of a fourth type of relationship to knowledge. Spiralling backwards, as it were, to the oral culture of a bygone age, knowledge might again be placed in the hands of *living human groups*, rather than being conveyed on various types of material support through interpreters or scientists.

Only this time, unlike the oral culture of old, the direct vector of knowledge would not be the community in flesh and blood and its physical memory, but *cyberspace*, the region of virtual worlds through which communities discover and construct their target areas of knowledge and identify themselves as intelligent groups. Abstract systems and concepts are now giving way to refined mapping of specific features, to the detailed description of anything from large cosmic objects to life phenomena or human behaviour. One need only look at all the major contemporary fields of science—particle physics, astrophysics, the human genome, space, nanotechnology, the monitoring of the environment and climate—to see that they all hinge on cyberspace and its tools. Image databases, interactive simu-

lations and teleconferencing provide a better knowledge of the world than theoretical abstraction, which now takes second place. Or, rather, they define the new standard of knowledge. Furthermore, these tools permit effective co-ordination of producers of knowledge, whereas theories and systems are apt to be either supported or opposed.

The old criteria of objectivity and abstract universality are giving way to temporal and contextual relevance, efficiency, problem-solving capacity and the potential for mutation and bifurcation. But universality is to be found more concretely in connection capacities, respect for standards or formats, compatibility or worldwide interoperability.

Cyberspace, interconnecting the world's computers, is becoming the predominant infrastructure of production, management and business. It will soon constitute the main collective international facility for memory, thought and communication. In sum, in a few decades, cyberspace will be the primary medium for the collective intelligence of humanity.

## **Cybertechnologies and education**

The new information and communication technologies can play a role in educationalists' and decision-makers' reflection and practice in educational policy in at least two ways.

Firstly, as a medium for individual and group cognitive processes, cybertechnologies lead to the emergence of new modes of knowledge and new relationships to knowledge. This implies understanding what the main trends are in the changes taking place in order to keep educational practices abreast of the rapidly changing and increasingly intricate processes of knowledge transfer throughout society today. It is not a question here of using technologies at all cost, but of going along with a change in civilization that calls institutional forms, attitudes and the culture of traditional education systems profoundly into question. It is this line of thought that we have followed in the first part of this article.

Secondly, we can consider the problems and constraints facing education systems (speed of changes in the knowledge to be taught, number of students to cater to, cost, etc.) and see how the use of NICTs can assist in solving the problems and in coming to terms with the constraints. We will now attempt to do so by looking at the problems of education systems and then at the way in which NICTs can be used in helping to solve them by providing support for the development of open and distance learning (ODL). 'Helping to solve' and not 'solving', for it is quite obvious that technology on its own is absolutely powerless without a concomitant change of policy, forms of organization and teaching practices.

### **THE ECONOMIC DIMENSION OF THE TRANSITION TO OPEN AND DISTANCE LEARNING**

It will not be possible to increase the number of teachers in proportion to the ever more diverse and massive demand for education in all countries of the world. The question of the cost of education is particularly acute in poor countries. The only option will therefore be to find solutions involving techniques that will reduce the educational work-load

of teachers and trainers. Audio-visual methods, interactive multimedia, computer-assisted instruction, educational television, cable television, traditional distance education techniques based mainly on writing, tutoring by telephone, fax or the Internet—all these technical possibilities, some of which may be more relevant to the learning content and the 'learner's' situation and needs than others, can be considered and have already been abundantly tried and tested. As regards both physical infrastructure and operating costs, 'virtual' schools and universities are much less expensive than concrete schools and universities providing 'face-to-face' teaching.

From a strictly economic point of view, the transition to open and distance learning, to co-operative learning and hypermedia delivery systems represents a shift in the education industry towards 'modernization' and 'globalization' and, above all, a transition from a labour-intensive industry to a more capital-intensive one.

Traditional face-to-face education may be considered a labour-intensive industry. There is relatively little investment in research and development to improve the quality of teaching and learning. Labour-intensive industries are known to be more rigid than industries based on capital and investment in technology. In this field, as in others, there are striking disparities among countries. In 1988, whereas the developed countries earmarked 70% of their expenditure for teachers' salaries, the developing countries assigned 87%—and Africa 93% (which means that even the simplest educational materials were not available there). Unless a deliberately targeted, internationally co-ordinated policy is put into effect, the massive investment in NICTs by education systems in the countries of the 'North' can only add to these disparities.

Distance education, involving the use of networks and hypermedia, goes hand-in-hand with a general shift of education systems towards rationalization, a greater division of labour and the diversification of provision in response to the variety of changes in demand. While fixed costs tend to be higher (a hypermedia course is much more expensive to prepare than an oral course or one involving a written medium), variable costs are lower. Most studies show that for an equivalent result, ODL generally costs less overall than traditional face-to-face teaching. Economies of scale become possible: the larger the number of students taking the same course, the more profitable the activity, because costs do not rise in proportion to the number of students.

Education is now part and parcel of the dynamics of globalization: more and more universities (especially those offering distance education) aggressively bid for external markets, fight to enrol foreign students, establish franchising agreements for the distribution of their courses, conclude partnerships with foreign institutions, etc. Judicious use of NICTs is clearly a capital asset in this new competitive environment, whose economic, cultural and, in the long run, demographic (brain-drain) implications are obvious.

#### ODL TO MEET THE CHANGING DEMAND FOR EDUCATION

Education systems are today subjected to new requirements in terms of quantity, diversity and, above all, the growing pace of change in knowledge. In purely quantitative terms, the demand for education has never been so great. In many countries today, the majority of an age-group will go on to secondary education. Universities are already overflow-

ing. Vocational and continuing education structures cannot cope with the demand. Figuratively speaking, it may be said that half of society is or would like to be at school.

But, along with this enormous quantitative increase, there is a diversification and growing individualization of educational demand. Education is only part of what people expect of their professional, social or cultural lives, of a lifetime's activity. They are less and less inclined to pursue uniform or rigid courses of study that may not meet their real needs. Responding to the growth in demand by massively increasing educational provision (more of the same thing, aimed at economies of scale) would be an old-fashioned 'industrialist' response, ill adapted to the flexibility and diversity now required.

We can see how the new paradigm of navigation (as opposed to that of the linear course of study), as it has evolved in the methods of information retrieval and co-operative learning available through cyberspace, points the way to both massive and personalized access to knowledge.

Technologies used for education should not be distinguished from digital information and communication technologies commonly used in other sectors of activity. The techniques are the same and are put to similar use. Cyberspace was developed in university circles for research and co-operative learning. It does not need to be specially adapted for education since it was designed from the outset for the transfer of knowledge. It is a response to the emergence of a society of lifelong learning and, at the same time, feeds into that movement. With the development of ODL, more and more pupils and students will be able to learn at their own pace, without being obliged to move physically. Specialists recognize that the distinction between face-to-face education and distance education will be less and less relevant because the use of telecommunication networks and interactive multimedia is gradually being incorporated into more traditional forms of education.

Universities and, increasingly, primary and secondary schools are giving students and pupils the opportunity to dip into the ocean of information and knowledge accessible through the Internet. Education programmes can be followed at a distance through the WWW service of the worldwide network. Electronic mail and conferencing are used for intelligent tutoring and to provide inputs to co-operative learning arrangements. Hypermedia tools (CD-ROM, on-line interactive multimedia data bases) permit rapid and attractive intuitive accessing of vast amounts of information. Simulation systems enable learners to gain a practical grasp of complex objects or phenomena at low cost, without having to involve themselves in dangerous or uncontrollable situations.

Distance learning has long been a mere accessory to education, but, before long, even if it does not become the norm, it will be leading the way. The characteristics of ODL are similar to those of the information society as a whole (network system, speed, personalization, etc.). We may add that this type of education is in synergy with the idea of business corporations as 'learning organizations' that the new generation of managers is seeking to introduce.

The essential point here is the qualitative change that is occurring in learning processes. The aim is less to translate traditional courses into interactive hypermedia formats or to 'abolish distance', than to put into practice new paradigms of knowledge acquisition and formation. The question is therefore not one of doing the same thing with other means, but of using NICTs as a basis for bringing about change concomitantly in the economic

structures, forms of organization and teaching models of education systems. The most promising prospect, one which, in fact, reflects the perspective of collective intelligence in the field of education, is that of co-operative learning.

Some computerized group-learning systems are specifically designed to share various databases and to use teleconferencing and electronic mail. This is known as computer-supported co-operative learning (CSCL). In the new 'virtual campuses', teachers and students pool physical resources and the sum of information available to them. Teachers learn at the same time as students and continuously update both their knowledge of a particular subject and their teaching skills. (In-service teacher training is the most obvious application of the methods used in open and distance learning.)

The latest updated information is becoming easily and directly accessible through on-line databases and the web. Students, wherever they are, can link up to teleconferences in which the best researchers in their discipline take part. That being the case, the teacher's main role can no longer be to 'disseminate knowledge', since that can now be done more effectively by other means, but will shift towards inciting people to learn and to think. Teachers will become facilitators of the collective intelligence of the groups in their charge. Their activity will focus on backstopping and management of learning: encouraging exchanges of knowledge, relational and symbolic mediation, personalized guidance on courses of learning, etc.

It remains for education systems to find the best means of helping students and to adapt their skill-recognition and assessment mechanisms to these new practices.

#### ARGUMENTS IN FAVOUR OF CHANGING SKILL-RECOGNITION SYSTEMS

In addition to the scale and growing diversity of demand, the complexity of the problems to be resolved by educational institutions is further compounded by the speed at which knowledge is emerging, changing and becoming obsolete.

Since the end of the 1960s, human beings have been developing a relationship to knowledge and know-how that was unknown to their ancestors. Before then, the skills acquired in youth were generally still used up to the end of one's working life. Those skills were indeed transmitted practically intact to the younger generation or to apprentices. New processes, new techniques did emerge, but innovations stood out against a backdrop of stability; they were the exception. On the scale of a human lifetime, most useful skills were perennial. The situation has changed radically today, since most of the knowledge acquired at the beginning of one's career will now be obsolete by the end of one's working life, if not before. Economic upheavals and the speed of new developments in science and technology have quickened the pace of social change. Because of this, individuals and groups no longer have before them an enduring set of skills and categories of knowledge bequeathed and confirmed by tradition, but are confronted with a chaotic and largely unpredictable flow of knowledge through which they must now learn to find their way. The close relationship with learning and the transmission and production of knowledge is no longer the sanctuary of an élite, but now concerns the mass of the people in their everyday life and in their work.

The old pattern of learning a trade or profession in one's youth that one goes on



practising for the rest of one's life is therefore outmoded. People are now having to change jobs several times in their careers, and the very notion of 'profession' is becoming more and more questionable. It would be better to think in terms of a variety of *skills*, of which each person possesses a unique collection. It will then be up to people to maintain and enrich their collection of skills throughout their lives. This approach calls into question the classical division between a period of learning and a period of work (since one is learning all the time) and the conception of professions as the main form of individuals' economic and social identification.

Through continuous training, sandwich courses, in-service training schemes, participation in associations, unions, etc., a continuum is being formed between the period of training and the period of professional and social experience. All methods of skills acquisition (including self-instruction) have their place within this continuum.

For a growing proportion of the population, work is no longer the repetitive performance of a prescribed task, but a complex activity in which inventive problem-solving, teamwork and the management of human relations play an important part. The 'transaction' of information and knowledge (production of knowledge, learning, transmission) forms part of any professional activity. Vocational training in firms has now been subsumed into production and work.

Evidently, education must prepare for this new world of work. At the same time, however, the educational or formative character of many economic and social activities must be recognized and this, of course, raises the problem of their official recognition or validation. Existing certification systems are clearly less and less adequate; furthermore, by the time the official seal of approval has been granted for new diplomas and these diploma courses have been set up, the subject-matter may have been superseded by more recent developments.

It may seem commonplace to state that all types of learning and training should lead to a qualification or socially recognized validation. And yet we are a long way short of that target. Many of the learning processes in formal continuing education schemes, not to mention skills acquired by experience in the course of an individual's social and professional activity, do not, at present, lead to any qualification. The nascent relationship to knowledge, which we have just outlined, calls for a re-examination of the existing close association between two functions of education systems: teaching and the recognition of skills.

Now that individuals are learning more and more in non-formal settings, it is for education systems to establish procedures for the recognition of knowledge and skills acquired in social and professional life. To that end, public services relying heavily on multimedia technologies (automated tests, examinations or simulators) and the interactive network (with the possibility of taking examinations or of securing recognition for one's accomplishments with the assistance of on-line counsellors, tutors and examiners) could relieve teachers and traditional educational institutions of the task of testing and validation—a less 'noble' task than helping students to learn, but an equally necessary one. Through this great, open, decentralized service for knowledge and skill recognition and validation, every kind of learning process or scheme, no matter how informal, could be certified by a qualification for the individuals concerned.

Changes in the education system cannot be dissociated from changes in the knowledge recognition system by which it is supported and guided. We are all well aware that examinations are what structure education programmes downstream.

Controlled deregulation of the present skills-recognition system could foster the development of in-service training courses and all forms of training in which professional experience features prominently. By authorizing new forms of validation, such deregulation would also encourage group-led discovery learning and all kinds of initiatives midway between social experimentation and formal training.

Such a development would not fail to provide interesting feedback on certain forms of training of an academic character, often straitjacketed in a style of teaching that does little to encourage initiative and geared only to the ultimate award of a diploma.

#### ODL AND SKILLS MANAGEMENT

There is a close correlation between industrial and commercial performance and skills management policies. Knowledge, know-how and skills are today the main source of wealth of firms, cities and nations. But difficulties are now being encountered in the management of those skills at both the community and regional levels. On the demand side, there is a growing mismatch between available skills and economic demand. On the supply side, many skills are neither recognized nor even identified, especially among those with no formal qualifications. The situation is particularly acute in cases of industrial renewal or underdevelopment affecting whole regions. We will suggest in the conclusion to this article that, alongside diplomas and other formal qualifications, consideration must be given to new methods of knowledge recognition that can lend themselves to an on-network display of skills availability and will help to ensure that supply is actively driven by demand. Communication through the NICTs can be of great assistance here.

Once the principle that all skills acquisition should be explicitly recognized has been established, the problems of skills management, both in business and in local administration, would be at least attenuated, if not actually resolved, for it will then be possible, by applying that principle, to ascertain the situation regarding skills availability in any community, and changes therein. By spelling out more clearly than any diploma what people really know how to do, the supply of and demand for skills can be fairly reflected and thus more closely matched.

It may seem at first sight very far from the role of ODL to provide organizations or communities with instruments for skills management and for matching supply with demand. But is it not the role of trainers or educators to help individuals to align the skills they have to offer with what 'employers' in the broad sense are looking for? Training arrangements (both within firms and in the local and national administration) already play the *de facto* role of intermediary in the supply of and demand for skills. Making this role explicit can only help to bring individuals closer to a job in which they can use all their skills to advantage.

What constitutes proficiency or skill in any field could be determined by negotiation between trainers, individuals and employers, and these skills would be assessed on the basis of the real use made of them in organizations or communities, thus helping to estab-

lish their validity and social relevance. Individuals could then determine which course of learning to pursue according to their position on the knowledge map (point of departure) and what emerged from negotiations within organizations or communities to which they belong as being the most sought-after areas (points of arrival).

### **By way of conclusion: knowledge trees in the service of collective intelligence**

Lifelong and personalized learning by navigating through cyberspace, guiding learners through a fluctuating and limitless universe of knowledge, co-operative learning, collective intelligence within virtual communities, partial deregulation of methods of skills recognition, dynamic management of skills in real time—these social processes reflect our new relationship to knowledge. Michel Authier and I have devised a computerized networking system that ties in with these different processes and uses their combined strength to positive effect. Knowledge trees<sup>1</sup> are a computerized method for the overall management of skills in educational establishments, firms, local government bodies, associations and other employment sources. This procedure is now being tested in various environments in Europe, especially in France in major enterprises like Electricité de France and PSA (Peugeot and Citroën), in medium-sized firms, universities, business schools, local administration (municipalities, Poitou-Charentes regional authority), social housing authorities, etc.

Under this scheme, each member of the community can obtain recognition for his or her diverse skills, even those that are not certified by traditional school and university systems. A knowledge tree, which stems from descriptions that individuals provide of themselves, depicts in an organized fashion the whole array of skills available in a community. By 'skills' we mean both behavioural or life skills and know-how or theoretical knowledge. Each basic skill that individuals possess is accorded recognition on the basis of a strictly specified procedure (testing, appreciation by peers, provision of proof, etc.).

The dynamic map of a group's skills, which can be read on the screen, is not the outcome of any hypothetical classification of fields of knowledge; it is produced automatically and is the expression, evolving in real time, of the learning attainments and experience of the group's members. A community's tree grows and changes shape as the skills of the community itself change.

Very roughly then, basic skills will be in the tree 'trunk', the highly specialized skills acquired at the end of a person's career or training will form the 'leaves', the 'branches' will show the skills that are practically always found together in the course of an individual's life, and so on. But, for example, a skill that is to be found on a leaf at time  $t$  can move down into a branch at time  $t + n$ . The tree, which is different for each community, does not reflect the usual breakdown into disciplines, levels or courses, or institutional divisions. On the contrary, the proposed system of dynamic indexation and navigation produces an open-ended configuration of skills which is constantly being reorganized according to different contexts and applications.

Representation on a knowledge tree makes it possible to identify at a glance the position occupied by a specific area of knowledge at a given time and possible courses of learn-

ing that permit access to one qualification or the other. Each individual has a personal profile (a distinctive combination of skills) represented on the tree, and may consult it at any moment. This gives people a better idea of their position on the 'knowledge map' of the communities to which they belong and they can thus then plan their own learning strategies with all the facts to hand. All the more proof that collective intelligence is a humanistic conception and ultimately an instrument of personal development!

Electronic mail, with an addressing system pointing to areas of knowledge, provides the link between all offers of and demands for skills, and also signposts training and exchange opportunities available for each basic skill. It is therefore an instrument that furthers social bonding through the exchange of knowledge and the use of skills. All transactions and inquiries recorded by the system contribute constantly towards determining the value (contextual in all cases) of basic skills according to various economic, educational and social criteria. This continuing evaluation through actual use is a crucial mechanism of self-regulation.

At the level of local communities, the skills tree system can help to combat exclusion and unemployment by recognizing the skills of those who have no formal qualifications, by making training more relevant to employment, and by encouraging the development of a full-scale 'skills market'. At the level of school and university networks, the system opens the way to decompartmentalized and personalized co-operative teaching. In an organization, knowledge trees provide the tools for identifying and mobilizing skills and for evaluating training courses, and offer a strategic vision of changes in and needs for skills.

As it enables all types of learning activity to lead up to a qualification, the knowledge-tree system makes for better skills management. Conversely, since evidence of qualification is evaluated in real time, the management of skills contributes to the validation of the qualification. Each person who has produced a definition of his or her profile by obtaining a certain amount of evidence of qualification will then be accessible on the network, is indexed on the site and can be contacted for reciprocal exchanges of knowledge or requests regarding skills. Improvement of the qualification process therefore has positive effects on sociability.

Responsive as it is to the speed of changes in knowledge, this instrument makes the rapidly changing pattern of very diverse skills visible in real time. As it enables the diversity of each person's skills to be expressed, it does not lock individuals into one job or category and thus encourages their continuing personal development.

Lastly, let it be repeated that, because they make allowance for all types of skills, including those that are not formally recognized or have been acquired outside the school system, knowledge trees are an instrument for combating exclusion.

Today, every country has a different formal qualification and skill-recognition system. Furthermore, within any one country diplomas and degrees constitute the only—and notoriously inadequate—means of representation of skills common to all branches of industry, all firms and all social milieux. For the rest, the utmost heterogeneity prevails. The knowledge-tree mechanism can reflect other knowledge recognition systems and mutually identifiable evidence of qualification. This evidence may be common to all trees even though it is located and evaluated differently in each one. Individuals keep the same learning programme when switching from one tree to another, but their

profile in each tree is different since it is projected on a different collective 'background'.

The merits of such a system from an international standpoint can be clearly perceived: it is not a question of standardizing or peremptorily regulating formal qualifications since, in each particular community, the same certificates, the same profiles (set of certificates) can have variable positions and values, corresponding to the specific use made of them and the local culture. Yet each person can switch from one group to another, from one country to another and still keep the same list of certificates that defines his or her skills, while this list will automatically have a different configuration and value in each tree.

It is possible to merge, divide and link trees, to combine small trees into big ones, and so on. The open-ended skills map proposed here may be expanded gradually, by extension and connection, without ever imposing hypothetical standards. Like the nascent cyberculture, knowledge trees propose a universal approach (the same mechanism virtually usable everywhere and lending itself to all forms of co-ordination, all imaginable transfers, bridging and routing), but without totalization since the nature, organization and value of knowledge are not fixed and remain under the control of the various communities.

The approach presented here does not require the support of any across-the-board decisions by some central authority. A local project aimed more particularly at combating exclusion and promoting socialization through learning can be carried out in one place, while another project based on new training and qualification schemes can be implemented elsewhere. In another case, there may be an initiative concerned more specifically with the ongoing indexation of training resources. A particular firm or municipality might wish to try out new forms of skills management, etc. But gradual convergence, always based on voluntary participation and the involvement of all parties concerned, is ultimately ensured by the coherence of the proposed system and its relevance to the new configurations of our relationship to knowledge.

## Note

1. Knowledge trees<sup>TM</sup> or skills trees<sup>TM</sup> are registered trade marks of the TriVium<sup>TM</sup> company (10, boulevard de Sébastopol, 75004 Paris; Tel: (33) 1 44 78 64 20, fax: (33) 1 44 78 64 30). They stem from the Gingo<sup>TM</sup> software developed by that company.

## Bibliography

- Authier, M.; Lévy, P. *Les arbres de connaissances* [Knowledge trees]. Preface by Michel Serres. Paris, La Découverte, 1992. 173 p.
- Davies, G.; Tinsley, J.D., eds. *Open and distance learning, critical success factors/Accès à la formation à distance: clés pour un développement durable*. Erlangen, Germany, FIM-Psychology, University of Erlangen, 1995. 203 p. (Proceedings. International Conference, Geneva, 10–12 October 1994.)
- Lévy, P. *L'intelligence collective: pour une anthropologie du cyberspace* [Collective intelligence for an anthropology of cyberspace]. Paris, La Découverte, 1994. 245 p.
- Lourié, S. *Ecole et tiers monde* [Education and the Third World]. Paris, Flammarion, 1993. 126 p.

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# ENHANCED REALITY

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*Goéry Delacôte*

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Any inquiry into the role of the new technologies in the service of education runs up against a severe constraint that, at first sight, makes the task a difficult one: the breathtaking speed at which these technologies are developing, paralleled only by that at which their price, capacity for capacity, is plummeting. The first stumbling-block to be avoided is therefore that of focusing exclusively on today's technological features, while the second is that of soaring off into the realms of pure abstraction. In reality, what is needed is a continuous process of reflection, rooted in an experimental praxis which, in itself, will have a more formative than truly conclusive dimension.

## **Making learning easier**

It is therefore in the light of the limited experience of our practice and research at the Exploratorium that I shall tackle such questions of how technologies are best to be harnessed to facilitate the learning process. What then is the Exploratorium, this place of which and indeed from which I write, described as a museum of science, art and human perception? In point of fact, we are somewhat lacking in suitable metaphors and terms to define this institution. It is not a museum, in the sense that it is not the repository of any natural or man-made objects that possess a curiosity value in themselves (locomotives, insects, etc.). It is rather a laboratory in which devices or mechanisms staging natural and technical phenomena are designed and assembled—in short, a sort of phenomenopolis. By virtue of their design, these devices provide a material and experimental foundation for a learning process through experience, based on the exploration of such phenomena.

The technologies which have served to build them are such that they transform the natural phenomena they present into a subject of spontaneous investigation. They are tools

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*Original language: French*

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A graduate of the *Ecole normale supérieure* (Paris) and Doctor of Science (solid-state physics), this well-known scientist has been concerned with science education since the start of his career. In 1979, he set up the team whose task it was to create the 'Science City' at La Villette (Paris), the science and technology museum which opened in 1986. From 1982 to 1991 he served as Director of the Division of Scientific and Technological Information at the *Centre national de la recherche scientifique* (CNRS), where he set up the INIST Group. Professor of physics at the University of Paris, he is currently Director of the Exploratorium in San Francisco. He is the author of *Savoir apprendre* (1996). E-mail address: goery@exploratorium.edu

of learning or exploration designed by the members of our think-tank after a thorough process of prototyping, which allows both the construction and the pedagogical approach of each of them to be appropriately adjusted. The degree of complexity must be sufficiently high for them to rise above the level of mere didactic illustration, and sufficiently limited to focus attention on the phenomenon presented, and to create an effect of surprise. For example, the model of a three-metre-high tornado materialized through the injection of steam into the air vortex created by a fan makes it possible to study the stability of the vortex.

Visitors' patterns of response are then relatively straightforward. They interact with the experiments or 'manipulations', without any preconceptions and, thanks to the quality of the learning tool's design, very rapidly find themselves confronted by and observing the phenomenon behaving in a manner which they had not anticipated. It is in this gap between observation and expectation that the impetus to probe deeper will find its source. Startled and amazed, visitors then proceed to look tentatively about them, to read the labels and consult the computer (whence the concept of enhanced reality—combining real experience with the use of the computer—by contrast to that of virtual reality), to talk to their neighbours, to ponder aloud, to brood silently. In short, they switch to a quizzical or inquiring state of mind in which they remain plunged throughout their visit to the Exploratorium. The result for them will be a short-term change of attitude informed essentially by the feeling that asking questions is an intriguing and fascinating game, well within their powers. But this will also induce in them a long-term change, in so far as all these powerful experiences with which they have to grapple will leave an abiding trace in their memory, ready to be linked on some later occasion to another experience, or to something they are reading or thinking about, a process that is never more than the beginning of understanding. Or, conversely, the new experience or discovery will be the rallying-point for earlier experiences or thought processes, the culminating moment of an at-last-dawning understanding.

At the Exploratorium, it is the learning process that lies at the heart of the visitor's activity, a process that, thanks to the very ergonomics of exploration, stems from experience. The use of new educational technologies, geared as they all are to the interaction between individual and screen, derives from the same idea, namely from the need to design such interaction so that it leads on to a soundly based, richly rewarding learning experience for the person engaged in it. This being so, how are such technologies to be characterized in terms of the role of medium which they perform in any successful learning process?

An initial dichotomy needs to be highlighted between technologies that give access to databases, and even to knowledge bases (in which the declarative knowledge available in the databases is supplemented by procedural know-how relating to the manner and circumstances in which such data may be used for purposes of problem-solving, decision-taking and task performance), and interpersonal communication technologies. The first category is well illustrated by the example of CD-ROMs and DVDs (digital videodiscs containing an entire film), the second by that of the Internet, its electronic mail and its discussion groups. The Internet also obviously gives access to databases.

## The electronic book

The first category might usefully be termed the electronic book. It involves organizing and storing data so as to facilitate access and handling for purposes of reading, viewing, games, graphic creation and even musical composition, etc. The introduction of texts, fixed images and, above all, sound and animated pictures makes it possible to present information in dynamic formats that are particularly useful for acquiring skills and know-how (DIY, cooking, health, language learning). Many encyclopedias today make use of such multi-media presentations.

However, the real novelty of this new medium lies in its organization. Not only may the new forms taken by the individual items of knowledge be noted; attention must also be paid to their architecture, and to observing the nature of their division into elementary blocks, their organization within the area of knowledge and the hypotheses that can be made on the manner in which they are to be used, on what is termed the user model. The basic idea, whether it be in the case of raw data or of information blocks which have already been processed to some degree, is that storage must be organized in such a way as to facilitate the organization of the process of utilization. In the case of raw data forming part of a database, it is clear that users must be given random access to each data item, according to their needs. For narrative blocks belonging to knowledge bases, this is less self-evident; however, it appears that, here too, random access works better in so far as it is the users who proceed to construct their story by joining end-to-end the blocks they select. The creator of these knowledge bases is then transformed into an organizer whose task it is to design the information blocks, the procedures and the possible ways and means of linking the blocks together in order to create prototype narratives. Authors are in a way dismissed from their function as the constructors of the narrative in so far as there is no longer a single narrative. It is the users who take their place, plotting their own narrative by putting it together, piece by piece, in an act of structural singularity that readers of conventionally constructed books are generally not required to perform.

This feature frequently unsettles young users, who tend to substitute zapping for the development of a personalized reading approach. On the other hand, teachers have ample material with which to invent a new way of teaching narrative construction. The expression 'electronic book' then becomes inappropriate in so far as it contains its own inherent contradiction: an electronic book is no longer a book, not so much because it works electronically but by virtue of the architecture of its content. Users cease to be the readers of a pre-plotted narrative and become rather their own plot writers. If constructing a narrative is obviously feasible when it is possible to call upon a vast array of blocks of knowledge, it is still more feasible—the process is no longer simply one of assemblage, and becomes one of creation in its own right—when communication data or items sometimes created by readers themselves are added to it. As to the narrative, it can be reduced to what happens inside the user's head, a mere mental representation; but it can also be materialized and represented by means of technology, which allows the reader's narrative itinerary to be recorded and reproduced. This last method, whereby a trace remains, makes it possible to evaluate the nature and the quality of the book designed by the reader—which



may, if necessary, be assessed by the author of the knowledge base. An important feature of this approach thus begins to emerge, namely, the possibility of switching in either direction between the author function and the reader function. In the classroom, the designer and the mediator of the learning environment, who are sometimes one and the same person—the teacher—thus become the readers of their students' works after coaching them in methods of narrative plot writing, while the students become the authors of an inquiry, a report, or the organizers of a procedure which they have worked out, by providing an account, via the computer, of their constructions, which they succeed in shaping into a comprehensible story.

## **The electronic network**

The second category of new technologies in the service of education is that relating to their communication capacities, the best-known example being the Internet. In the case of this network, we have entered the era of mass utilization, at least for certain countries such as the United States (by the end of 1996, 11% of households, representing over 10 million users, were connected to the Internet, as compared with 60 million viewers cabled for television), to the point that the fears aroused by its use are focused rather on the phenomenon of network saturation. Such saturation is reflected in prohibitively expensive access times and duration of use. To be sure, access times are limited by whichever of the pipes covering the network's entire circuit happens to have the smallest throughput. When data are being channelled to the user's computer, the limiting segment may be the access ramp, the telephone line and the modem which connects the end-user computer to the network. This situation should change radically when cable television comes to be used as the receiver-transmitter for the Internet. Cable television is still in its very early days as a means of receiving the Internet. For these reasons, many users are in the meantime beginning to become disillusioned when they see these electronic highways being transformed in practice into clogged footpaths, without payment for connection time being suspended for the duration of such traffic hold-ups. As a result, a number of major universities, backed up in the recent election period by the President of the United States, have announced their intention of building an exclusive, higher throughput network, which they have baptized Internet II.

For education there are many advantages to be derived from using these networks for communication purposes, just as there are many risks entailed.

The first obvious fact is the multiplication of lines of access to information sources. Much has already been written about this profusion of available information. Let us highlight a few key issues relating to search tools. Powerful search engines are available today which make it possible to locate the use of a word or of several words linked together by Boolean operators (the operator 'and' in particular) in all the information bits which contain them and are posted on the Internet. For example, a word such as 'biology' can give access to thousands of references. The search engines are constantly scanning the content of sites, and thereby predigest and regularly update search operations. This is what makes engine-assisted interrogation so rapid and effective. The difficulty then is to identify in this pile-up of information those items that will correspond to the user's search tar-

gets. With what other keyword should it be matched in order to narrow down the search? How is it possible to judge the likely quality of what will be found through the selection of key words? Is it best to take rapid stock of the content of the data identified by the search, an operation which is possible for a few dozen but certainly not for hundreds or indeed thousands of such data items? Experience, in fact, shows that, faced with the explosion in the number of sites and in the content of each site, it is all too easy to be carried away by search operations that turn out to be extraordinarily disappointing. Obviously, such disappointments are sometimes offset by the good fortune of making an unexpected discovery in the course of a visual display. But this is certainly a game of chance in which the hope of striking lucky may prove astonishingly small.

The second method of facilitating search operations is to become familiar, with or without the benefit of a search engine, with a number of sites the quality and nature of whose material are discovered independently, or else by hearsay or by consulting the relevant literature. Already, labels of quality are being awarded in profusion, with particular sites emerging as front runners; lists of the ten best sites on a given subject are in fact regularly published (the Exploratorium site is considered to be one of the ten best sites for education in the United States). Peer assessment may help considerably in reducing search and retrieval times. In the same vein, the practice of intermeshing sites through the use of 'html' language is developing, thereby facilitating hypertext linkages. For example, a site can propose a range of preferred sites for the month, if necessary compiling the list of previous preferences as these varied from month to month, and give access to them simply by clicking the mouse.

Internet users thereby build up a directory of sites which they trust alike for their relevance, their quality and the frequency with which they are updated; a site is visited frequently only if it is regularly updated, so true it is that the craze for novelty is what inspires a large proportion of users. Starting out from the small number of familiar sites that are recognized and appreciated by them, users proceed beyond this first circle to seek sites located on the second and third circles designated by those which they already know. A certain amount of overlap and duplication must be expected; however, the guarantee of quality as tried and tested by third parties in whom one already has confidence will be of great assistance. In practice, it is the combination of these methods and many others currently being developed (recourse to intelligent search agents the design of which is today the subject of various research projects) which will facilitate access to the relevant information. This is patently a field in which innovation in search procedures and algorithmic routines will continue to flourish for a long time to come. The National Science Foundation is taking an active interest in this field by funding contracts on the subject.

Once the information has been identified, it is, of course, necessary to take note of it, and if appropriate to locate or mark it with a bookmark, to load or even download it electronically and to print it in order to incorporate the material into compositions or reports being prepared by the user, where it will feature alongside other data. This ability to extract the correct or relevant information and to put it together with other data is crucial in the case of education. It is also a current practice. To be sure, the passband or the storage capacity may impose constraints or limits in regard to access or loading time in the case of fixed images and even more so in the case of video items.

This aspect of the new communication technologies, attractive and sometimes risky though it may be (the risk is that of getting bogged down or lost, or of stumbling upon inappropriate and even dangerous information), is probably not the most innovative. For what is basically involved here is the extension of the library function, an extension which will incidentally oblige libraries to reorganize their collections and the nature of the access afforded to them in order to put themselves within reach of their readers. For educational purposes, model lessons, entire curricula, examples of scanning, interrogation and cross-checking, cognitively successful dialogues, etc. will be found in this context: in short, a sort of educational video library that books do not provide. Such educational data may also be found stored on CD-ROM or DVD, as referred to earlier. But these will always remain in essence libraries. The truly novel and most interesting feature will result from the mixed access afforded to this type of document, involving opportunities for communication between different points on the network. And the greater the need felt for the one (access to databases), the happier the user will be to be able to resort to the other (conversation on the Internet) in order to facilitate both data retrieval and the process of building meaning into the data.

The process might begin with dialogues between the user and teacher or student models that take account in their design of recent research in the field of human cognition. To be sure, this is no substitute for dialogue between real people, but it is already more rewarding than mere access to databases.

It is known how useful in educational practice reciprocal teaching may prove to be as a pervasive framework for internalizing cognitive learning strategies and strategies for problem-solving and decision-taking. For example, teachers clarify orally their interpretation of a text by enunciating its meaning at every stage, and by anticipating, in the light of what has just been read, what will be found in the text remaining to be read. They do so in the presence of the pupils, who know that they will be called upon shortly to do likewise, if such are the rules of the game. This represents an example of the exteriorization of expert cognitive practices which pupils can little by little assimilate through a process of apprenticeship to the teacher. Ultimately, the pupils learn to internalize them, and to perform or apply them virtually in the form of routines on their own behalf. Such classroom recourse to cognitive apprenticeship, which requires the presence of expert teachers with wide experience of such exercises, can also be practised via the network, when no trained and willing teacher is available on the spot. However, the process can conceivably be taken a stage further, namely by placing teacher or pupil models on the network. Students interacting with these models will discover that these models, for example, incorporate errors that have been deliberately built into them but are not indicated; for instance, they may demonstrate orally how a problem is solved but use an incorrect approach or an unduly laborious strategy. The network thereby facilitates interaction, not between two individuals but between an individual and a model, a process that is far more open-ended than recourse to artificial intelligence, but less flexible than recourse to a real expert.

To be sure, direct recourse to interpersonal audio and visual communication as well as through multipoint connections via the network is bound to become widespread. Current audio-conferencing capacities have already expanded to video-conferencing, and can be

used either on-line or off-line (off-line use is less restrictive than on-line conferencing, but less spontaneous, being another type of exchange altogether).

Experience is already today demonstrating the potential role of this form of communication for education. For both pupils and classes, it is first and foremost an unexpected means of consolidating the class group. Remote communication with another group does, in fact, require that the group be presented as such, and thus in a way prompts it to forge its own identity. This, in turn, calls for a major effort of presentation (with the emphasis on simplifying and shortening the message, to ensure that it is cogent and to the point) on the part of each of the individuals composing or speaking for the group. The group is thereby led to communicate with itself a great deal in order to be able to communicate a little with the outside world. To date, this is undoubtedly one of the major benefits of distance communication experiments conducted between classes.

The other dimension also inherent in this form of communication is the opportunity which it affords to students to express themselves and to produce work for publication on the network, using it to present the results of their investigations, to transmit their comments, to formulate their questions and to display their creative abilities by means of drawing, images and video sequences. This obviously constitutes a very strong incentive to undertake the individual and group work that must precede the formatting of what is to be communicated. It involves considerably more than the formulation of an electronic message. It is, in fact, a very potent source of motivation for today's students. The powerful and highly contemporary lever which drives people to learn in order to be able to communicate, and to communicate in order to be able to exist, is here operating at full strength. It is the token of a new reason for learning in this world of ours, so dominated and sometimes alienated by the media. One of the handicaps which continues to plague the development of such publications by users on the Internet is the difficulty of working out a satisfactory copyright policy with publishers. In particular, the concept of 'fair use' for educational purposes must be defined in an open-ended manner. Fair use must allow students to incorporate documents for on-site display on a non-profit-making basis and without limitation of duration. Discussions are currently under way in the United States on this issue.

## **The example of the Exploratorium's web site**

Let us provide a few insights into the sort of material capable of being originated and posted on the Internet which can stimulate the young to learn about science.

It is, for example, possible to refer to topical events and to initiate the presentation of a place to be explored, thereby encouraging teachers to organize visits in the company of their class. Thus, a recent occurrence of oil pollution in San Francisco Bay prompted us to post information (texts, images and sound) on the existence of a physical model of the Bay built by Army engineers in order to study currents, evaporation, the impact of dykes and dams, the concentration of drinking water in the Bay area, etc. The model is housed in a building with sides measuring over 200 metres in length which can be displayed and visited on-screen thanks to the network. A recorded interview may be heard with one of the rangers working there, who explains the origin and usefulness of this phys-

ical model. This provides an opportunity to present a topical scientific event in a context applied to the environment and its protection (how to prevent the spread of and eliminate an oil slick, and how to conserve drinking-water).

Interactive practical work—manipulations—can also be undertaken on our site. Not all the 700 manipulations developed at the Exploratorium can be screened in full (manipulating a tornado remains more interesting than manipulating the image of a tornado!), but several of the experiments are excellent candidates for such transfer to the screen. It is enough for these experiments to be based on visual material and to involve human perception for example, such as the illusion of the rotation of a trapezoidal window which is perceived as an oscillation rather than as a rotation. Better still, the new technology makes it possible to download from the network a programme for manipulating the window (Quick Time VR) which, once downloaded, enables it to be manipulated on the screen at will. The on-screen manipulation thus becomes even more interactive than in the physical space of the Exploratorium, where the window rotates automatically. The observation of an 'afterimage' which appears in the complementary colour of an object being observed is another instance of what can be explored via the network. (For example, the observer watches a green bird for a number of minutes; when the gaze is then turned to a white background, the image of the bird is seen outlined briefly in the colour complementary to green.) All these manipulations, adapted for the screen and accessible via the network, can be made available to students virtually on a self-service basis.

In addition to manipulations and visits to exhibitions (Quick Time VR makes it possible to move about within the exhibition by scrolling the images of the exhibition area as if one were looking around it), there is a range of scientific activities designed for the students but which cannot be undertaken in their entirety on the screen, such as the dissection of a bull's eye. The interest of this activity is that it enables the user to locate on the screen all the practical and technical data (textual, audio and visual) needed to carry out the dissection (where to procure the bull's eye, what scalpel to use, how to operate) together with a filmed demonstration as the culminating point. Its potential interest is even greater, offering different pedagogical approaches to the manner in which the demonstration of the dissection of the bull's eye is presented. The case for each of these approaches is argued, with supporting demonstrations and explanations, by different presenters who are members of the museum's teams. We may imagine how enriching such information will be for teachers required to prepare a lesson or practical work on a particular topic or concept when they are one day able to locate on the Internet this type of technical, practical and educational data, enabling them to choose between different pedagogical approaches in accordance with their personal preferences or by reference to the nature and level of their students. It will also, it may be hoped, be possible to record and represent the performance of particularly talented teachers who have acquired lengthy experience in a specific field, and to question them on their reasons for proceeding in the way they do. More generally, this will enable a data-base composed of significant pedagogical experiments to be assembled, which could serve as possible sources of inspiration or even models. One thing indeed that the education system is at present not very good at doing is to capitalize on the experience of its teachers and experts and disseminate that experience efficiently, not to mention the fact that, in all previously mentioned respects, it is pos-

sible to use electronic mail in order to formulate comments and to turn one's own stock of experience to account as a user or citizen in order to enrich scientific debate, or the particular exhibition, manipulation or activity involved.

By means of such feedback, used for certain exhibitions posted on the network, we were thus able to imagine a new approach, which we dubbed the 'co-designed exhibition'. A 'co-designed' exhibition is one based on the initial contribution of our teams together with the contributions of our users or visitors, a number of which may become part of the exhibition itself. This calls for an initial design format that invites contributions from users, and subsequently lends itself to the necessary work of filtering, selection and reformatting of these outside contributions. The result may be splendid for, here too, the boundary between designers on the one hand and users on the other is partially abolished. The three concepts—the enhanced reality generated by the network, co-designing, and frequent updating—are key characteristic features of the exhibitions planned for the future. This trend will be greatly facilitated by recourse to these communication technologies because of their new characteristics. It is also possible to use the network to operate techniques for remote (visual) data capture. For example, sampling of static-shot film-camera images transmitted at one second or one minute intervals allows the posting and storage of observation data on a remote environment (where the camera networked to the computer is located). The observation of animal behaviour in nature or in a zoological garden, water currents, cloud movements, traffic flows, etc., are all excellent examples of subjects for observation which can lead on to possible investigations.

Finally, the network can be used to take part in rather more elaborate or sophisticated interactive experiments. For example, it is possible to connect an aeroplane carrying a party of students, teachers and their equipment with the ground by means of an Internet link. Classes on the ground can thereby take part in experiments undertaken during the flight, and even pilot them. This type of real-time experiment can be transmitted on-line or off-line on the network by the *webcast* technique (a term extrapolated from the concept of *broadcast*). All network users can thereby hook into such experimental communication between sky and land if they are equipped with software permitting audio communication, which they will find on the network.

In all these cases, the teacher's role is patently quite different from that of the conventional teacher. Teachers are far more organizers of experiments, brokers acting as intermediaries, conductors or even orchestrators of their students' individual and collective learning processes and evaluators of results. This is rather different from the traditional function of teachers, who present information, propose and correct exercises, and report on and supervise student performance. The teacher's job is thus becoming somewhat more complex, but also far more fascinating. It is to be hoped that, if this transformation of the profession does occur, it will serve to draw more people to it as a vocation.

## Conclusion

In conclusion, it must be recognized that we are today living in an era of lightning development in information and communication technologies. Using them for education is not an automatic guarantee of an improvement in the learning process. Ineffective practices,

focused on the teacher as the centre of action, may easily be maintained and even amplified by means of these technologies. It is therefore vital to think about their proper use, by adopting a pedagogical approach which predicates that use of the help provided to the individual learner, which takes account of what we know today about human cognition in the field of practical or applied learning, and which leads to a rethinking of the teacher's role as more that of a designer of the learning environment, a knowledge-broker, an expert in matters of cognition and an evaluator engaged in team work. It then becomes possible to envisage that new uses of these media will be devised by adopting a pragmatic and experimental approach that is guided by the concern to identify what are the truly novel features of such technologies. Based on an extrapolation of what are today offered by books and the telephone, such technologies do in fact considerably broaden the range of their contribution thanks to their multimedia dimension, the ease with which they can be regularly updated, the abolition of the boundary between designer and user, and the possibility of involving two or more people in the design process, thereby enabling learning to acquire its full social dimension. It would be a pity if we failed to take advantage of such an attractive potential.

### **Bibliography**

Delacôte, G. *Savoir apprendre* [Knowing how to learn]. Paris, Odile Jacob, 1996.

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# CAN NETWORKS HELP TO MODERNIZE SCHOOLING? THE TOLIMA RURAL RESEARCH NETWORK (COLOMBIA)

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*Miryam L. Ochoa and Betty Monroy Henao*

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## Introduction

One of the commonest topics of discussion in education concerns the persistent inability of education in general and of schools in particular to keep pace with the advances in information technologies and development. Recognizing this, the Foundation for Higher Education (FES) brought together a group of researchers in order to discuss and analyse, under the general guidance of Rodrigo Parra and Francisco Cajiao, various innovative experiments with a view to identifying ways of bringing schools up to date.

In this article we present first a summary of the distinguishing features of the various types of network we have been able to identify, and then a brief historical outline of

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*Original language: Spanish*

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the network of rural teachers engaged in research (REDIR). We conclude by identifying some features that could help to modernize education.

## Types of network

As regards the question of networks, for a start we identified twenty-four different ones relating to education. Although all share many basic features, three major types emerged from an initial examination.

We have termed the first category *academic*, because they were formed and organized with a view to comparing, validating and socializing knowledge, and to establishing academic groupings. As Clemente Forero puts it (1995, p. 603), they are 'invisible colleges' reflecting a community of themes and interests. Generally speaking, this type of network operates in the context of projects and in groups, and enjoys some institutional support. Furthermore, they are not just local or national, but international in their coverage. The most recent additions to this category, it should be noted, are motivated by an interest in vocational qualifications.

Those in the second category we have termed *romantic*, since their basic purpose is to exchange views and information in a friendly manner, and not to validate or compare knowledge. This type of network operates in a spirit of friendship and comradeship, and can involve collaboration on certain subjects or studies, but not necessarily work on projects, although a thematic affinity may also come to light. These networks are more local and provincial in scope, although they are intended to operate at the national level. Unlike the other two categories, they are organized more on the initiative of their members, though they are not registered as belonging to educational organizations (school, university or teachers' unions). Their most notable feature is perhaps that their members do not wish to form an academic grouping; that is, they do not wish to place their association on a formal footing.

The third category comes closest to the popular concept of the network, and we have called it the *service* network, because its functions involve the identification, gathering and dissemination of various kinds of information. In other words, they are documentary databases on specific subjects which are accessible to individuals and institutions. Such networks are identified by the type of information they offer and they may have a wide range of users. They also have resources behind them, in addition to multi-institutional and international support, and may offer their information on a paying basis.

As may be observed, the common denominator of the three types is the fact that they are providers of information and, ultimately, of knowledge. As will be demonstrated by the story of REDIR's development, and the overall outcome of the research effort we describe later, the key element is not information technology—new or otherwise—but the principle of co-operation that permits open and frank communication between individuals and the free expression and exchange of ideas.

## **The network of rural teachers engaged in research—REDIR**

The network came into being about two years ago, on the initiative of the group involved in the programme 'Long live our school!' and as part of the back-up activities for rural school education organized by the Committee of Coffee Growers in the Tolima Department.

This programme has supported school building, a newsletter entitled *Pilas maestro*, a series of activities to promote and make known the rural education system, recognition of the importance of rural teachers, training and sessions given over to discussion of education.

The Committee of Coffee Growers has always provided support for rural communities and a programme was introduced to support primary basic education in the rural sector, with emphasis on the coffee-growing municipalities. This gave rise to the 'Long live our school' Programme with its three all-important strategies: the training, further training and support of teachers. They need support in the form of workshops, newsletters and newspapers.<sup>1</sup>

The education discussion groups are attracting an increasing number of teachers. While the first few issues of the newsletter contained general information on the practicalities of teaching and were prepared by the professionals of 'Prohaciendo', the teachers themselves gradually began to send in brief notes on their experiences and concerns. Subsequently, in 1994, with the support of the Committee of Coffee Growers and assistance from the Departmental Secretariat of Education, the departmental Rural Teaching Prize was introduced as an incentive for innovative teachers, encouraging them at the same time to write about their experiences. The little newsletter soon became a regular journal, and issue no. 41 published the first prize-winning entries from teachers.

Although the promotion and support of the departmental Committee of Coffee Growers have been crucial, the funding for this type of programme subsequently diminished owing to fluctuations in the price of coffee. The teachers of REDIR have therefore repeatedly asked that a body should be established and consolidated that went beyond the 'Long live our school' Programme and gave them more to say in the organization of activities.

Norma Yaneth Buenaventura became the focal point of these concerns of rural teachers and, after analysing the context and the close links between them that had formed in the training workshops, came forward at a 1995 research training meeting in Líbano (El Tolima department) with the idea of forming a network.

## **Why a network rather than an association?**

The idea of a teachers' club or an association or an educational community was discarded from the outset. Some expressed their views, others put forward visions, and finally meaning and form were given to this proposal that was initially a response to an obstacle, and which subsequently became a threat to their survival as a group, a team, a community united by the remoteness of the rural world.

The network idea that was put forward on this basis could be described as romantic and academic, much closer to the social, traditional network than to computer and cybernetic networks. In REDIR there are shared objectives, a community of interests, interrelationships, periodical meetings and no small measure of affection and romanticism in the members of this community united by their remoteness from the outside world.

What we have is a union; the network is something in which we, as rural teachers, feel supported. It takes us out of our everyday world and enables us to get to know people in other areas and exchange views with them, so that solutions that have been found here may be of use to our colleagues, to pupils elsewhere.<sup>2</sup>

While the opportunities provided by the Committee of Coffee Growers and the initiative of the departmental Rural Teaching Prize were important factors in the forming of REDIR, the key elements now are Norma Yaneth Buenaventura herself, the thirty rural teachers who took up the idea in the first place, and the plans they have for their lives and, of course, their pupils. Interviews and talks revealed that these people are all individuals with inquiring minds, teachers by vocation and conviction, who have turned their teaching work into an adventure full of difficulties, challenges, obstacles—but also satisfaction.

In addition to loving it, we are seeing that our profession has sides to it that we had not explored and that one has to go in and explore them, that it offers all kinds of opportunities to play our part [. . .]. I had it [education] in my blood. The La Albania district is where I realized that I really was a teacher.<sup>3</sup>

I applied for a distant posting, the remotest municipality in the El Tolima department, because I wanted to serve people in need.<sup>4</sup>

None of the fifty teachers belonging to REDIR, nor Norma Yaneth herself, thinks in terms of any other activity than rural teaching; they think and demonstrate through their activities that they are different, that they are going to make a difference to their schools, to their pupils, to their communities, and they hope to be able to encourage other teachers to have a closer understanding of their pupils, to improve their teaching and possibly to join the network. They consider a network as an opportunity to support one another, learn from one another, share the results of their efforts and their research in the classroom, and identify aspects that need improving and resources that can be used to do this.

It is a network that helps you to know what is going on elsewhere. Everyone has something to contribute, news of their neighbourhood, real-life experience, anecdotes. It really helps you, particularly as regards making contact with other people.<sup>5</sup>

REDIR offers an opportunity for teachers to back one another up, to share views and to reaffirm their concern for the quality of education and their responsibility as trainers. They joined REDIR as a result of their participation in educational discussion groups and forums, and because the contributions of their colleagues and pupils in the region, published quarterly in the review *Pilas maestro*, address their concern to make the school and educa-

tion something different from what they had had to endure when they were pupils in basic education and students at a teacher-training college or university. The radio broadcasts of the 'Long live our school' Programme told them what could be achieved, that changes, not to say innovations, could be introduced despite the opposition of colleagues and the lack of resources for rural schools. Their bold approach to education enables their pupils and those of the other teachers in the network to enjoy being at school and brings everybody constantly closer together.

The magazine reports work done by the teacher, and the articles are written by teachers and pupils, in very plain language. It is about culture, environmental education, sex education, and communication. There is no subject that cannot be raised.<sup>6</sup>

### **Why must REDIR be open to everything and everyone?**

Although the idea initially was that the network's members would be teachers competing for the departmental Rural Education Prize and no-one else, the letters, calls and visits by many other teachers, and also pupils, to the 'Long live our school' Programme made the original members realize that if they wanted the network to have some influence, to expand and to endure, they had to keep the door open to all and not just those who could write. The main thing was to share, to make contact, to communicate, to belong.

REDIR is open to all, but its core membership of teachers/administrators promote activities, plan meetings, identify needs for training and further training, conduct research, systematize their experience and publish the results. With its journal and radio programmes, it reaches over 1,800 schools. There has been a gradual increase in the number of teachers attending meetings and forums, taking part in training activities and seeking to share their experience by writing about them, as well as learning from others.

Reading the countless pages of transcripts and listening again to the tapes of interviews makes it clear that REDIR has become a channel of communication and interaction between teachers who want to do more than work their way through the Ministry of Education's syllabuses. They are not clock-watchers and are not forever complaining about limited resources or clinging to the traditional structures and hierarchies of yesterday's schools. They have become used to overcoming obstacles, continuing to teach under difficult conditions and being branded as trouble-makers or called 'crazy' since they set out to make friends with their pupils and help them to be creative, to learn how to learn, to have some hope of improving their situation and giving them the will to do it.

This network is not just a few crazy people, people with what some see as quite absurd ideas. These ideas attract attention, interest people, and make a lot of things clearer. You can be sure that behind all the educational innovation and all the networks, wherever anything new is being done in schools, there is a bunch of these crazy people.<sup>7</sup>

One of the most interesting things about REDIR is the gradual build-up of participation of pupils taught by teachers belonging to REDIR or who read the magazine *Pilas maestro*.

What started out as an exercise to promote the review, the experiments and the network, and to encourage the voluntary participation of other teachers, exceeded all the expectations of the 'crazy ones'. Other teachers began to take an interest, but those who were most interested in the idea were the pupils.

Today, there is a section in the journal for children and young people, with stories, letters, games and puzzles prepared by the pupils themselves. The quarterly publication of the journal is a cause for celebration and another opportunity to share ideas, to feel part of a group and to participate in its dreams for the future. As Edda Isabel García says, 'the work of the youngsters is even more important than our own because they show what kind of work we ourselves have done'.

The teachers and Norma Yaneth are aware that the assistance of the Committee of Coffee Growers should not become paramount. At present, 'Prohaciendo' distributes over 1,800 copies of the journal free of charge to the schools of the Tolima department. This means that most of the teachers in the network have decided to subscribe and are ready to encourage new subscriptions. If the economic situation so dictates, it may be necessary to economize on the present format, but these teachers are not prepared to stop sharing ideas and experience, because that is the very essence of REDIR. 'If the magazine were to go under soon, which I do not think will happen, we would not let it close down. We would manage somehow, if only with leaflets,' states Edda Isabel García.

## **A sense of belonging**

The distinguishing feature of the Colombian education system is that it encourages teachers to feel isolated, to cut themselves off from their environment. It is just this lack of contact, of publications to which all those involved in training processes can contribute, that has, by comparison, made the members of REDIR feel so united. When they are given the chance of communicating, sharing, interacting, learning and forming an educational community, where there are neither checks nor sanctions, teachers and pupils take full advantage of it.

REDIR has provided this opportunity for interaction, for joint activities, for sharing and learning from one another and, above all, for not feeling alone and cut off from progress in one's subject or from new ideas that other colleagues or teachers are trying to introduce. These 'crazy' teachers who are devoting their lives to education and who want to be better teachers have seized upon the network and want to learn to bring research into the classroom. They want to inspire their pupils, their colleagues, their communities and the education system, giving it more relevance and bringing it closer to the realities of the rural world. Victor Manuel Gómez, a teacher at the 'El Totumo' Education Centre, said that: 'Education has to be a tool in one's design for life. It has to be a guide for living or for inventing one's life'. Edda Isabel García added: 'I think we want to do something different in education; we want education to get through to children and be something that changes their lives.'

With the support of the 'Long live our school' Programme, the teachers meet twice a year, to determine in a participatory and democratic manner the focus of their training activities, to inform each other about the progress they have made, to debate and clarify their doubts, and to be informed about national events. In a friendly and comradely atmos-

phere, where that remoteness so characteristic of the rural world in Colombia dwindles down to nothing, the REDIR teachers also look into the possibility of organizing more workshops, symposia or forums, or visiting the schools of other teachers to learn from their experience. If they cannot afford to travel, they also arrange for at least some of them to make trips and then to pass on their experiences about what they learned and what battles they have fought.

These meetings have given rise to joint projects reproducing successful innovations that are, above all, adapted to the rural setting. This applies, for instance, to the mango processing programme carried out with parents and teachers of the La Albania Education Centre under the leadership of James Galvis, or the El Totumo classroom creativity programme of Victor Manuel Gómez, or Edda Isabel García's programme of folk tales as a means of rescuing the local narrative tradition in the Chicoral district.

### **Who owns the network?**

REDIR belongs to the teachers, for it is they who have given it life, are shaping it and are attempting to consolidate it. They have decided that they must keep it alive because it is important for their personal and professional fulfilment. REDIR has made them realize that they are teachers, that it is possible to enjoy teaching, and that their new approaches generate change and can be applied in other communities. They have also realized that their dreams and ideals for education and the community can be shared, and that there are other people willing to work towards the same goal and turn the school into a development centre for the community and its inhabitants.

I try to see that everyone takes part, that the school is not just teacher and pupils and no more. I like the community to participate. I like all community guidelines to mention the school. I like everyone to be involved in the school's work. This is something good that they say has never happened before.<sup>8</sup>

REDIR supports teachers, whether or not they are active members. With the journal, the meetings, the radio programmes, the publications of the Committee of Coffee Growers and the informal publicity given to it by REDIR members in the course of their travels, in their social activities and in their day-to-day contacts, links have developed that go beyond educational work.

Unlike other networks, while REDIR has become more serious, more of an intellectual community and more mature, it has lost nothing of its idealism. It remains to be seen whether in the future, unlike so many innovations introduced in education, REDIR is capable of maintaining its identity, flexibility and receptiveness as it becomes integrated into the school system. It should refuse to be contaminated by the formalism and rigidity of approaches that cut the school system off from reality and change.

### **Conclusions**

Networks offer a type of social interaction in which the participants have explicit (or implicit) assumptions that confer meaning on their action. According to Grice (in Edwards

& Mercer, 1990, p. 57), interactions in teams are based on the *principle of co-operation*, which is defined as a rule that everyone expects the others to follow: 'Make your contribution as necessary, at the appropriate time, following the accepted purpose or direction of the exchange in which you are taking part'. Shared knowledge is a question of language and of a great variety of shared experiences and of suppositions, perceptions and insights.

The sharing of knowledge is an activity which shapes the entire social life of a human being. Work in networks is an example of that activity in that a constant effort is made to communicate information to others. Shared knowledge is accumulated through joint activity and interchange that is converted into a common approach and a contextual basis for all subsequent communication.

Networks also promote cognitive, emotional and cultural socialization, to the extent that knowledge is created and shared without centralization and control by a handful of people.

The process of socialization involves two basic cultural concepts: identification and identity. Identification helps us to be part of an environment whose comprehension, appropriation and transformation are achieved by means of more or less conflictual processes; and identity helps us to be individual subjects (in terms of history, cognition, politics, production and values). We human beings organize things and events on our own terms, which means in our own cultural terms, and, to this extent, we organize our perception of the world partly in terms of a culture. The combination of experience and knowledge of the world entails permanently rethinking the world and putting different pieces of information alongside each other in order to make them meaningful.

Identity is a multiple process since it involves the relationship with oneself as an individual, with one's ethnic group, with one's nation, with one's colleagues, and with the whole human race, in a dual, apparently self-contradictory action. When, in order to define themselves and the way in which they are 'different', communities identify with their natural and social surroundings, with their culture and their history, they set themselves apart from their neighbours, from other ways of being and existing, from other ethnic groups and from other cultures that are equally entitled to be different.

This social process produces an awareness of one's own difference and recognition of pluralism in a dual operation making for both differentiation and integration. Seen in this context, networks can be said to strengthen identities, consolidate autonomy and reduce the scope for imposition on or oppression of others. An understanding of who we are is a bulwark against tyranny.

The handling of information broadens the cultural and social framework with which individuals and groups identify. The ultimate goal of a social network is to make possible communication and understanding between communities and individuals that are different and distanced from one another for a variety of reasons.

The network is a traditional form of co-operation and communication between human beings, and its scope is now being extended by means of the computer. The essence of a network, however, is the social and cultural presence of the persons and groups that enhance and sustain it. Networks are distinctive social entities that acknowledge and appreciate differences and have a stake in different worlds. Networks transcend geography and

can generate immense chains of transcultural friendships and social alliances that develop into democratic forms of exercising civil power.

The labyrinthine multiformity of the knowledge, actions and emotions of a complex individual who shares an image structure with us and a diverse world with all other creatures, in which our own knowledge and evolution tie in with those of others in a variegated network of dynamic interactions (Dabas & Najmanovich, 1995, p. 13).

And this is just what the essence of schooling, with all its participants, should be. With their co-operative, interactive approach, networks overcome the barriers of geographical distance and offer access to information and opportunities for social linkages across a broad spectrum. They can and should thus become overarching metaphors for educational activity.

### Notes

1. Norma Yaneth Buenaventura, Director of the 'Long live our school' Programme organized by the Committee of Coffee Growers of the El Tolima Department.
2. Marlene Sierra, teacher in charge of the Education Centre, La Albania district.
3. James Galvis, technical and agricultural teacher at the Education Centre, La Albania district.
4. Natividad Lozano de Vargas, teacher at the 'Luis Carlos Galán Sarmiento' education centre in the Veracruz district, Alvarado municipality.
5. Marlene Sierra.
6. Edda Isabel García, teacher at 'San Luis Gonzaga' College, Chicoral municipality.
7. Norma Yaneth Buenaventura.
8. Marlene Sierra.

### References

- Dabas, E.; Najmanovich, D., eds. 1995. *Redes: el lenguaje de los vínculos* [Networks: the language of links]. Buenos Aires, Paidós SAICF.
- Edwards, D.; Mercer, N. 1990. *Common knowledge: the development of understanding in the classroom*. London, Routledge.
- Forero, C.; López, A. 1995. La racionalidad de las redes de investigación [The rationality of research networks]. In: *Colección documentos de la misión*. Tomo VII. Fuentes Complementarias III-Creatividad, Formación e Investigación. Bogotá, Presidencia de la República/Colciencias.



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# NETWORKING AND THE USE OF INFORMATION TECHNOLOGIES IN THE FRENCH EDUCATION SYSTEM

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*François Louis*

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Although it is not easy to form an overall picture of the concept of 'networking' as applied to the education system, it is nevertheless possible to highlight a number of key ideas relating to it.<sup>1</sup> Firstly, how can it be defined? The dictionaries emphasize two keywords denoting linking and interconnection. The first of these keywords is *to link*, but in this context it is not a question of linking in a haphazard fashion, with no central guiding thread. A second keyword is *together*, which suggests the idea of organization: a network consists of links which are not random but are organized into a pattern. In fact, the idea of the network is an essential concept even in the earliest stages of the organization of matter or life: even the first units—the atom and the cell—are organized units; it is that very organization which gives them the fundamental dynamic force accounting for the emergence of matter or life.

The concept of organization brings us back to the very common expression in everyday speech that 'together we stand'. The actors undertaking a given project will, indeed, be in a stronger position if they are united. In some cases, however, unity may represent almost too great a strength: language may then shift imperceptibly from the singular into the plural, for example, when the French speak of 'networks' as in 'mafia networks', the use of the plural gives natural emphasis to the strength of an organization which unfortunately inspires fear.

Enough of semantics. Let us now consider the concept of the network in its broadest and most topical form—the Internet: for the last two or three years, when the term net-

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work is used, Internet springs to mind. For the English-speaker, the words 'net' and 'network' are interconnected and the Internet denotes an interactive communication system. The French Prime Minister, in a circular dated 15 May 1996 addressed to all members of his government and relating to State communication, information and documentation services on the new telecommunication networks, indicated that there is no question of national administrations failing to take up the challenge of the 1990s, namely the development of these new communication networks, and he makes specific reference to the worldwide Internet.

The network concept, nevertheless, goes beyond the field of communication alone: the official bulletin of the French Ministry of Education of 9 May 1996 contains a most interesting insert on agricultural education; one of the authors mentions, in an international context, the development of geographical networks specializing in agricultural training courses. The issue of the same bulletin published on 16 May 1996 contains an announcement about an international symposium on European training networks, which was held at Blois, to stimulate joint reflection on cultural, scientific and economic topics such as energy, European citizenship, on-the-job training periods or training institutes. Furthermore, the newspaper *Le Monde* of 16 April 1996 contains a half-page article reporting on the increasing tendency for doctors to work on a network basis.

## **Reasons for developing networking in school establishments**

What are the reasons for developing inter-school networking? Several of these, although different, are related to the idea of necessity:

1. The first reason is obviously the desire to ensure pedagogical continuity: there was a time, not so long ago, when this was made easier—in theory—by formal education being provided at a single location. At present, single locations tend to be an illusion: nursery schools, primary schools and lower and upper secondary schools are all to be found on different sites and, although some of them may sometimes be grouped together, it is more usual for them to be in separate geographical locations. If a coherent approach is to be adopted to each child's educational cursus, based on the idea of achieving educational continuity, it is essential, in a scattered geographical environment, to be even more attentive to the question of linkage: from a large nursery school section to the preparatory class and the first and second years of primary school, to the first to third years of secondary school, the fourth and final years of secondary school and post-baccalaureate studies; if many students fail in their first years of higher education, it is because some find the sudden change between school and university education a shock difficult to assimilate.
2. The second reason, familiar to people active in the field, is the need for many schools to give up the competitive approach, which may not necessarily serve the pupils' interests. All too often schools experience tough or even fierce competition, especially those which have to face a gradual whittling-away of their numbers in the medium term. In the case of upper secondary schools—as I myself witnessed when acting as Secretary-General for educational administration in the Paris region—many

- find themselves in a competitive situation, whereas their main aim should be to provide a coherent supply of training.
3. The third reason is a concern for realism: even if the secondary schools have for the past decade had the status of EPLE (*établissement public local d'enseignement*/local public education establishment), thus freeing them from their former legal status which restricted their capacity to act, and even if they now have the possibility of exerting real autonomy, their scope is limited in many areas, and one feels the limitations placed on them when it comes to engaging in activities and projects which have to be undertaken in association with several other establishments. This is the case, for example, of in-service training for staff: it may be advantageous for some training courses of a thematic or transdisciplinary nature to go beyond the scope of a single school in order to swap experiences and to reach, as much as possible, synergies. The same applies to group purchasing: if it is wished to obtain more advantageous prices, it is better to group together so as to benefit from a discount from suppliers for various products. It is therefore only realistic to take the view that the scope for action of a single school is, in several cases, severely limited.
  4. The fourth and last reason—but there are doubtless many others—which is related to those preceding it, is the idea of enhanced recognition of achievement promoted by François Bayrou, French Minister of Education, Higher Education and Research. In his book, which was published six years ago and has been republished several times since he took over the ministry, he argues—to quote his own words—that we are ‘sitting on a gold mine of achievements’, which are not acknowledged for their true worth. Enhanced recognition of achievement implies the ability to go beyond class or school frontiers and hence to communicate, exchange and share experiences and achievements; enhanced recognition of achievement automatically implies an approach which links schools and educational teams together in a network.

## The various stages in networking development

Let us now consider what are the various stages in the development of school networking in France. On 16 June 1994 at the Sorbonne, François Bayrou presented a series of decisions grouped together under the New School Contract (*Nouveau contrat pour l'école*—NCE). Several refer to the concept of ‘school networks’, one of them very explicitly, namely Decision 107 of NCE. In pursuance of that decision, a working group was set up to reflect on the matter.

The chronological landmarks include a report by Jacques Vaudiaux, Inspector-General of the National Educational Administration, previously rector in two educational administrations (Montpellier and Besançon), who in June 1995 submitted to the Minister of Education a consolidated report from IGAEN (Administrative Inspectorate of the Ministry of Education) on ‘networking in the different catchment areas’. A month later, the law of 13 July stipulated in its Article 3 that ‘educational establishments and, in so far as primary schools are concerned, the communes which are responsible for them, may join together by means of a convention to develop the educational and training missions

of those establishments and schools and to pool their human and material resources, with due respect for their competence'.

Other academic initiatives may be highlighted: in the Montpellier educational administration, Rector Blanchet and his associates developed a whole networking approach covering all the establishments under his responsibility. The Rheims educational administration took steps along similar lines. The third academy which is fairly advanced in this respect is that of Orléans-Tours: here again the rector took steps to see that this type of network association was developed and given special emphasis in two out of the five *départements* within his academy. Regarding the other twenty-five academies, it would be both inaccurate and inappropriate to think that no action had been taken, because each rector, since the New School Contract and Decision No. 107 of June 1994, is fully aware that this particular challenge should be given special attention.

Another factor which must be mentioned is the development of management informatics: after all, what is the application of informatics to 'schooling' if it is not the networking of statistical data to retrieve information from the academic databases, then from the central database, in order to facilitate the work of running secondary schools (*lycées* and *collèges*) and organizing evaluation and future planning with a view to preparing the next school year?

The latest landmark in this process is the establishment of 'Renater', which is the Internet site developed by the directorate responsible for new technologies for the education system. 'Renater', which was set up in 1995, is now being put into operation; it will be a highly effective and useful instrument for developing communication between educational establishments.

## **Inter-school co-operation: possible areas and scope**

Let us now examine the many possible areas for inter-school co-operation. Firstly, *the supply of training*: this should be organized in a coherent and complementary manner rather than through a competitive approach. This is already an important challenge, which in itself would provide sufficient justification for exploring the possibility of networking among school establishments. The second area of action is that of *guidance*: how to improve pupil guidance through the combined action of those involved in the education system? Another field is the integration of pupils, which may certainly be facilitated by a synergetic approach. Mention may also be made of the prevention of delinquent behaviour: pupils are not only learners but also young people who may be experiencing certain emotional or behavioural problems; and in that context the 'Open School' operation may be regarded as a form of networking in which the school succeeds in going beyond its usual confines from the point of view of its buildings, contact with the public and the school calendar.

*Cultural activities* may also be mentioned: the implementation of an interesting cultural project may be facilitated by involving several schools. In the field of *educational management*, grouped services are also beginning to emerge, in particular accountancy agencies, as well as the pooling of services for the remuneration of solidarity contributions (*contrats emploi-solidarité*—CES), for managing funds for the organization of educational

activities, etc. One must also mention the in-service training for staff or continuing education for adults, which has been developed over the past twenty years, recently through the establishment of school consortia (GRETA). Nor should we overlook the use of the new technologies, especially the link between networking (in the sense of working together), and the network (in the sense of informatics and telecommunications)—a topic to which we shall return later.

As regards practical methods of inter-school co-operation, the approach which seems to be most appropriate is a functional, rather than a structural one: there is no question of superimposing a new structure upon primary and secondary schools as a compulsory measure, because an approach of that kind would be doomed to failure. In any real economic situation, the idea of imposing a rigid structural framework would greatly detract from the very dynamism that should be encouraged. This is the reason why the word 'network' is not used in the text of the programming law: the expression recurring most frequently is 'pooling of human and material resources'. There should therefore be no question of advocating a restrictive approach which would run counter to the autonomy of the establishments; on the other hand, a functional approach is not incompatible with that autonomy. For autonomy does not mean living in an ivory tower or a citadel in splendid isolation: it implies the capacity to take action, to set up contacts with others, to embark upon projects considered as being of common interest, etc.

In this context, what role should be played by the authorities in the academies? It should be a subtle role aimed at stimulating, supporting and encouraging establishments to set up networking links. To take the example of the Montpellier educational administration, the rector there did not attempt to impose his authority, but he certainly took steps to stimulate a dynamic approach which is now proving effective. This is, of course, a relatively subtle way of tackling the situation—persuasive rather than authoritarian, yet not heavy-handed or inhibiting. In any case, the academic authorities cannot remain passive: they have a duty to intervene, as is expected of them.

Likewise in examining methodology, it is important to stress the concern for a realistic approach, so as to avoid transforming the networks into something artificial. Networking clearly relates to the idea of geographical space and more precisely to that of the school 'catchment area'. It is the academic authorities, the rectors and inspectors of the educational administration who are responsible for demarcating these catchment areas, in association with their partners in the economic field, as well as with other institutional partners (such as the representatives of labour departments and the secretaries-general for regional affairs in the prefectures).

### **Possible contribution to the revitalization of certain territories**

Rural areas undoubtedly provide an excellent terrain for the testing of networking: its development in various forms may enable the education system not only to fulfil the useful task of maintaining a coherent supply of education and training but, beyond that, to make a significant contribution to the revitalization of backward areas.

## **Maintaining a coherent supply of education and training**

In primary education, the objectives of coherence and quality go hand in hand: the first task is to set up the schools themselves, then to ensure coherent links between pre-primary and primary schools and also inside the primary school itself, within a reasonable geographical radius in terms of travel, satisfactory learning and cultural conditions for pupils and working conditions for teachers. Networking thus has a number of positive effects, such as:

- The maintenance of a coherent network of primary schools in a scattered rural setting;
- coherent follow-up of pupils with learning problems by providing specialized teachers, but also by establishing adequate school support;
- more rational use of certain sports and cultural facilities (libraries);
- the possibility of providing as many pupils as possible with an introduction to modern languages and high-quality education in art subjects;
- the development of pre-school education with proper nursery classes.

In secondary education, coherence may be achieved if schools take a concerted, complementary and non-competitive approach to the provision of courses, in particular from lower secondary school onwards, then for optional subjects in upper secondary school, and for vocational and technical education. Secondary schools in rural areas may, for example, 'share' a teacher for the second modern language, so as to extend the choice offered to pupils and their opportunities for entering upper secondary school.

## **A component in overall land-planning policy**

A coherent and complete training package from nursery school to the final year of secondary school, and even to post-baccalaureate education, may make it easier for adolescents to identify with their home environment and, until the end of their formal education, give them a real opportunity to choose whether to leave that environment or to stay and build their future there. With a better education, young people wishing to remain in rural areas will be in a better position to plan and set up local development projects and carry them through to a successful conclusion. The fact of bringing together children from different places often has in itself an important structuring effect, in that it influences the way in which they perceive the local environment; their horizon of references and relationships is less and less limited to the village and extends to the whole group of schools, first at intercommunal level, then at the level of the district and the region. A better knowledge of local educational structures would be likely to deter families and children from seeking education elsewhere out of a distrust for schools which they regard as too unfamiliar, although they may geographically not be particularly distant.

The establishment of a network of schools is itself related to a search for greater efficiency and equity, in so far as it tends to minimize the disadvantages, even though the facilities do not satisfy everybody to the same extent. It may also help to develop cultural infra-

structures and to anchor the family in a cultural context, thus dispelling the effect of geographical isolation in rural areas. It is possible to imagine 'the school establishment' (a concept extending to a series of schools in the case of a joint operating structure) as a place for 'cultural mediation' in the rural environment, which may give fresh impetus to the local voluntary sector in terms of both human and material resources.

## **The new information and communication technologies**

The new communication technologies are obviously an educational asset, because they can help to improve quality and effectiveness through the development of new educational approaches based on co-operative work, exchange of practices or pooling of resources and skills. In short, since the capacities of information technology are virtually unlimited, it is necessary not only to imagine how these new technologies could meet networking needs, but also to determine how they may be used in a reliable and economic way to support the policy reflected by school networking. The Larousse Encyclopedic Dictionary defines a computer network as:

a series of computers interconnected by digital links with a view to data processing or exchange of information. The network is intended to provide individual users with a series of services richer and more diversified than those provided by the computer to which they are immediately connected, through access to the other computers to which they are directly or indirectly linked within the network.

This can clearly be seen as a basic function relating to the processing and exchange of data, as well as an objective linking the sharing of resources with an improvement in the services provided, while ensuring both the overall reliability of the network and the density of the connections.

## **The use of new technologies in inter-school networking—a relatively little-developed area**

Although these technologies seem particularly well suited to school networking, their use in such a context is still relatively underdeveloped in France. Yet, they make it possible to reduce the disparities between rural and urban areas and to promote equal access to knowledge and learning; they bring greater flexibility into education and training facilities, enabling the demands of the individual and society to be catered for more adequately. Lastly, the ability to communicate, to work in shared teams and to give a worldwide dimension to certain activities—now essential factors in the emerging information society—must be taken into account in education, and justify the use of tools and services linked to the information highways.

An increasing number of documentalists and some trainers and school-teachers are beginning to consider or appreciate the possibilities of specialized information networks relating, for example, to educational sciences or other specific fields. The wealth of

resources provided by the most well-known documentary databases are only a modest foretaste of what may already be accessed on the international networks. Although access to this information is facilitated as the interfaces develop, it is increasingly acknowledged that the growing supply of information is such that the amount of monitoring required for following up a subject can hardly be sustained by a single individual; the disproportion between the availability of knowledge, on the one hand, and capacities of individuals on the other, automatically creates a need for co-operation and complementarity which form the basis of all networking.

Regarding the production of information itself, who better than documentalists are capable of gauging the amount of effort saved by using a documentary network for the reduction of indexing and bibliographical referencing, which are repeated a thousand times for one single work, in a thousand different establishments? The other side of the coin is, however, by no means negligible in this field, and many projects, both inside or outside the sphere of national education, have experienced, at their expense, very serious problems connected with the production of information: so much effort and expense can go into running superstructures to manage complex and sometimes disproportionately large collections, and this is compounded by the large number of co-ordination meetings and tedious learning processes that are required of individual members of the network—while the results may be modest. The high technological component of this type of organization may, under the stimulus of opening up new international prospects, lead straight to its becoming gigantic and to the stubborn belief that the more high-powered the vector, the more able it is to overcome the many difficulties facing human societies; the most false of these illusions is probably the idea that the power of the ‘whole’ is capable of solving the problems of the individual basic components. What can one say of networks whose mythical value serves only to conceal doubtful policies?

### **Some essential principles for designing operational information networks**

On the basis of the above, is it possible to deduce principles for the design of existing or future information and communication networks?

- The first task would seem to be to define the strategy behind the network in terms of: ultimate aims: sharing resources, combining skills or enhancing an institution; more or less long-term objectives; specific functions: collecting, preparing, disseminating, reporting or ensuring reliability.
- The actual forms of the network should also be described in detail in terms of: basic components (number, position, size, etc.); links (density, more or less free, etc.); relations (direction and quality of the flows); geometry (branching, star or grid structures); or methods of functioning (regulation, reliability, etc.).
- Thirdly, the identity for which the network is a vehicle needs to be defined in terms of: its formal designation (whether using official nomenclature or not); its culture (specific to a group, movement, period in time, etc.); its presentation: image, logo, communication activities, etc.
- Finally, it is necessary to agree jointly upon the methods for managing the commu-



nication network from the point of view of: management: centralization, stimulation, monitoring, etc.; production of data, both by the 'whole' (the network as a whole) and by each of its components; and cost/effectiveness ratio.

Far from exhausting the methods of approach to networks, these few indications should be placed in the context of an education system which may find a way of making fresh progress in this type of organization. Provided self-defence strategies are not developed, the networks can promote meetings or contacts with national or international counterparts. Yet it is also, and perhaps mainly, in the areas of complementarity and of seeking solutions elsewhere which cannot necessarily be found by individuals, that the networks, based on technologies which are now open to all the media, will be of the greatest service.

## **The Renater project**

The purpose of the Renater project is to set up within the French education system a communication network between upper secondary schools, lower secondary schools and primary schools; based on the twenty-eight educational administrations, it seeks to create, in liaison with the local communities, an effective educational network with access to the major international networks. Starting from action already undertaken but requiring fresh impetus, the Renater project is aimed at broadening reflection on the educational uses of the new communication tools and encouraging pooling of pedagogical resources between educational establishments, access to remote resources, co-operative work, sharing of skills and circulation of innovations, as well as uses relating to distance learning and distance training. The document introducing the Renater project shows that the call for proposals relating to the information highways and services sparked off considerable interest among those involved in education: for the school education sector alone, about twenty proposals came from administrations, public education establishments or regional or general councils in liaison with the Ministry of Education. Many of the proposals also contain a section relating to teaching and training.

## **Main trends for the education sector**

In the case of teaching, this project consists in developing the different uses corresponding to the need for renewal of the education system and for adapting training to the new demands of society. It is also intended to encourage the pooling of resources and skills so as to assist educational establishments in making use of their teaching facilities and to improve the overall performance of the system. The last aim, which is complementary to the first two, is to extend the supply of products and services adapted to the education system. Attaining those objectives implies carrying out a number of practical measures, and for this reason the proposed programme is structured along three main lines of emphasis.

### **ENCOURAGEMENT OF INTER-SCHOOL COMMUNICATION NETWORKS**

The French Minister of Education has taken a number of steps to promote the procurement of high-quality educational products, to provide schools with more adequate facil-

ities and to assist in networking of their internal resources, with a view to ensuring equal and universal access to these new tools. In the present context, which is characterized by the development of communication networks, the increasing quality of the interfaces and the decrease in equipment costs, the Internet and the Renater infrastructures certainly play a key role: they make it possible to set up a system in the schools which can facilitate the pooling of resources and help to open up schools to the outside world, in accordance with the facilities that they have available and with the aim of ensuring equality of access for all, and under conditions which are compatible with their operating methods, notably with regard to telecommunication costs. This approach, which is accompanied by resolute action with regard to contents, is carried out in close collaboration with the major public establishments and with a number of educational administrations and regional, general and municipal councils within the framework of the call for proposals concerning the information highways and services. It therefore forms an important component of educational networking. Platforms for user access may develop in the years to come; in the immediate future, those offered by the cable operators will be tested wherever possible; they are, in fact, likely to provide high-performance access to the Internet as a complement to new data-processing, telematic and audio-visual services, at rates compatible with the schools' operating methods.

This system, although heavily concentrated on formal education, should nevertheless be capable of gradually covering a variety of learning situations such as, for example, that of pupils learning at home; the present development of access to the Internet for the public at large is a positive factor in that connection. Lastly, special attention is given to the development of distance education applications and derivatives of tele-assisted learning or tele-tutoring, because they can help to lessen the disparities in training supply. Experiments being conducted at present in relation to global approaches associating various tools and networks, in particular videoteleconferencing, call for more detailed study, so as to make optimum use of the newly emerging technologies.

#### ENCOURAGING THE DEVELOPMENT OF PRODUCTS AND SERVICES ADAPTED TO THE NEEDS OF PUPILS, TEACHERS AND THE OTHER ACTORS IN THE EDUCATION SYSTEM

The document introducing the Renater project emphasizes the fact that one of the main challenges is the establishment of a structured supply of educational resources and services which take the needs of the users properly into account, in a system which is linked to demand. It is important to co-ordinate initiatives and enrich them in association with various partners providing educational contents, with research bodies and with publishers, so as to arrive at a coherent global project which is compatible with its different components at the national and regional levels.

A number of activities have already been launched with this in view:

- the establishment of a national networking focal point providing structured access to information, teaching resources and communication in the field of education;
- co-ordination between the Ministry of Education and its related public bodies: the Centre national de documentation pédagogique (CNDP—National Centre for

- Educational Documentation), Centre national d'enseignement à distance (CNED—National Centre for Distance Education), Office national d'information sur les enseignements et les professions (ONISEP—National Office for Information concerning Educational Courses and Professions) and the Centre international d'études pédagogiques (CIEP—International Centre for Educational Studies);
- the setting up of national working groups on specific disciplines and themes, to take into account the preparation of on-line products and services which are complementary to the locally available educational products and guides; parallel to this, partnerships are being sought with a number of organizations, especially cultural and scientific organizations;
  - collaboration with publishers, because the supply of on-line services from publishers of educational multimedia products is still very limited;
  - collaboration with other ministries, particularly the Ministry of Culture, in the field of art education.

#### OPERATING A TECHNICAL AND EDUCATIONAL MONITORING SYSTEM FOR TRAINING, THE ORGANIZATION OF EDUCATIONAL ACTIVITIES AND EVALUATION

The fact of taking the new communication tools and services into account in education is an encouragement to pursue current efforts to incorporate the new technologies into both disciplinary and interdisciplinary approaches, in particular through training courses at both the national and academy levels. Furthermore, the new communication tools may also make a valuable contribution towards promoting the use of new technologies in education by facilitating dissemination of experience, comparison of teaching practices and educational assistance.

### **Obstacles to development**

The development of uses linked to the new communication technologies obviously calls for considerable effort in terms of training, organization, supply of resources and educational services. These various aspects call for long-term action, but do not in themselves constitute obstacles, as uses may develop in certain areas and sectors before being gradually extended to the whole educational field.

The main obstacle is, in fact, the cost of telecommunications. This question is by no means a new one and numerous attempts have been made to solve the problem and, in particular, to produce a scale of charges which is compatible with the functioning of the various educational establishments. This point is currently being studied in collaboration with certain regional authorities, within the framework of project implementation. Work with the national telecommunication operator may make it possible to come to satisfactory solutions covering the whole of France; a working group, consisting of representatives of France Télécom, the Ministry of Industry and the Ministry of Education, Higher Education and Research, has been set up to examine this question.

## Conclusion

It may be pointed out in conclusion that the two connotations of the word 'network'—the fact of working together coupled with that of the new information and communication media—finally come together and situate the French education system in a real context of change, for both connotations are obviously complementary.

Communication, co-operative work, the pooling of resources and skills, with a view to improving the quality and effectiveness of education and promoting equality of opportunity through access to knowledge, are central to these various projects. Thanks to the greater flexibility made possible by these tools, a new public—those who are isolated or those who find it impossible to move—are and will be taken into account. The purpose of these projects is to increase the performance of the education system and adapt it to the social and economic realities of the community. This shows how important it is to facilitate their implementation, in association with all partners concerned.

## Note

1. Several of the points raised in this article are dealt with at greater length in a collective work entitled *L'association en réseau d'établissements scolaires* [Linking schools into a network], published in June 1996 by the Centre national de documentation pédagogique (CNDP) in the series 'Documents, actes et rapports pour l'éducation'; this work, to which about twenty authors have contributed, was co-ordinated by François Louis and Brigitte Trocmé.

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# COMPUTER EDUCATION

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## IN LEBANON:

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### STATUS AND COMPARISON

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### WITH SOME OTHER COUNTRIES

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*Hussein M. Yaghi<sup>1</sup>*

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#### **Introduction**

Since computers became personalized and affordable, heated discussions about introducing computers into educational activities has placed them at the forefront of renovation in education. Many researchers advocate the use of computers in education as an essential element in preserving the welfare of children by making them aware of relevant technologies and skills (e.g. Becker, 1992; Butler, 1985; Cavalier & Reeves, 1993; Chavez, 1993; Collis, 1993; Ely, 1993; Huh, 1993; Jegede & Okebukola, 1992; Kearsly, Hunter & Furlong, 1992; Makrakis & Yuan-tu, 1993; O'Neil, 1995; Orlich et al, 1994; Oteiza, 1993; Papert, 1980, 1993; Plomp & Pelgrum, 1990; Sheingold & Hadley, 1990; Sims, 1993; Stager, 1995; Stanchev, 1993; Taylor, 1980; and others). However, these researchers assert that 'this noble goal has been little realized, not in the poorest of nations nor even in the wealthiest.' (Cavalier & Reeves, 1993, p. 7). Consequently, many developing countries started to follow the international trend by introducing computers to schools for the purpose of teaching and learning activities, as well as for school administration.

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*Original language: English*

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As a developing country, Lebanon was no exception. Thus, computers appeared in a number of Lebanese schools from the early 1990s. The late introduction of computers to schools in Lebanon may be attributed to the war which dominated events in the country for over fifteen years—from 1975 until 1990. Before this study, no one had any clear ideas about the quantity of computers, the personnel involved, the softwares in use and the educational activities that were associated with them. In the absence of local field evidence, it seemed appropriate to conduct an exploratory study about the use of computers in education in Lebanon.

## The present study

The primary goal of the study was to establish a field-based agenda for the use of computers in education in Lebanon. The information in this paper was gathered during the academic year 1994–95. The scope of investigation was all Lebanese schools, and the objectives were:

1. To collect quantitative information about the availability of computers in Lebanese schools: the proportion of schools using computers, the type of computers employed, the ratio of students per machine, computer applications in use, and other related information.
2. To identify the existing provision of computers in terms of hardware and software and the qualifications of the personnel involved in computer education programmes.
3. To identify the trends of computer use in Lebanese schools, which entailed:
  - (a) the use of computers as instructional tools to deliver instruction in different subject matters. Under this category instruction may take the form of: computer-aided instruction (CAI), where the computer becomes an auxiliary to the teacher or the printed teaching materials; or computer-based instruction (CBI), where the computer is used to deliver instruction. These are the areas that have gained most of the attention in the use of computers in education. Considerable research has been focused on the role of the computer as a 'tutor' (Taylor, 1980). However, most of it indicates a weak effect of these techniques on learning (Cavalier & Reeves, 1993). Perhaps the accumulated field experience, research and the rapid improvements in computer-based communication technology will bring dramatic changes to the 'tutor' role of the computer. This is something yet to be seen.
  - (b) training students in skills such as word-processing, spread-sheeting and database management, where the computer becomes a productive tool. Ironically, this area—which has been generally overlooked by researchers—has now begun to receive attention. Some researchers agree that the 'tool' (Taylor, 1980) role of the computer has the greatest potential in improving educational practice (Cavalier & Reeves, 1993).
  - (c) creating an environment promoting higher-order thinking skills through programming whereby the computer becomes the 'tutee' (Taylor, 1980; Becker, 1992). The best illustrations would be using LOGO and LEGO LOGO in programming activities (Papert, 1980, 1993).

- (d) empowering the teacher with a performance support system that helps in conducting and organizing different educational activities (Cavalier & Reeves, 1993). In this function, the computer becomes an instructional management tool helping the teacher to increase efficiency in activities like test preparation, test correction, lesson planning, a research tool, etc. Here it is of great importance to mention the usefulness of computers in establishing and maintaining test banks and objectives banks. This function is the basis of what is called 'computer-managed instruction' (CMI).
- (e) using the computer as an educational subject by itself. That is, to dedicate time to discussing with students the importance of computers in contemporary society and to explain the different components of computer hardware and software concepts.

## Sampling

The selection of the sample was very much affected by the nature of schools in Lebanon. Lebanese schools are of three types that differ in many aspects:

- A. Public schools run directly by the government through the Ministry of Education. Even though these schools account for about 53% of the schools in Lebanon, they enrol only 31% of the students. This type of school was excluded from the sample simply because we already knew that they do not use computers.
- B. Semi-private schools receiving a governmental subsidy. This type of school accounts for 15% of the schools and 15% of the students. It was known to us in advance that some of these schools use computers; therefore, this type of school was included in the sample.
- C. Private schools that do not receive a governmental subsidy. Even though these schools constitute only about one third of the total schools in the country, they enrol more than one half of the students. It was known to us in advance that a number of these schools use computers; therefore this type of school was included in the sample.

We used the official list of schools provided by CERD (Center for Educational Research and Development, 1994) to select a random sample of schools representative of the different Lebanese regions. The random selection produced a sample of 358 schools enrolling about 186,000 students, consisting of 298 private schools and 60 semi-private schools. The proportions of school types in the sample approximate their proportions in the population of schools in the country.

## Instrumentation

A questionnaire was developed and used to collect the appropriate data from the schools in the sample. It contains 102 items: ten for general information about the school; thirty-four about computers and peripheral equipment and the type of software used; fifty-eight about the manner in which computers were used in the school in teaching computer skills. Before use, the questionnaire was reviewed by nine professors of education, computer sci-

ence and computer and communication engineering to verify the validity of the items. It was first piloted in twenty-five schools to verify its clarity and consistency. Confusing items were either restated clearly or deleted.

## **Procedure**

The method of collecting the information was by individual visits to each school in the sample. The questionnaires were completed by the research team through interviewing the concerned persons in each school. In schools that were found not to be using computers only the demographic section was applied, whereas the full questionnaire was used in schools that were found to be using computers. Through these visits, we were able to record additional important remarks which helped us to expand our understanding of computer education issues.

## **Data analysis**

Since the main objective of the study was to quantify the status of computer education in the country, frequencies and descriptive statistics, such as means and proportions, were computed for every item using SPSS (Statistical Package for Social Sciences). These statistics are reported throughout the following sections.

## **Results and discussion**

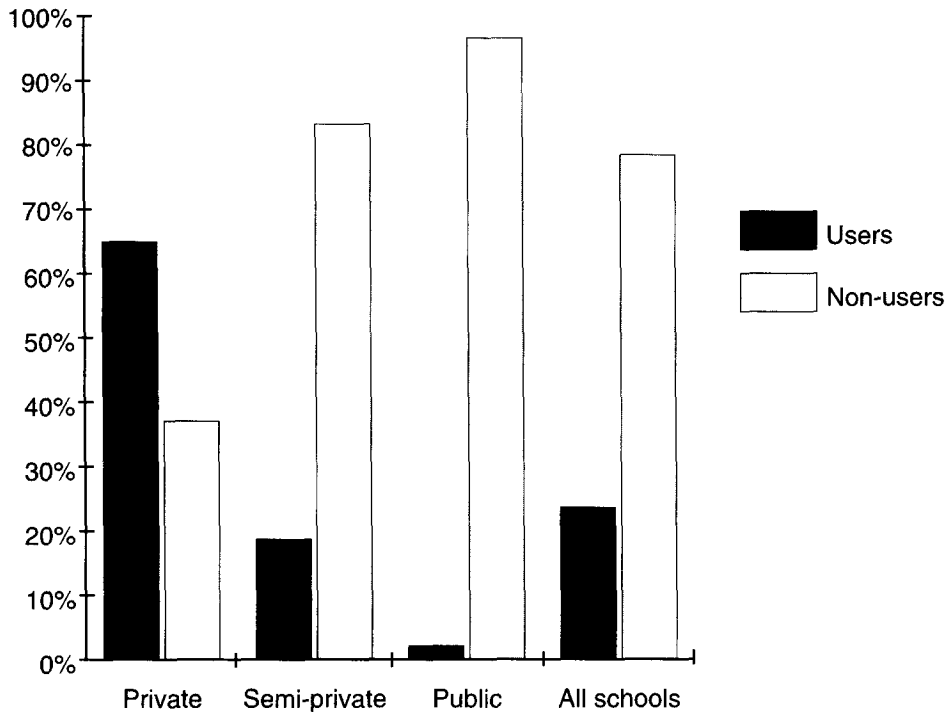
The collected information includes: computer hardware and peripheral equipment in use; educational software in use; the qualifications of the personnel involved in computer education programmes; and how computers are used in schools.

### **COMPUTER HARDWARE**

We found that 206, or 57% of the schools were using computers among the 358 schools of the sample. They were using a total of 3,507 computers with an average of seventeen computers per school. If we apply this figure to all the schools in the country, we estimate that there are about 660 computer-using schools in Lebanon, since the total number of private and semi-private schools is 1,159 (CERD, 1994) and we know that public schools do not use computers. Furthermore, we can estimate that there are slightly more than 11,000 computers in all schools (the total population of the country is about 3.5 million, and the total number of schools is 2,446). However, the distribution of these computers is highly disproportionate: 96% of them are being used by 65 private schools, and only 4% are being used by 18% of the semi-private schools. Students in public schools are deprived from the use of computers in education at school, except in a few isolated cases. However, the educational authorities are working on the idea of introducing computers into public schools in the 1997/98 school year. If we then consider all types of schools in Lebanon, the percentage of computer-using schools drops to about 23%, which



FIGURE 1. Comparing the proportions of schools that use computers to those that do not in each school type



means that more than three-quarters of the students in Lebanon do not have access to computers.

The density of students per computer is about 95 students per machine at the national level and 67 students per machine in private schools. Figure 1 compares the proportions of computer-using schools with non-computer-using schools in each school type.

If we compare access to computers in Lebanese schools to that in developed countries, we find great differences. For example, 98% of schools in the United States of America use computers (O'Neil, 1995; Orlich et al., 1994; Ely, 1993) and virtually every student has potential access to a computer, and the average density of students per micro-computer was estimated to be about nine in 1995, according to a recent Office of Technology Assessment (OTA) report (O'Neil, 1995). Likewise, most students in Western Europe have access to computers; computer education is even compulsory in some European countries, such as Denmark and the United Kingdom (Collis, 1993), which implies access to computers by every student at every school.

As for the type of hardware, computer equipment in Lebanese schools is similar to that in many other countries. Most of the existing machines are low-end IBM clones and Macintosh models. New and updated models are less common; for instance, only 20% of computer-using schools have CD-ROMs and are capable of using multimedia techniques, compared to 30% in the United States (O'Neil, 1995). As far as connectivity and network communications are concerned, we found that the use of networks is lim-

ited to local area networks (LANs) in a small number of schools in the country. As for access to printers, we found that the number of them was less than one printer for every 100 computers. Confronted with such a situation, one can conclude that teachers and students will very rarely have opportunities to use printers, which considerably degrades the quality of computer services.

#### SOFTWARE

Since Lebanese schools are multilingual, they frequently resort to Western languages, mainly French and English, in addition to Arabic, the national language. For example, 53% of them use French, 21% use English, and about 25% use both English and French in teaching mathematics and sciences (Centre for Educational Research and Development, 1994). In addition, French or English are taught as subjects in a number of teaching periods equal to that of Arabic. For this reason, most schools find it easier to conduct computer-related activities in French or in English rather than in Arabic, and the same software familiar to users in North America and Europe may be found in Lebanese schools, except for a small number of Arabic or 'Arabized' software. A limited number of schools teach Arabic computer applications, especially Arabic word-processing.

Possession of original software is generally poor in Lebanese schools. The majority of the schools (70%) said they did not own any original software beyond the operating systems, and only a small number of schools said that they own more than 100 pieces of original software including original educational CD-ROMs. Access to updated publications about computers is also poor. Sixty-three per cent of the computer-using schools reported that they did not have any subscriptions to publications about computers, 50% stated that they did not possess any books on computers and only a small number of schools own more than 100 books or manuals about computers.

Decisions about the content of computer education activities were taken either by the school principals and the computer teacher jointly (37%), the computer teachers alone (33%), or by the school principal alone (23%). School administrators and subject teachers rarely intervene in such decisions (a total of 7% in various combinations with other personnel).

The lack of central reference for decisions about the content of education using computers calls for a unified computer education curriculum. Even though great differences existed in applying the way of teaching computer applications and programming, the common use of application packages and programming languages may constitute an initial core for a computer education curriculum.

#### PERSONNEL

The dominant pattern from the point of view of staffing was that computer education activities were handled by individuals with technical qualifications who lacked educational training. We found that nearly all persons in charge of computer laboratories or conducting teaching were either hardware engineers or software programmers with no educational qualifications, i.e. no computer education degrees, not even having attended training work-

shops. Most schools (81%) were employing full-time staff with computer science or computer engineering degrees. About 12% of these employees have masters degrees, 50% of them have B.Sc./B.Ed. degrees, and 31% of them have two-year diplomas. Most schools (70%) used the same person as computer lab supervisor and computer teacher. Perhaps the computer teachers' and computer lab supervisors' technical qualifications explain the tendency in giving more weight to technical skills in computer education programmes in Lebanese schools.

As for the general computing abilities of all teachers, 48% of schools stated that none of their teachers, other than the computer teacher, were able to use computers. It was estimated that only about 10% of all teachers are able to employ computers in any teaching task. Again, when compared to the situation in the United States, where virtually every teacher has access to computers according to the aforementioned OTA report (O'Neil, 1995), the situation in Lebanese schools is far from satisfactory. The problem of teacher qualification raises a very serious question: How do we expect teachers to use computers in educational activities if about 85% of them do not know how to use computers?

Many educational authorities and higher education institutions in the world are now aware of the issue of teacher readiness in order to introduce computer education programmes successfully. For example, in order to obtain teaching credentials, California requires that teachers should show evidence of course work in the use of computers, including knowledge about: (a) computer issues related to education; (b) basic computer operations and terminology; (c) computer hardware and software components; (d) the use of common computer applications such as word-processing, spreadsheet and data-base management; (e) integrating computer-based education into the curriculum (California Education Code, cited in Rosen & Weil, 1995). Likewise, the Chinese and the Bulgarian educational authorities have launched massive teacher-training programmes to familiarize students with computers (Makrakis & Yuan-tu, 1993; Stanchev, 1993). Similarly, the educational authorities in Chile provided television programmes for teachers dedicated to distance learning on the LOGO programming language (Oteiza, 1993).

Teacher training in computer familiarization, whether pre-service or in-service, is gaining attention worldwide, yet none of the universities in Lebanon have a computer education programme, nor are there as yet any large-scale in-service teacher-training programmes.

#### COMPUTER EDUCATION ACTIVITIES

Most computer-using schools (68%) started their computer education programmes at the elementary level and continued on to the secondary programme. However, a smaller number (20%) only started at the intermediate level. Most of them devote only one period a week to this subject which they alternate between different types of activities in computer use, and most of them said that they do not provide computer education services to their students outside the regular teaching hours.

Almost 60% of the computer-using schools charge their students additional fees for computer usage. Such fees are very often mandatory, regardless of the quality of the services. In many cases, most of the revenue from these fees goes to companies who have con-

tracts with the schools. These companies provide not only consultations, but also actually conduct the computer education activities at the school sites. The most common pattern was that the companies provide the machines, install them at the schools sites and provide computer teachers who are not regular members of the school staff. Since these are commercial companies, they tend to concentrate on providing low-cost machines while cutting down on teaching time and other costs to increase their profit margin. Nevertheless, the remaining 41% reported that they were self-sufficient in computer education and preferred to carry out the entire operation on their own. It would seem that contracts with computer education companies are related to the lack of knowledge within the school about computer education and a lack of trained personnel.

The surveyed computer education activities were grouped into three categories: training in computer skills, teaching subject matter through computers, and teaching about computers.

### *Teaching in computer skills*

The reported skills include keyboarding, operating the computer, word-processing, spreadsheeting, data-base management and computer programming. There was a wide range in the frequency of teaching these different skills. The most frequent skill was, naturally, keyboarding (93%), followed by knowledge of the operating system (62%), then programming with either LOGO or BASIC and in a rare case with Turbo Pascal (59%), English word-processing (51%), French word-processing (45%), Arabic word-processing (33%), data-base management (17%), and finally use of spreadsheets (16%).

Although basic computer skills are being taught in Lebanese schools, which is consistent with what is happening elsewhere in the world, the frequency of teaching these skills is different. It is, for example, lower than the frequency practised in the United States. Sheingold and Hadley (1990) reported that computers in North American schools were used for: text processing (93%); drill and practice (92%); educational games (91%); programming and operating systems (84%); communications (49%); and multimedia (25%). In another study conducted the same year, Plomp and Pelgrum (1990) confirmed a similar order of frequency of computer activities for word-processing, drill and practice, educational games and tutorial programmes. Furthermore, new technologies are being integrated into computer education in schools in the United States, thus creating new learning opportunities. For example, OTA reported students conducting educational tasks using advanced multi-media techniques locally or via networks (O'Neil, 1995). Likewise, teaching computer skills is well integrated into the school activities of most Western European countries. While the Europeans emphasize word-processing and programming with LOGO at the elementary and intermediate levels, they offer comprehensive programmes at the high-school levels, including data-base management and programming in higher level languages—which are compulsory in some countries (Collis, 1993). In like manner, Bulgarian high schools require their students to pass a 120-hour course in computer programming, in addition to training them in basic computer skills (Stanchev, 1993).

*Teaching subject matter through the computer*

The investigated activities in this category involved using CBI or CAI in teaching different school subjects. On average, about 31% of the computer-using schools said they were using computers in teaching or in drill and practice exercises in different subjects. The most frequently used was CAI in mathematics exercises (53%), then science exercises (44%), French-language exercises (37%), English-language exercises (25%), social studies (23%), visual arts (22%) and lastly Arabic language (10%). The computers were rarely used in CBI activities, except for some schools which reported using them during the teaching of some mathematical concepts. The relatively higher frequency of using computers in science and maths activities is perhaps rooted in the misconception that computers are more associated with mathematics and sciences.

Knowing that the average amount of time dedicated to all computer education activities was about one period per week, we can easily conclude that the time devoted to CBI and CAI activities was very low, since this time is also used to teach computer skills. Thus, it is safe to conclude that the impact of CAI and CBI in education in Lebanon is still very limited. This kind of limitation is not restricted to Lebanon or to developing countries; researchers have documented it in developed countries as well. For example, Ely (1993) and the Metropolitan Educational Research Consortium (1993) concluded that computer-based instruction has had minimal impact in schools in the United States. However, noticeable gains were reported where deliberate efforts by individuals were made. Likewise, in Australia, computer use in different educational activities was far from the level that has often been predicted, even though a great number of Australian schools are using computers (Sims, 1993). Once again, noticeable achievements were reported in schools with unique experiences. There was, for example, the experience of the school in Melbourne that required every student and teacher to have a laptop computer and use it in a variety of school activities (Stager, 1995).

*Teaching about computers*

Sixty-one per cent of schools stated that they dedicate time to teach their students the importance of computers in modern life and to instruct them about the computer's hardware and software components and concepts. However, this amount of time was too short to satisfy the topics.

**Conclusion**

One basic remark is that Lebanese schools are trying to adopt computer familiarization education, albeit in a modest and rather chaotic manner. There were hardly any schools with the same computer education programme. Each school was finding its own way, depending on the resources available. Unlike other subjects of the traditional curriculum, there was no unified curriculum for computer education. Some common trends may be identified however. For example, the great majority of schools were teaching computer skills, teaching programming, using computers in the teaching/learning of different sub-

jects and teaching about computers. Thus, these activities may constitute the backbone of a computer familiarization curriculum. It is obvious that the ingredients of these components should be carefully crafted to suit grade levels and students' abilities.

Though the proportions of time devoted to computer education varied from one school to another, the overall trend was that the time allotted for computer education activities was too short, resulting in limiting the access of students to computers. The frequency of using computers as support devices in teaching and learning different subjects was also limited, as was the amount of time set aside for that activity. Therefore, longer and more frequent access time slots should be considered when planning education programmes using computers.

To a large extent, the shortage of professionally trained personnel made computer education subject to the influence of hardware dealers. The market is dominated by non-professional opportunists who are motivated by financial profit, and schools were providing such opportunists with plenty of scope.

Another striking observation is that only about 10% of teachers are able to use computers. This percentage is expected to be even lower in public schools. One can conclude, therefore, that it would be hopeless to try to introduce all aspects of computer education without massive in-service and pre-service teacher training. How can teachers be expected to use CBI, CAI and teach computer skills if they do not know how to use computers themselves? In fact, there are certain schools in the country that became aware of this problem and have started training all their teachers in different computer skills. There are also universities that have begun to teach specialized computer familiarization courses, and we may witness the establishment of specialized complete computer education programmes at some of the country's universities and teacher-training colleges.

Perhaps Lebanon is now presented with a special opportunity to rebuild its educational system with the huge reconstruction projects taking place in many domains after the cessation of the civil war. The government has plans to renovate the education system, and these plans should address technology-related issues.

## Note

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## References

- Becker, H.J. 1992. Computer education. In: Alkin M.C., ed. *Encyclopedia of educational research*, p. 232–35. New York, Macmillan.
- Butler, P.A. 1985. Research notes. *Journal of educational computing research* (New York), vol. 1, p. 121–25.
- Cavalier, R.; Reeves T.C. 1993. International perspectives on the impact of computing in education: introduction to special issue. *Educational technology* (Englewood Cliffs, NJ), vol. 33, no. 9, p. 7–10.
- Center for Educational Research and Development. 1994. *Statistical report for 1993–1994 school year*. Beirut, CERD Press, Ministry of Education.

- Chavez, E.O. 1993. The impact of computing in education in Brazil. *Educational technology* (Englewood Cliffs, NJ), vol. 33, no. 9, p. 16–20.
- Collis, B. 1993. The impact of computing in education in Europe. *Educational technology* (Englewood Cliffs, NJ), vol. 33, no. 9, p. 37–41.
- Ely, D.P. 1993. Computers in schools and universities in the United States of America. *Educational technology* (Englewood Cliffs, NJ), vol. 33, no. 9, p. 53–57.
- Huh, U. 1993. The impact of computing in education in Korea. *Educational technology* (Englewood Cliffs, NJ), vol. 33, no. 9, p. 42–47.
- Jegede, O.J.; Okebukola, P.A. 1992. Adopting technology in third world classrooms: students' view point about computers in science teaching and learning. *Journal of educational technology systems* (Warrenton, VA), vol. 20, no. 4, p. 324–27.
- Kearsly, G.; Hunter, B.; Furlong, M. 1992. *We teach with technology: new visions for education*. Wilsonville, OR, Franklin, Beedle & Associates.
- Makrakis, V.; Yuan-tu, L. 1993. Informatics, development and education: the case of China. *Educational technology* (Englewood Cliffs, NJ), vol. 33, no. 9, p. 31–36.
- Metropolitan Educational Research Consortium. 1993. *Learning technologies in the classroom: a study of results*. Richmond, VA, Virginia Commonwealth University.
- O'Neil, J. 1995. Teachers and technology: potential and pitfalls. *Educational leadership* (Alexandria, VA), vol. 53, no. 2, p. 10–12. (Office of Technology Assessment report.)
- Orlich, D.C., et al. 1994. *Teaching strategies*. 4th ed. Lexington, MA, D.C. Heath & Company. 400 p.
- Oteiza, F.L. 1993. The impact of computer technology on schools in Chile. *Educational technology* (Englewood Cliffs, NJ), vol. 33, no. 9, p. 25–31.
- Papert, S. 1980. *Mindstorms: children, computers, and powerful ideas*. New York, Basic Books. 230 p.
- . 1993. *The children's machine: rethinking in the age of the computer*. New York, Basic Books. 241 p.
- Plomp, T.; Pelgrum, W.J. 1990. *Introduction of computers in education: state of the art in eight countries*. Paper presented at EURIT 90, Herning, Denmark, April 1990.
- Rosen, L.D.; Weil, M.M. 1995. Computer availability, computer experience and technophobia among public school teachers. *Computers in human behavior* (Tarrytown, NY), vol. 11, no. 1, p. 9–13.
- Sheingold, K.; Hadley, M. 1990. *Accomplished teachers: integrating computers into classroom practice*. New York, Center for Technology in Education, Bank STREET College of Education.
- Sims, R.C. 1993. Computer-based training and education: an Australian perspective. *Educational technology* (Englewood Cliffs, NJ), vol. 33, no. 9, p. 11–15.
- Stager, G. 1995. Laptop schools lead the way in professional development. *Educational leadership* (Alexandria, VA), vol. 53, no. 2, p. 78–81.
- Stanchev, I. 1993. The impact of computing on education in Bulgaria. *Educational technology* (Englewood Cliffs, NJ), vol. 33, no. 9, p. 21–24.
- Taylor, R. 1980. *The computer in the school: tutor, tool, tutee*. New York, Teachers College Press.

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# TRENDS/CASES



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# COULD GOOD QUALITY EDUCATION BE PROVIDED MORE CHEAPLY? <sup>1</sup>

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*Inés Aguerrondo*

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Improving education and making it accessible to all is a costly process. In today's world not every society can afford such a luxury, especially those burdened by a multitude of economic and financial problems and the challenge of repaying their debts and implementing structural adjustment programmes.

At the same time it is becoming increasingly clear that a country is not viable until its population reaches a decent level of education. It is thus more important than ever to obtain funds and use them properly, without waste or inefficiency.

While growing interest is shown in the problem, solutions have yet to be found. Linear, uni-disciplinary analyses abound, but they are unlikely to yield alternative solutions. The solutions proposed by education specialists are often economically unworkable because they are not, in general, based on rigorous economic feasibility studies. In sectors more accustomed to economic analysis, educational reform is viewed solely in terms of the cost of the services supplied; the general criteria of budgetary analysis are applied but the special characteristics of public education are overlooked.

An increasing number of questions are thus being raised. Clearly, there are more questions remaining open than answers found.

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*Original language: Spanish*

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## The paradigm underlying the organization: assumptions

Like other basic social structures, systems of education have developed throughout history to meet specific needs.

The organization of these systems—the elements composing them and the way in which their parts are related—takes specific forms, which have evolved in response to societal needs. It also reflects different ways of looking at the basic elements providing for the satisfaction of those needs.

The central organizing principle in education systems is *society's need to produce basic knowledge and transmit it* to the entire population. Schools are organizations, the fundamental purpose of which is to ensure that all members acquire the knowledge needed for the functioning of society. Increasingly, this means that the participation and access of all individuals to the material and cultural wealth of society must be provided for.

## Educational assumptions

The institutions that were developed to achieve that objective were based on educational assumptions—the purpose of which was to ensure that a certain body of knowledge would be transmitted to the entire population. The way educational assumptions are defined is important because they determine the form of the educational model, in other words, the specific material elements that drive the learning process, and the material resources needed for it.

The most important assumptions of the traditional model of education, which still prevails, deal with the following questions:

- What is meant by knowledge?
- What is meant by learning? and
- What is meant by the content of education?

According to the traditional model, knowledge means a human activity the purpose of which is to describe and explain phenomena occurring in the real world in order to generate theories that can predict their behaviour. Knowledge, then, is geared to the production of theories. The goal of education is therefore to acquire knowledge that is essentially theoretical in nature: more recent approaches such as research and development were not yet in operation when present education systems were designed.

Specific consequences of this approach include the organization of learning essentially by means of textbooks and manuals and, at a later period in history, the decision to define the relationship between education and work by a particular kind of school (technical) which combines traditional education with practical experience (workshops) and whose structure responds to commercial rather than educational needs (Gallart, 1988).

According to the traditional model, learning is a stimulus-response process in which individual effort, the stimulation provided by textbooks and the influence of the teacher on the students are crucial. The relationship between teacher and student has to be direct, personal and ongoing. This model stipulates the number of students per teacher; the assump-

tion is that the quality of education improves substantially when the number of students per class is restricted. It also follows from this model that students have their own desks and work as isolated individuals. They are not supposed to talk or work with a partner. They work for themselves rather than taking on a role in the group.

Lastly, the curriculum associated with the traditional model of education consists of the fundamentals of each subject, which very often turns out to be basic descriptive data (dates, facts and figures). The result has been the triumph of memory over reasoning, the assumption that learning can only take place in school and the belief that only the knowledge gained in school is valid.

Each assumption on which the traditional model of education is based has resulted in specific organizational (and economic) structures, which have been carried down through centuries and never called into question.

## Demographic and territorial assumptions

Besides being built on these basic assumptions, the organizational model for education systems was defined at a particular moment in history, in societies with specific characteristics. These education systems emerged with the development of industrialization in Anglo-Saxon Europe, in response to its specific needs. Their distinguishing features correspond to the realities of that environment.

For our purposes, their most notable features are the following:

- A set of particular demographic variables at a time when population distribution was becoming rapidly more centralized. A process of urbanization was under way at that time, parallel to industrialization. The traditional education system thus assumes dense concentrations of population rather than dispersed settlements. In Latin America, for example, the system functioned relatively well in densely populated urban areas but was not an appropriate solution for regions where the population was more spread out.
- A territory that is not too large, which implies specific possibilities for movement and communication of a specific level of complexity. This is another condition that is not met in Latin America, where the territories are very large and communication relatively complicated and difficult.
- Dynamic and growing economies which are able to maintain or, as population patterns change, increase spending on infrastructure, personnel, equipment and operating costs. This is a third condition which is not met in Latin America, where economic growth typically entails severe structural imbalances.

## First question: what are we paying for?

Studies of the cost of education usually break it down into various categories based on fundamental economic concepts. The most frequent categories are recurrent expenses and capital outlay, inputs, processes and output. The return on educational investment is also frequently evaluated in terms of the difference between input and output as a function of the number of years of education, or the cost-benefit ratio of the investment.

Economists and administrators tend to be guided by such considerations in the allocation of resources, whether in the private or the public sector. The straightforward application of these economic categories to the field of education gives rise to a number of technical problems that are recognized by many economists.

Consequently, those efforts have at times been criticized for being overly economic in their focus despite the fact that they provide valuable macro-economic data that undoubtedly cannot be excluded from the decision-making process at the State and national levels. At the same time, decisions should not be made solely from that perspective.

Reorganization efforts, in the area of production for example, have shown that it is possible to restructure a system so that it not only costs less but also produces better quality results.

This process, while fairly advanced in other social sectors, has yet to reach the field of education.

## **Second question: savings from which perspective?**

The enrolment of the whole population in education combined with the new demands made of it by society led to a series of deviations from the original model. The decades-long divergence between the educational and economic viewpoints made it difficult to grasp the economic consequences of this phenomenon immediately.

Variations in unit costs became so flagrant as to be untenable, and very difficult to justify in terms of the quality of the results. There were significant differences in the cost per student from one school to another, even at the same level of education and between schools with similar profiles, and studies showed that quality of education had little to do with the cost per student or teachers' salaries.

At the same time as education specialists were warning about the educational problems inherent in this model, economists were increasingly of the opinion that the education system was functioning at a deficit, resulting in wastage which increased costs. Savings could be made if these anomalies were reduced. The question is: if this model were to function properly, how much money would actually be saved? There are two approaches to this question.

- (a) *Costs can be reduced by eliminating the wastage caused by inefficient administration*

Here, decentralization takes centre stage, along with increased autonomy for the individual schools.

Education systems were originally grand structures whose basic purpose was to give substance to the concept of the nation-State, but for the past century and a half they have been distorted in various ways, becoming tools of political influence, employment-generating schemes or a means of absorbing or anticipating social protest.

Today, in response to the need to prune State bureaucracies, the most commonly proposed solution is decentralization—from the federal level to the provincial level and from the provincial to the municipal—and this brings increased autonomy to the schools.

In the last two decades, on the basis of certain examples, questions have been raised about the economic advantages of decentralization and have taken into consideration doubts expressed about its impact on educational quality and on social equality (Prawda, 1992).

We are beginning to learn from experience that decentralization is not always the least expensive and most cost-effective approach. Furthermore, to avoid creating a new set of problems, differences have to be carefully balanced by compensatory mechanisms (requiring further spending), which can only be effectively implemented by a more centralized structure.

It is clear that if a larger body (national or federal) fails to take compensatory measures, the gap between rich and poor provinces (and rich and poor schools) is likely to widen, and inequalities will also increase as less resources are allocated to education and health, for example. In other words, there is no guarantee that decentralization, in itself, will be effective in ensuring equality or breaking the vicious circle of poverty and underdevelopment.

In education there is less reliance on approaches that are relatively standard in other sectors. One example is the economies of scale approach, which might be used to determine the optimal size of a school from an economic point of view, taking variables such as the importance of the organization's fixed costs<sup>2</sup> in overall expenditure or the ratio of administrators to teachers (Argentina, 1995).

There is one question that is taboo in this area and that is the question of class size. General acceptance of the traditional paradigm has firmly established the view that the quality of education is related to class size. Although the relevant research shows that class size is one of the least important factors in determining quality, the magic number is set by teachers and parents alike at between twenty-five and thirty pupils per class.

At the same time, other factors which are known to have a strong impact on the quality of learning and do not entail additional costs, such as ensuring that all the time children spend at school is occupied with educational activity, have until very recently not been used to improve the yield from educational investments.

(b) *Costs can be reduced by eliminating the wastage caused by inefficient teaching*

School systems in Latin America have been constantly expanding in recent decades. Coverage in the Southern Cone and some Central American countries is now nearly universal, and the remaining countries have made a great deal of progress in that direction. Nevertheless, expansion of the traditional model of education without adapting it to the needs of the new population groups covered has given rise to another problem: an increasing number of repeaters, especially in the first grades.

The large proportion of repeaters represents an annual loss for the region of \$1,000 million; current policies must therefore be changed radically to put an end to this wastage. Every year in the ten South American countries about 10 million students fail to move up to the next grade, and the average cost per student is \$100. The problem of repeaters should therefore be addressed as quickly as possible (Schiefelbein, 1989).

In terms of overall costs, a repeater uses twice as much education time as a pupil who

progresses normally through the grades, and thus uses double the resources as more places must be made available and more schools and teachers are needed.

### **Third question: how much does this 'tinkering' with the model actually cost?**

There was a time when educators constantly asked themselves this question. In the 1930s it was already clear that the existing structure was producing what are generally described as school failures or low output.

It is noteworthy that all the remedies suggested by educators—and put into practice—entailed an increase in costs, perhaps because it was only recently that the traditional model of education has been called into question.

When school failure was blamed on poor nutrition, school lunches were instituted. When it was attributed to learning difficulties, psychoeducational counselling services were set up in schools and special education teachers were hired, not to mention the social workers brought into work with disadvantaged populations and the 'hotel' services offered in State boarding schools.

In short, the traditional model was so monolithic that the only way to remedy its shortcomings was to add new personnel or services; the possibility of changing the model, reassigning personnel or redistributing tasks was never considered.

The cost of 'tinkering' with the traditional model has rarely been calculated except in terms of the rate of repeaters, which is a final outcome. The cost increases associated with measures to combat school failure are usually not taken into account in evaluating the cost of education.

However, tinkering with the original model is not a characteristic of our region. In the countries of the central zone a different style has been adopted. It has frequently been suggested that one way to remedy the poor performance and the poor quality of education would be to invest heavily in computer technology in the hope that the traditional model could be improved by the incorporation of computers and high-quality software.

This could be seen as one more example of the isolation of the education sector from the rest of society, since that strategy has already proved unsuccessful in other fields. It is clear that a traditionally structured company will not be able to solve its problems of productivity and competitiveness simply by resorting to computerization. Similarly, the current educational structure cannot be improved simply by more investment in technology.

Since we are not at that point yet, our basic concern is where to look for more funding for education.

### **Fourth question: where can more funding for education be found?**

There is a general clamour for more investment in education. It is not unusual for experts, connecting the public utility of education directly with the State's obligation to pay for it, to propose financially unworkable solutions.

Similarly, attempts were made to define ideal financing patterns; it was suggested, for example, that a specific percentage of the national budget or of the gross national product should be spent on education. These ideals were immediately adopted as basic principles, as the resources assigned in practice always fell short of the level proposed as the ideal.

It should first be noted that in this field relative values provide little information. There is the minimum (or basic)<sup>3</sup> cost of providing the service and it is therefore the amount per student—in absolute terms—that determines what and how much can be done. But the problem is that, while the *per capita* cost of education may be low—which is often in fact the case—it is high in comparison to the economic capacity of the countries of the region.

The proposed solutions are always the same: restructure public spending by reducing the military budget, for example, or tap non-traditional sources of funding, which basically means private sector investment. In addition to proposing specific taxes to finance particular areas of education such as vocational training, a number of ideas have been put forward which would also require additional funding from the private sector.

One approach is to oblige businesses to invest in education by making them responsible for providing the specific training needed for the jobs they offer, after general education has been provided by the State. Another approach is to get families to pay part of the cost of education by distributing educational 'vouchers' to families which would then submit them in payment, or partial payment, to the school their children attend. A third approach is to encourage community investment, for example by making education the responsibility of local authorities; funds must then be provided directly or indirectly (by increasing local taxes) by the community in which the school is located.

Yet, here again, these major investments generally end up simply financing more education based on the traditional model. And it is not simply increasing the amounts allocated to education that will improve quality.

Judging by the results in countries which have intensified investment in education, substantially increasing the allocations to that sector in a short period of time, this is an inadequate response and only solves part of the problem. A case in point is the United States which, in one decade (1982-1992), doubled its investment in education without any significant change in results.

## **The new questions: where are we starting from?**

There are various vantage points from which new questions may be raised. First, it is important to recognize the realities of Latin America—in terms of restrictions and material conditions.

Two main aspects merit consideration: how much is being invested per capita (or what is the available investment per capita); and what demographic and territorial conditions need to be taken into account. Obviously, we must not resign ourselves to existing levels of budgeting, and education systems must continue to fight for a larger allocation of resources. Nevertheless, increasing the budget is a gradual process and cannot be achieved overnight.

Once the basic amount has been determined we can establish whether or not it is sufficient, providing that the real minimum cost of the traditional model of education is known.

Having dealt with this issue, new ones emerge: what is the limit of flexibility of the model or, put another way, how high can the minimum cost of the model go (one teacher for so many pupils of a particular age, special buildings for education, etc.)? That leads to another question: the type of organizational structure. A related problem is the scale: what is the optimal size? Is it always the same? Under what conditions should it vary? What is the range of acceptable variations?

It is also clear that the countries with the most effective and efficient education systems make the largest investments per capita, which means that their systems are not the least expensive. In another words, in order to operate effectively this model of education is costly, at least by Latin American standards.

It is important to test the hypothesis that budgetary restrictions in Latin American economies make it impossible to provide high quality education for the entire population based on the traditional model of educational structure.

If this hypothesis were to be confirmed, then experts in education and economics should make it a priority to work together on solving that problem. The alternative is to continue to talk about providing quality education for all, knowing perfectly well that there is no chance of ever achieving this goal.

## **Could good quality education be provided more cheaply?**

Let us return to our initial question: could everyone be given good quality education more cheaply?

It cannot be said that there has been any lack of proposals for change in the field of education. However, except for 'deschooling', what is proposed is the universalization of the traditional model with various alterations produced by 'tinkering'.

Yet a feature of educational development plans in Latin America is their economic infeasibility, owing to inadequate cost analysis (and the low priority of education as a political issue). In reality, the educational sector in Latin America has grown and developed more in response to social demands than as a result of government planning (Rama, 1987).

Educators are isolated; so when faced with the need for reform they confine their efforts to the pedagogical aspects of education without any consideration of financial aspects.

In fact it is not easy to adopt a less circumscribed approach when the current structure is so monolithic that it is applied at every level and under all circumstances—whether the schools are urban or rural and whether they offer primary or secondary education. For example, enrolment is on the rise and the system is expanding; yet all we manage to do is to enlarge existing schools. No account is taken of the fact that effective and efficient educational services can be provided only by considering the context (demography, territory, cultural background of the students) in which they are offered.

For a time education specialists were the only ones making proposals for reform and



their solutions dealt essentially with the teaching process. Today economists and administrators, whose exclusive concern is administration, are coming up with a large number of proposals for educational reform, including decentralization in various forms, school autonomy, outcome evaluation and new management models.

Strictly speaking, what is being applied are already existing management techniques that can be used in any organizational structure, whether in the private or public sector. These techniques look new and are being presented as a fundamental reform of the system, when all they are doing is moving into an area once occupied exclusively by pedagogical issues.

This most recent approach has the clear advantage of taking costs into account. Various macro-economic models of organization are being costed. However, this approach generally deals only with administrative issues, leaving on one side the question of how accompanying educational reforms could be made in the schools and classrooms. The purpose is to reorganize the administrative structure of the schools.

As the basic assumptions of the current model are redefined, a new type of educational service may emerge. Another approach should take as its focus the reorganization of the central core of education—the student-teacher-knowledge triad, which would imply a restructuring of the other institutions within the education system.

For example, redefining knowledge by including the areas of research and development would mean providing space and time for activities that today's schools do not offer. It would also mean that students would no longer work individually, as they usually do now, and that interactive learning would become generally accepted in education.

A new educational approach would also entail organizational changes. For example, under the new model of education, interactive learning would give students the opportunity to play a more active role and to work in groups. These two changes would have an effect on educational organization and costs. Students who are playing an active role in their own education would take over many of the tasks which today are carried out by teachers (e.g. getting information, playing an active role in organizing tasks, self-evaluation and self-correction).

Group work makes possible a variety of ways of using classroom space and school time and allows teachers to carry out many other activities at the same time and in the same space. The same tasks at varying levels of difficulty might be assigned to different students or groups of students, leaving the teacher free to work with those who are having most difficulty. Alternatively, various different tasks could be assigned so that different groups of students can work simultaneously on different subjects depending on their needs. Both strategies have proved to be effective in preventing school failure. Without any increase in costs, the learning process can become more effective and the school drop-out rate reduced, resulting in considerably lower costs.

Carrying this line of reasoning a little further, the logic currently applied to the organization of education might be reconsidered, as a theoretical exercise. The idea would not be to accept every new suggestion but to give consideration to new alternatives and to raise some questions. These might include the following:

- What are the practical implications of the 'student as protagonist' and 'teacher as

facilitator' approach? Does it mean larger classrooms with more equipment? If so, what equipment, and how much would it cost? Would more equipment compensate for a larger number of students per classroom?

- What is a school? Does it necessarily imply a physical space? Do classes held under a tree constitute a school? Is there a difference between education and learning?
- Can pupils learn without the constant presence of a teacher? Under what conditions? At what age? What would replace the teacher—interactive teaching materials, textbooks, other items?
- What differentiates societies where children learn in groups of 50, 60 or even 100? Under what circumstances does class size determine educational achievement? What is the best size for a class?
- What would be the cost of a different, more efficient, supervisory structure? Would it be less expensive to hire teachers on an ad hoc basis? Would it be more efficient? Could some means of distance supervision be devised? What about focused supervision (focusing mainly or exclusively on schools in which it is most needed)?

One might conclude that no universally valid answers can be given to these questions. They depend on the context or circumstances. Yet the simple fact of exercising our imagination and trying to find answers brings us closer to devising a new approach that will help us to see how to bring quality education to all.

## **Devising a new approach (and its limitations)**

This brings us to three more questions. The first deals with the connection between budget and organizational structure. With existing resources and modes of organization, it is difficult to achieve acceptable standards of quality in education (i.e. there is little chance that they will be attained). This is a crucial difference between our region and the more developed countries. They can maintain their structures and obtain better results precisely because they have the human and material resources to ensure quality education under these conditions.

The demographic structures of those countries also works in their favour: the aging of the population means that the same absolute amount of investment will result in an increasingly larger amount of resources per student.

But we, with the resources at our disposal, are obliged to seek/define/devise other types of organization. That means adopting a different logical approach from our present one, which consists of proposing a solution first and analysing its economic feasibility afterwards, if at all.

We should do things the other way around and regard the national budget as our point of departure, devising our model on that basis.

We must also bear in mind that the question of funding and other resources for education is not exclusively, or always, the responsibility of economists. In Argentina, since the 1991 conversion plan, there has been a significantly larger margin for manoeuvre in public sector financing, which has also affected the education sector.

But the opportunity was missed. Instead of allocating resources more appropriately, the increase in funds was used for other purposes, including an unnecessary increase in

the number of public service posts. This has led to a sort of 'self-fulfilling prophecy' in the sector: more changes and reforms are likely to be introduced in response to fiscal restrictions—making them look like adjustments to a financial situation—than when more resources are available.

A new approach would involve addressing subjects that are currently taboo and having another look at the responses made to financial situations. For example, teachers' salaries have to be reconsidered, as does the standard class size.

## Teachers' salaries

An important aspect of any new model is the question of salaries for teachers. There is general agreement that teaching has to be professionalized and that means raising teachers' pay in consequence.

Education in Latin America has been constantly expanding over the past fifty years, and this has invariably meant a decrease in teachers' salaries. The overall result has been a slump in the quality of education: despite increased spending on palliatives (psychoeducational counselling centres, a longer school day, use of special education teachers), the desired results have not been attained. Nor were attempts to replace teachers by 'teaching packages' (on the assumption that the quality of learning depends on the quality of teaching materials) conspicuously successful.

One must wonder what economic sense it makes in the long term to use teachers' salaries as adjustment variables, especially if at the same time they are given longer leave time, more days off, fewer days of class teaching, with less demands made, all of which clearly reduce children's opportunities for learning.

The answers are being found. But it might perhaps be more rational to organize expenditures in another way, by demanding better results and, in return, offering a salary that would make teaching a professional activity.

## Pupil/teacher ratios

As part of the effort to overcome educational taboos, any consideration of a new model of education should include the question of the number of pupils per teacher since we know how significantly costs can be lowered by changes in the pupil/teacher ratio. At present, while there may be between twenty-five and thirty-five pupils in a classroom, the number of people occupying posts without classroom responsibilities (directors, educational psychologists, assistants) has, as a general rule, brought the overall pupil/teacher ratio to less than twenty students per teacher in basic education, and to less than ten at the secondary level.

A brief review of society's attempts to handle the question of education demonstrates that the pupil/teacher ratio has varied greatly throughout history. A short historical survey contained in *The unschooled mind*, by Howard Gardner, reminds us, for example, how widely the teacher/student ratio has varied over the centuries.

'For a time, in more primitive and simpler societies, education was generally provided within the household.' Thus, each child had several teachers, and there was no

specific infrastructure. Later, 'as society became more complex and valuable skills began to be highly intricate it was no longer possible for children to learn them simply by "picking them up". Those circumstances led in many societies to the institution of apprenticeships'. Under this model, the pupil/teacher ratio dropped practically to one to one. The infrastructure was not set up specifically for the teaching-learning process. Finally, 'young people—at least some of them—needed to learn to read and write, and that is how schools were established'. Under this organizational structure there are several pupils to one teacher and a specific physical infrastructure is needed.

This organizational model, which obviously resulted in a geometric increase in educational productivity, was widely developed as these skills became essential not only to young people belonging to a particular social group but to all members of society. There is no reason to believe, however, that our current model represents the only possible method of achieving this purpose.

Thinking along lines that have rarely been investigated in this area may perhaps open up new horizons and lead to new alternatives which are feasible, relevant and appropriate to today's world.

## Notes

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2. For example, in Argentina 47% of primary schools have less than fifty students and there is one administrator for every nine teachers.
3. Including teachers' salaries (whatever their value), the square footage of the school building, recurrent expenses, and materials such as textbooks, chalk and other equipment.

## References

- Argentina. Ministry of Culture and Education. Division of Educational Programming and Evaluation. 1995. *Estudio de costos en educación* [Educational costs study]. Buenos Aires.
- Coraggio, J.L. 1995. *Las propuestas del Banco Mundial para la educación: ¿sentido oculto o problemas de concepción?* [The World Bank's proposals for education: a hidden meaning or conceptual problems?]. Mimeo. (Paper presented at the seminar on World Bank educational policies in Brazil organized by Acao Educativa, São Paulo, 28–30 June 1995.)
- Downes, A.S. 1993. The impact of structural adjustment policies on the educational system in the Caribbean. *La educación, revista interamericana de desarrollo educativo* (Washington, DC), no. 116.
- ECLAC-UNESCO. 1992. Education and knowledge: basic pillars of changing production patterns with social equity. Santiago.
- Gallart, M.A. 1988. *La escuela técnica: lógica pedagógica vs. lógica empresarial* [Technical schools: educational thinking versus business thinking]. Buenos Aires. Mimeo.
- Gardner, H. 1993. *The unschooled mind*. London, Fontana Press.
- Prawda, J. 1992. *Educational decentralization in Latin America. Lessons learned*. Washington, DC, World Bank.
- Rama, G. 1987. Educación y sociedad en América Latina [Education and society in Latin America].

- La educación, revista interamericana de desarrollo educativo* (Washington, DC), vol. 31, no. 101.
- Schiefelbein, E. 1989. Repetición: la última barrera para universalizar la educación primaria de América Latina [School repeaters: the last barrier to universal primary education in Latin America]. *Newsletter on the Major Project in Latin America* (Santiago), no. 18.
- Torres, R.M. 1995. *¿Mejorar la calidad de la educación? Las estrategias del Banco Mundial* [Improving the quality of education: World Bank strategies]. (Instituto Fronesis, paper no. 17, mimeo, preliminary draft.)
- World Bank. Education and Social Policy Division. May 1995. *Priorities and strategies in education: a review*. Washington, DC, World Bank. (World Bank sectoral study.)

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# **PROFILES OF FAMOUS EDUCATORS**

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# JOSEPH CALASANZ

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(1557-1648)

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*Josep Domènech i Mira*

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## **An educational giant**

The year 1997 will mark the four-hundredth anniversary of free public primary education in modern Europe. It was four centuries ago that the great Spanish educator, Joseph Calasanz, founded the Pious schools, the first step on the long and difficult road to universal, free education. His philosophy and his life's work were highly innovative and left their mark on this and many other aspects of education. In the seventeenth century, he was matched in stature only by Comenius, and a number of parallels can be drawn between the two educators. Each belonged to a separate and antagonistic camp in a Europe convulsed by the Thirty Years War: Comenius was the educator of Protestant Europe and Calasanz the educator of Catholic Europe. Both men were born in the sixteenth century, Calasanz in 1557 and Comenius in 1592. The difference in age was considerable, but the Spanish educator lived until the age of 91 and so was a contemporary of the Czech during the first half of the seventeenth century. In Moravia, Comenius' homeland, and in other European countries, the influence of the two great teachers overlapped. Both promoted universal education and the use of national languages in schools. Both were responsible for significant innovations in teaching methods and educational structure. Although they held different positions, both men were profoundly religious. One was the founder of a Catholic congregation, the other was a Protestant bishop. Despite these commitments,

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the two men were the most important educators in the seventeenth century. They were also among the most significant figures in the entire history of education.

History, both in his own country, where he has always been held in high esteem, and in the international community, has always recognized the merits of Comenius. It has not, however, been equally generous to Calasanz. While he has enjoyed great prestige at various times in Spain, Italy and central Europe, the scant attention paid to Calasanz in many histories of education reflects his exclusion from the international pantheon.

This historical injustice has three basic causes. First, over-idealization by Calasanz's biographers and followers appears to have produced a backlash. Secondly, too much emphasis has been placed on Calasanz's religious life, overshadowing his strictly educational achievements. Thirdly, the fact that Calasanz left very few documents in which he gave a systematic account of his educational theory has made it difficult to appreciate and understand the significance of his contribution.

The key to Calasanz's thinking can be found in his letters—more than 10,000 of them—and in his texts on the founding, organization and operation of his schools and his congregation. These documents, all of which have been published, give us a clearer and more detailed appreciation of his accomplishments in the field of education.

## Biography

Joseph Calasanz was born in 1557 in the Catalan-speaking Spanish town of Peralta de la Sal, located in Aragon, near to Catalonia. He was the seventh and last son of a family belonging to the lower ranks of the Aragon nobility, the *infanzónes*,<sup>1</sup> and his father, who ran a foundry, was made mayor of Peralta. After completing his primary studies in his home town, the 11-year-old Calasanz went to Estadilla to study the humanities. In 1571 he moved to the nearby city of Lérida, home of the most celebrated university of the ancient kingdom of Aragon, drawing students from Catalonia, Aragon and Valencia, the three major communities of Aragon. As was customary in the medieval era, the students were divided into 'nations' and Calasanz was elected prior of the Aragonese. This was the first recognition of his natural authority and moral stature.

At the university of Lérida, Calasanz studied philosophy and law. He went on to study theology at the University of Valencia and at the University of Alcalá de Henares, and again in Lérida, finally obtaining his doctoral degree. He was ordained as a priest in 1583 and during his ecclesiastical career held various offices in the Catalan region. During that period, Calasanz spent several years in La Seu d'Urgell, a dangerous town close to the border with France. In those days bandits were a serious problem in Catalonia, and conditions were most extreme in the frontier regions: bands of Gascons and Huguenots, involved in the turbulence in neighbouring France, were constantly crossing the border into Catalonia where they ran riot, committing all kinds of outrages and crimes.

It was Calasanz's lot to live in those threatening and insecure times, and the situation was worse in La Seu d'Urgell than elsewhere because the diocese had been without a bishop for some time. The absence of strong authority, which in that epoch was exercised by the bishops, simply encouraged criminality. As secretary of the Cathedral Chapter, Calasanz had broad administrative responsibilities, as may be seen from the ten letters



he sent to the viceroy of Catalonia in which he urgently requested help to deal with the dire situation in the region, where murder, pillage and extortion were rife.<sup>2</sup>

Calasanaz's ties to Lérida were strengthened by other posts he held in the region, including that of inspector of Tremp, a town where a convent of Dominican monks offered instruction in reading and writing. In those days Calasanaz was a young man whose tall and powerful physique reflected the tremendous moral, intellectual and spiritual force that was to remain with him throughout his life. The tenacity with which he dedicated himself to his educational mission spoke of a Herculean strength—larger than life—that only a man of extraordinary abilities could sustain.

In his early years in Spain, Calasanaz had already shown his concern for the poor and disadvantaged by establishing in Claverol a foundation that distributed food to the destitute each year. The charity remained in existence for nearly two-and-a-half centuries, until 1883. In that revealing initiative taken in his youth, the great social concern that Calasanaz would later demonstrate in his educational work was already clear for all to see.

In 1592, at the age of 35, the future educator moved to Rome in the hope of furthering his ecclesiastical career. He lived there for most of his remaining fifty-six years. He became, during this long period, a fully fledged Roman with strong ties to both Rome and Italy, without ever losing touch with his Spanish roots.

Disturbed by the moral and physical degradation of large numbers of Roman children, Calasanaz established in 1597 at the Church of Santa Dorotea of Trastévere the first Pious School, which was the first free public school in modern Europe.

In 1600 a Pious School opened in the centre of Rome and soon there were extensions in response to growing demands for enrolment from students who flocked from all over. In 1610 Calasanaz wrote the *Documentum princeps* in which he set out the fundamental principles of his educational philosophy. The text was accompanied by regulations for teachers and for students. In 1612, the school moved to San Pantaleón which became the parent house of all the Pious schools.

The first Pious school outside of Rome was established in Frascati in 1616. One year later, Pope Paul V created the Order of the Pious Schools, the first religious congregation dedicated essentially to teaching. During the following years Pious schools were established in various parts of Italy, including Genoa (1625) and Naples (1626). During that period Calasanaz drafted the constitutions for the Nazareno College of Rome and was in contact with Galileo. In 1631, he founded the Mikulov College in Moravia where, soon afterwards, he also established the Strážnice and Leipnik colleges. Schools were set up in many other cities in Italy. Because of his earlier ties to the Lérida region in Spain, Calasanaz tried in 1638 to establish his first Spanish school in Guissona, but the outbreak of war two years later prevented the completion of the project.<sup>3</sup> In 1642, the Royal College of Warsaw and the Podoliniec College were established in Poland, triggering off a great expansion of Pious schools in Poland.

In that same year, as a result of an internal crisis in the congregation and outside intrigues and pressures, Calasanaz was briefly held and interrogated by the Inquisition. The following year, the elderly educator, drawn into a power struggle fuelled by political interests and personal ambitions, was discredited and removed from his post as general of the religious order that he had founded, to be replaced by one of his detractors. In the fol-

lowing years, Calasanz continued to live in disgrace, his religious order was demoted and the whole system built up over the years was in danger of collapse. In 1648, still in disgrace, Calasanz died at the age of 91 and was buried in San Pantaleón. Eight years after Calasanz's death, Pope Alexander VII cleared the name of the Pious schools. Joseph Calasanz was beatified by the Catholic Church in 1748 and canonized nineteen years later. On 13 August 1948, Pope Pious XII declared him patron of all Christian public schools. Today, there are Pious schools in Europe, Africa, the Americas and Asia.

## **Birth of a vocation**

Arriving in Rome at the end of the sixteenth century, Calasanz discovered a city with serious economic, health and moral problems. For an entire century, urban development had been hindered by various factors: the sacking of Rome in 1527; intermittent epidemics of the plague; and frequent and dangerous bursting of its banks by the River Tiber. As in other European cities of the time, much of the population of Rome was more or less destitute. One social observer commented in 1601: 'In Rome, one sees nothing but beggars and there are so many of them that one cannot stand or walk in the streets without being continually surrounded by them'.<sup>4</sup>

Other religious communities of the time were concerned about this situation and made noble efforts to provide charity to sick and orphaned children. In addition, the city had been markedly influenced by the Council of Trent, which had decreed that the catechism was to be taught to all citizens and especially to the younger generation. It was this combination of urban poverty with a desire for religious and moral renewal that formed the background against which Calasanz got to know the city's fourteen districts. As a member of various confraternities, and especially as the Visitor of one of them, he was thoroughly familiar with the extreme poverty and social and moral degradation existing in certain districts.

The deplorable situation in which many children lived opened Calasanz's eyes to the extraordinary importance of education as a means of promoting social and moral development and of bringing about change. In Rome, an educational vocation was thus awakened that was in complete harmony with his religious mission and to which he would remain faithful throughout his life.

Rome in Calasanz's time had some small single-teacher schools enrolling about thirty pupils, run by local teachers.<sup>5</sup> While those schools were open to poor children, only a small number attended because there were very few teachers—only thirteen for the entire city—and their wages were so low that they were unable to offer education to the many poor children in Rome free of charge. There were also prestigious educational establishments teaching the humanities, such as the Roman College run by the Jesuits. But that school only accepted pupils who had already completed their basic studies, thus excluding large sectors of the working class who had never learned to read.

Furthermore, throughout Europe the systems of teaching inherited from the Middle Ages had been transformed by the humanist values of the Renaissance. Much greater emphasis was placed on classical studies, giving rise to an increasingly élitist education system.

Calasanz's many visits to the poor neighbourhoods of Rome made him aware not only of the social situation of the many poor families living there, with their problems of food, hygiene, health and morality, but also of the fact that the talents of some of the children and adolescents in this situation were being wasted. This discovery distressed him greatly and was for him a severe but salutary shock: 'Highly talented youngsters who might give great service to the State remain in the gloom of ignorance for want of instruction, both in literature and morals'.<sup>6</sup>

It was at that moment that the university doctorate who had been hoping to further his ecclesiastical career discovered a vocation for teaching. It was this new interest that really enabled Calasanz to accomplish his priestly vocation. The two approaches were by no means incompatible; in fact, they were mutually supportive and were to be closely linked throughout his life. Calasanz was a priest who found in teaching the most genuine and personal means of expressing his religious aspirations.

During his visits to the poorer quarters of Rome, Calasanz had discovered a small parish school in the Church of Santa Dorotea del Trastévere which, like other schools, accepted only fee-paying students. In 1597, he converted it into a school offering education free of charge to the children of the poor. The establishment of the first Pious school marked the start of Calasanz's prodigious educational career.

Just as Calasanz was discovering his powerful calling for teaching, he was offered a post as canon in the cathedral of Seville. Whereas before, this offer would have been the fulfilment of all his hopes, now it was too late. He had found his true path: 'In Rome I discovered the best way to serve God—by helping these poor children. Nothing in the world could bring me to change my course'.<sup>7</sup>

## Educational work

Several aspects of Calasanz's work as an educator are particularly noteworthy. First, as recognized by such students of his work as Ludovico Von Pastor,<sup>8</sup> Georgy Santha<sup>9</sup> and Severino Giner,<sup>10</sup> Calasanz was the founder of the first free public school in modern Europe. From its foundation four centuries ago, this type of school has continued to exist until the present day. It was a revolutionary initiative, a radical break with the class privileges that kept the masses marginalized and in poverty. In the history of education, Joseph Calasanz is the great educator of the poor, offering education free of charge to all classes of society, without discrimination. He remained dedicated to those principles throughout his life. There are many examples of the constant vigilance he exercised over his schools in that regard: 'Pupils shall under no circumstances be required to pay for equipment, school desks or other items.'<sup>11</sup> 'Teachers are instructed not to request anything of the students.'<sup>12</sup> 'I must advise you that a serious error and negligence has been observed in the schools: buying and selling.'<sup>13</sup>

Secondly, in his strict application of Christian principles, Calasanz also taught that discrimination, whether based on social class, race or religion, was wrong. He displayed the same moral courage, as will be seen later, in his attitude to victims of the Inquisition, such as Galileo and Campanella, and in the acceptance of Jewish children in his schools, where they were treated with the same respect as other pupils. For those times,

this was outstanding.<sup>14</sup> Similarly, Protestant pupils were enrolled in his schools in Germany.<sup>15</sup> So great and universal was Calasanz's prestige that he was even asked by the Turkish Empire to set up schools there, a request which he could not, to his regret, fulfil, due to a lack of teachers. The sole merits recognized in Calasanz's schools were those of study and virtue.

Thirdly, Calasanz founded, organized and systematized a method of educating primary school pupils through progressive levels or cycles; a system of vocational training; and a system of public secondary education. There could be as many as 1,500 students in one of his schools, making them very different from the other local schools in Rome and elsewhere, which usually had only one teacher. Because of their size, his schools required very detailed and comprehensive organization, and the system of levels and cycles of education played a very important role. In that regard Bau has pointed out: 'The Pious Schools, in particular San Pantaleón in Rome, were at once primary schools, middle schools that trained pupils without career aspirations in the mathematical and writing skills needed for work in offices and shops, and high schools that offered studies in Latin and the humanities'.<sup>16</sup>

## **School organization**

Although classes were sometimes provided for the very young, children usually began school at the age of 6, moving through a succession of nine grades in descending order. Thus, in the ninth grade, children were taught in groups to recognize syllables presented to them on large charts. Reading skills were perfected in the eighth grade: the children read out loud individually to the teacher and corrected each other. Classes were held for two-and-a-half hours mornings and afternoons. A general examination was conducted every four months in all the schools. Students who passed the examination were promoted to the next grade.

Calasanz recommended a maximum of fifty pupils in each class. Nevertheless, class size sometimes reached sixty. To encourage competition, the students were divided into two groups which competed with each other for the best grades.

In an era when no one else was interested in public education, Calasanz managed to set up schools with a highly complex structure. For instance, for the school year 1623/24, the school of San Pantaleón had a staff of thirty-seven, including teachers, supervisors, administrative personnel, nurses and cooks.

Calasanz was concerned with physical education and hygiene. He addressed the subject in various documents and requested school directors to monitor children's health. He made every effort to ensure that the water used in his schools was pure and made sure that the classrooms were whitewashed every year. He insisted on the highest standards of cleanliness in all the auxiliary buildings and especially the washrooms. In many ways, Calasanz anticipated our own times, since he also established complementary facilities including dining halls, cloakrooms and dormitories. He saw to it that the students were provided with the necessary materials free of charge, including paper and ink.

Teachers had to keep three registers: enrolments, attendance and marks. They were required to prepare their lessons in advance and be at their posts before the students arrived.

They accompanied the students to their homes after class. Calasanz himself carried out this task until he reached the age of 85.

## Course content

Students were taught to read both in Latin and in the vernacular. While maintaining the study of Latin, Calasanz was a strong defender of vernacular languages, and had textbooks, including those used for teaching Latin, written in the vernacular. In that respect he was more advanced than his contemporaries. Comenius, for example, was considered a great advocate of vernacular languages, but wrote his own books in Latin.

By the sixth grade, pupils were already proficient at reading. In the fifth grade, they were divided into two groups: those who planned to take up a trade studied mathematics, while those who planned to pursue their studies in the humanities learned grammar. Students in both groups took classes together in writing, where penmanship was stressed.

Calasanz placed great emphasis on the teaching of mathematics. Here, as in many other matters, he was a major innovator who foresaw future trends. Training in mathematics and science was considered very important in the Pious schools, both for pupils and teachers. The educator's preoccupation with this subject occurs constantly in his writing: 'You must perfect yourself as much as possible in mathematics, a very useful subject' (letter to Morelli dated 31 March 1635).<sup>17</sup> 'With regard to the arithmetic division, if anyone demonstrates an aptitude for that subject, encourage him on my behalf and be yourself the first to learn the material' (letter to Bianchi dated 20 July 1634).<sup>18</sup>

The Pious schools never ceased to emphasize the importance of mathematics and science, and references to those subjects can be traced over the centuries. In Spain, for example, a country without a strong scientific tradition, the education provided by the Pious schools in the fields of mathematics and science was very highly regarded. Mariano Cardedera, a Spanish educator of the mid-nineteenth century, noted: 'Under the guidance of the Piarists, the boarding-school students study mathematics, physics, chemistry and natural history [. . .] In the daytime, the students assiduously study the exact and natural sciences.'<sup>19</sup>

The great interest taken by Calasanz in those subjects contrasted with the general lack of concern for them during that period in Europe.

Primary school ended with the fifth grade. In the next four grades, the students completed a humanities curriculum that, in Rome, included studies at the Jesuits' Roman College.

But Calasanz's main concern was undoubtedly the moral and Christian education of his students. As both priest and educator, he considered education to be the best way of changing society. All his writing is imbued with his Christian ideals, and the constitutions and regulations of the Pious schools were based on the same spirit. Calasanz created an ideal image of a Christian teacher and used it to train the more than 500 teachers who worked with him during his lifetime.

## Discipline

Calasanz was the first educator to advocate the preventive method: it is better to anticipate mischievous behaviour than to punish it. This method was later developed by St John Bosco, the founder of the Salesian Schools. In terms of discipline, and contrary to the prevailing philosophy of his own and subsequent eras, Calasanz favoured the mildest punishment possible. While believing that punishment was necessary in certain cases, he always preached moderation, love and kindness as the basis of any discipline. 'We must punish with great compassion for that is part of our name and the charity in which we believe' (20 June 1624).<sup>20</sup> 'I wish to remind you that punishment should be used with discretion. The children should be treated with great kindness' (18 December 1626).<sup>21</sup> 'In punishing the children, be kind rather than severe' (10 October 1643).<sup>22</sup>

Discipline had to be based on firmness and kindness, its main aim being to prevent bad behaviour. If instances of bad behaviour occurred, the main concern should be to avoid a thoughtless reaction and, when the time came to take action, to impose discipline in a way that ensured that the pupil's behaviour would improve.

## Calasanz and Galileo

Knowledge of Calasanz's relationship with one of his great scientific contemporaries, Galileo Galilei (1564–1642) is essential for a proper appreciation of his personality. They were of roughly the same age and both had to live through very trying situations.

These two great men of education and science knew each other, met each other and had a great respect for each other. In fact, they had much in common. First, both advocated the teaching of mathematics and science, which, although it was to be expected of a man of science, was less usual in educators of that period. Analysis of Calasanz's educational work reveals a constant and most unusual interest in the teaching of mathematics. At a time when humanistic studies ruled the roost, Calasanz, without neglecting the humanities, sensed the importance of mathematics and science for the future and issued frequent instructions that mathematics and science should be taught in his schools, and that his teachers should have a firm grounding in those subjects.

With regard to Galileo and mathematics, it should be recalled that some distinguished Piarists were fervent disciples of the great scientist and shared and defended his controversial, indeed revolutionary, view of the cosmos. The Galilean model of the cosmos, which was based on the thinking of Copernicus and Kepler, called into question the Ptolemaic model which had been accepted throughout the Middle Ages. It attracted the interest of the Inquisition, which tried him, condemned him and forced him to retract his theory.

When Galileo subsequently fell into disgrace, Calasanz instructed the members of his congregation to provide him with whatever assistance he needed and authorized the Piarists to continue studying mathematics and science with him. Their dignified and courageous support for Galileo does both Calasanz and the Piarists great credit, bearing witness to the tolerance of a great educationist.

Unfortunately, those opposed to Calasanz and his work used the support and assis-

tance offered by the Piarists to Galileo as an excuse to attack them. The Piarist Francesco Michellini, who was to succeed Galileo in the chair of mathematics, was denounced before the Inquisitor of Florence in these terms:

Professor Francesco Michellini of the Pious schools believes and teaches publicly the doctrine that all things are composed of atoms and not of matter and form, as Aristotle and others have stated. He maintains also that the earth moves and that the sun is fixed, being so convinced of the truth of this doctrine and others of Mr Galileo that he rejects all other theories as false and invalid. He calls himself an opponent of Aristotle, whom he considers an ignoramus, regarding Mr Galileo as an oracle, lauding and extolling him as the wisest of men and attributing all kinds of other honours and distinctions to him.<sup>23</sup>

Despite such attacks, the Piarists continued to support Galileo and remained his fervent disciples. Calasanz had a great admiration for Galileo and held him in high regard: when, in 1637, the great man of science, already elderly, lost his sight completely, Calasanz ordered the Piarist Clemente Settimi to serve as his secretary. Calasanz's instructions to the rector of the College of Florence were clear: '... and if Mr Galileo should ever request that Professor Clemente Settimi remain with him overnight, please allow him to do so, and, God willing, he will use the opportunity as he should.'<sup>24</sup>

In Florence the Piarists had been placed in charge of a prestigious Advanced School of Mathematics, which played an important role in training the Pious school teachers. Piarists who had been students of Galileo were also appointed heads of major mathematics teaching institutions in Rome, Genoa, Naples and Podoliniec (Poland). Many of the teachers and students in those schools became outstanding scientists.

## Campanella's apology

Calasanz brought the same understanding and sympathy he had shown to Galileo to his friendship with the great philosopher Tommaso Campanella (1558—1639). Campanella was one of the most profound and fertile minds of his time, producing philosophical works such as *Metafisica* [Metaphysics], Utopian works such as *La città del sole* [The city of the Sun], and political works such as *La monarchia di Spagna* [The Spanish monarchy].

Campanella was also tried several times by the Inquisition and was incarcerated in Naples for more than twenty years. He was a friend of Galileo, with whom he kept up a prolific correspondence, and defended him against the attacks of his enemies in a tract entitled *Apologia pro Galileo* [Apology for Galileo]. Despite the fact that he was a highly controversial figure in his time, Campanella too maintained a strong and fruitful friendship with Calasanz. The philosopher whose Utopian visions proposed social reforms in which the education of the masses played an important part must have been a kindred spirit for Calasanz, who was already putting these Utopian ideas into practice in his work. The theorist and the empiricist, the thinker and the doer, shared the same educational objectives.

Calasanz, with his customary courage and open-mindedness, invited the contro-

versial thinker to Frascati to help teach philosophy to his teachers. Although brief, the collaboration must have had some impact.

It is not surprising, then, that Campanella, who had rallied to the support of Galileo, also came to the defence of his friend Calasanz. The Pious schools were up against powerful enemies and detractors and, for half a century, Calasanz was subjected to severe internal and external pressures which in the end resulted in a brief period of imprisonment by the Inquisition and, later on, in his destitution as leader of the congregation he had founded. The order itself was demoted and seemed in danger of disappearing completely. The Pious schools needed constant assistance and support in order to survive and the *Liber apologeticus* [The apology] written by Campanella in their defence was a very significant response to that need. In this work, the philosopher drew attention to the innovative and advanced nature of the work done by Calasanz and systematically refuted all the accusations levelled against the Pious schools. To those who cited Aristotelian doctrine in support of keeping the people in ignorance and attacked Calasanz for teaching science to the poor, on the grounds that this would disturb the peace of the republic, he replied:

Science is the perfection of the soul and of the human race. Therefore, the more widely science is disseminated, the more minds it will improve and harmonize. Aristotle himself, in Book Five of his *Politica*, writes that those who wish to keep the people ignorant so that they can do evil with impunity and without being criticized are tyrants. Depravity in the workers is due to ignorance.<sup>25</sup>

The Apology consisted of a preface and two chapters, the first for the lay readership and the second for the religious community. Both chapters set out the accusations against the Pious schools and the corresponding refutations. The book was an enthusiastic defence of the work of Calasanz.

## International influence

Any attempt to accord the Pious schools their rightful place in the history of education would be incomplete without reference to the expansion of the system in countries around the world.

But most important of all is the influence—direct and indirect—of Calasanz's work and thought, which led to the subsequent establishment of many other congregations similar to his own. There are eleven religious teaching orders now in existence that were based on Calasanz's ideas. These are, in a sense, branches growing directly from the trunk formed by Calasanz's educational work. Also worthy of mention is the direct influence that Calasanz had on other great educators, such as St Jean-Baptiste de la Salle in the eighteenth century, and St John Bosco, his great admirer, in the nineteenth century. In addition to his influence on similar institutions that were set up after his time, Calasanz's schools served as the model for State public school systems in some European countries.

The Pious schools, with their thousands of students, have educated some of the most important figures of this century, including a number of Nobel Prize winners. In Spain, four Nobel Prize winners—Cajal, Benavente, Aleixandre and Cela—were educated in Pious schools. This is the heritage that the great educator has left to his native country.



## An educational commemoration

On the occasion of the four hundredth anniversary of the foundation of the first Pious School, it is historical justice to remind ourselves of the life and work of its founder. The seed that he planted at Santa Dorotea del Trastévere 400 years ago has grown and borne fruit, producing seeds that have been scattered throughout the world. Today there are Pious Schools in twenty-six countries on four continents and the doctrine of free and universal education advocated by those schools is accepted as the basis of nearly every education system. The Pious schools have served as a model for many other religious teaching orders which, whether directly or indirectly, have drawn inspiration from the work of Calasanz. With its centuries of experience, its geographical coverage and influence, the educational mission launched by Calasanz is one of the most vital and productive the world has seen. Many of the innovations he brought to teaching and school organization are still valid today.

Calasanz had great breadth of vision and the ability to see far ahead in time. He had a very accurate sense of the social and scientific developments of the future and acted accordingly. While other educators and thinkers spent their time describing Utopias that were unattainable in practice, Calasanz had the courage, energy and skill to realize his own Utopia. His pedagogical achievement is comparable to that of Comenius, the other great educator of that century. But, while Comenius' strong point was theory, Calasanz's achievements were practical achievements. He was, above all, the educator in action.

It thus seems a pity that, although histories of education recognize the contribution of Comenius, Calasanz's importance continues to be overlooked in modern studies of education. It is to be hoped that this commemorative text will go some way to rectifying this injustice.

### Notes

1. S. Giner, *San José de Calasanz, Maestro y fundador* [St Joseph Calasanz, teacher and founder], Madrid, Biblioteca de autores cristianos, 1992, p. 40.
2. C. Bau, *San José de Calasanz* [St Joseph Calasanz], Salamanca, Publicaciones de Revista Calasancia, 1967, p. 47.
3. *Ibid.*, p. 254.
4. Quoted in G. Santha, *San José de Calasanz : su obra y escritos* [St Joseph Calasanz: his work and writings], Madrid, Biblioteca de autores cristianos, 1956, p. 30.
5. Santha, *op. cit.*, p. 36.
6. *Ibid.*, p. 57.
7. Quoted in Giner, *op. cit.*, p. 417.
8. Giner, *op. cit.*, p. 659.
9. Santha, *op. cit.*, p. 55.
10. Giner, *op. cit.*, p. 160.
11. Lodogario Picanyol, *Epistolario de San Giuseppe Calasanzio* [Collected letters of Saint Joseph Calasanz], vol. VI, p. 252, letter 2,738, Rome, Editiones Calasancianae, 1954.
12. *Ibid.*, vol. VII, p. 95, letter 3,118.
13. *Ibid.*, vol. VII, p. 157, letter 3,208.

14. Giner, op. cit., p. 595.
15. Ibid.
16. Bau, op. cit., p. 165.
17. Picanyol, op. cit., vol. VI, p. 15, letter 2,358.
18. Ibid., vol. VII, p. 397, letter 3,672.
19. M. Carderera, *Diccionario de educación y métodos de enseñanza* [Dictionary of education and teaching methods], p. 285, Madrid, Imprenta A. Vicente, 1855.
20. Picanyol, op. cit., vol. II, p. 238, letter 224.
21. Ibid., vol. III, p. 68, letter 566.
22. Ibid., vol. VIII, p. 211, letter 4,138.
23. Quoted in Bau, op. cit., p. 298.
24. Picanyol, op. cit., vol. VII, p. 65, letter 3,074. The original text in Italian is as follows: 'Et se per caso il Sig. Galileo dimandase, che qualche notte restasse lá il P. Clemente, V.R. glielo permetta e Dio voglia, che en sappia cavare il profitto che doveria.'
25. Tomas Campanella, *Apología de las Escuelas Pías* [Apology for the Pious Schools], quoted in: Santha, op. cit., p. 726.

## References

- Asiáin, M.A. *El año con Calasanz* [The year with Calasanz]. Salamanca, I.C.C.E., 1991. 751 p. [An annotated selection of approximately 1,500 brief texts by Calasanz.]
- Bau, C. *San José de Calasanz*. Salamanca, Publicaciones de Revista Calasancia, 1967. 419 p.
- Campanella, T. Libro apologético contra los impugnadores de las Escuelas Pías [An apology against opponents of the Pious Schools]. In: Santha, G., ed. *San José de Calasanz*, Madrid, Biblioteca de autores cristianos, 1956.
- Canata, A. *Educador católico* [The Catholic educator]. Barcelona, Ediciones Gala Calasancia, 1943. 377 p.
- Cueva, D. *Calasanz mensaje espiritual y pedagógico* [Calasanz: a spiritual and educational message]. Madrid, Publicaciones I.C.C.E., 1973. 380 p. [A selection of Calasanz's thoughts grouped under subject headings.]
- . Congregaciones afines [Related congregations]. In: Giner, S., et al., eds. *Escuelas Pías: ser e historia*. Salamanca, Ediciones calasancias, 1978.
- Flaubel Zapata, V. *Antología Pedagógica Calasancia* [Calasanz's educational works: an anthology]. Salamanca, Publicaciones de la Universidad Pontificia, 1988. 180 p. [A selection of educational documents and texts by Calasanz grouped under subject headings.]
- . Escolapios memorables por su santidad. Escolapios peritos en ciencias eclesiásticas. De las ciencias al arte de educar. Ex alumnos célebres de las Escuelas Pías [Saintly Piarists. Piarists learned in ecclesiastical sciences. From the sciences to the art of education. Famous former students of the Pious Schools]. In: Giner, S., et al., eds. *Escuelas Pías: ser e historia*. Salamanca, Ediciones calasancias, 1978. 410 p.
- Giner, S., et al., eds. *Escuelas Pías: ser e historia* [The Pious schools: present and past]. Salamanca, Ediciones calasancias, 1978. 410 p.
- Giner Guerri, S. *San José de Calasanz: maestro y fundador* [Saint Joseph Calasanz: teacher and founder]. Madrid, Biblioteca de autores cristianos, 1992. 1,122 p.
- . *San José de Calasanz* [Saint Joseph Calasanz]. Madrid, biblioteca de autores cristianos, 1985. 271 p.
- . La vocación escolapia. Síntesis cronológicas, estadísticas y mapas históricos. Bibliografía y

- biógrafos de San José de Calasanz. Obispos escolapios [The Piarist vocation. Chronologies, statistics and historical maps. Bibliography and biographies of Saint Joseph Calasanz. Piarist bishops]. In: Giner, S., et al., eds., op. cit.
- Lesaga, J.M.; Asiaín, M.A.; Lecea, J.M. *Documentos fundacionales de las Escuelas Pías* [Basic documents of the Piarist Schools]. Salamanca, Ediciones calasancias, 1979. 306 p. [Contains eight very important documents relating to the institutions established, including the constitutions and petitions written by Calasanz to Cardinal Tonti and Cardinal Roma.]
- López, S. *Documentos de San José de Calasanz* [Documents of Saint Joseph Calasanz]. Bogotá. Editorial calasancia latinoamericana, 1988. 416 p. [An annotated collection of 107 documents by Saint Joseph Calasanz, crucial for any study of the work and philosophy of the great educator.]
- Picanyol, L. *Epistolario di San Giuseppe Calasanzio* [Collected letters of Saint Joseph Calasanz]. Rome, Editorial Calasantiannae, 1950. 9 vols. [Contains 5,000 letters from Calasanz with commentaries. An essential work for any study of the educator's philosophy and work.]
- Poch, J. *Un documento inédito de los orígenes de las Escuelas Pías en España* [An unpublished text on the origins of the Pious schools in Spain]. Madrid, Analeta Calasantiana, 1959.
- . *El fundador de las Escuelas Pías en la historia eclesiástica de la Corona de Aragón* [The founder of the Pious schools in the ecclesiastical history of the Kingdom of Aragón]. Madrid, Analeta Calasantiana, 1968.
- Santha, G. *San José de Calasanz : su obra. Escritos* [Saint Joseph Calasanz: his work and writings]. Madrid, Biblioteca de autores cristianos, 1956. 827 p. [The text includes a collection of documents and letters by Calasanz.]
- . *La fidelidad a Calasanz* [Keeping faith with Calasanz]. Salamanca, Ediciones Calasancias, 1982.
- Vilá, C. *Epistolario de San Giuseppe Calasanzio* [Collected letters of Saint Joseph Calasanz], vol. X. Rome, Editiones Calasantiannae, 1988. [Continuation of the nine-volume work by Lodegario Picanyol cited above.]
- . 1978. Síntesis de la historia de la Orden de las Escuelas Pías. Descripción de las provincias de la Orden. Pedagogía calasanciana. Escuela Pía Contemporánea [Brief history of the Order of the Pious Schools. Provinces of the Order. The educational theory of Calasanz. Contemporary Piarist Schools]. In: Giner, S., et al., op. cit.

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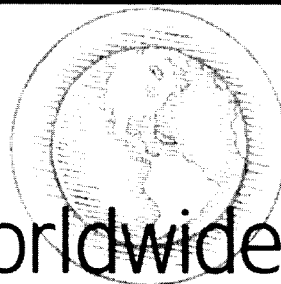
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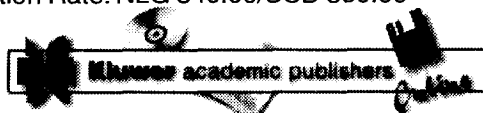
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