Senegal team

Innovation and Revitalization of Education in Sub-Saharan Africa: Educational Programmes, Pedagogy and Teaching Tools

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I. INTRODUCTION

This evaluation study focuses on educational programmes, pedagogy and teaching tools. It has adopted the International Standard Classification of Education (ISCED; UNESCO 14). For the purposes of this study, the ISCED 97 is simplified to four levels: level 0 for pre-primary education, level 1 for primary education, level 2 for secondary education and level 3 for higher education. The reason for adopting this simplified ISCED is to facilitate comparisons between education systems in Sub-Saharan Africa, as there are considerable differences in their modes of organization and functioning.

This introduction covers three important themes that are necessary to the understanding of how education systems have evolved in Africa. The first is the basic frameworks of international consultations and their assessment of education in Africa since the International Education Conference in Addis Ababa in 1961, held under the aegis of UNESCO. The second concentrates on the quality of education, while the third concerns the repercussions of globalization. The methodology of the study and the adopted plan are then presented as the last two points of the introduction.

I-1. The major international consultation frameworks

The role of education in development no longer needs to be demonstrated (World Bank, 1988). Sub-Saharan Africa has not been completely oblivious to the numerous reforms of education systems that have been undertaken (a process that is continuing), nor have its education systems been impervious to efforts made to place education at the service of human and social development. The diagnoses that have been made, from the International Education Conference in Addis Ababa in 1991 up to the World Education Forum held in Dakar in 2000, the recommended guidelines for action and their assessments form a bulky database. The leading international co-operation organizations are at the origin of this database: mainly UNESCO, the World Bank, UNICEF and UNDP. (See UNESCO, UNICEF and IBRD, 1990; Delors, 1996; UNESCO, 1999, 2000a, 2001, 2002, 2003, 2004, 2005; UNESCO/Dakar Pole, 2005a, 2006a; etc.)

I-2. Quality education

Since the World Conference on Education For All, which took place in Jomtien, Thailand (UNDP, UNESCO, UNICEF and IBRD, 1990), and the World Education Forum of Dakar (UNESCO, 2000b), the recommendations submitted during major international meetings and the accompanying research have all placed emphasis on quality. Quality is mainly the result of a combination of five factors. The first of these relates to policies on education, which in turn leads to the second factor: financing. The third factor has to do with enrolment and retention. The fourth concerns mainly content and teaching strategies, while the fifth is devoted to human and material resources.

Among these five factors, two appear to have a significant impact on the outcomes of educational action: first, contents and strategies and, second, resources. Contents and strategies are important because they reflect political orientations and put them into operation in the form of educational measures that can be effectively observed. Resources, meanwhile, form a series of relevant indicators regarding the determination to implement policy decisions. Programmes, strategies and resources are vital for education because they play a direct role in shaping people and in helping them to achieve personal fulfilment as individuals, citizens and producers. This explains, through a retroactive loop effect (Morin, 1986: 100–101), the vital role played by education in human development.

To achieve the expected results, contents and resources must imperatively meet certain criteria of quality (UNICEF, 2000; UNESCO-BREDA, 1998; World Bank; Bouchard and Plante, 2002; Barnabé, 1995; AIU, 2005, 2007; AFIDES, 2005; Sall, 1996; Sall and De Ketele, 1997; UEMOA, 2004). These criteria encompass the notion of relevance (UNESCO-BREDA, 1998). Over and above the local contexts that need to be taken into account, African education systems also should adopt international standards (Behrens, 2006). Quality and relevant contents, strategies and teaching resources are the keystones of education systems.

The overall quality of contents and strategies must be looked upon as a continuum that starts with pre-primary education and extends over a lifetime, with the possibility of considering each level of education as an entity (a self-sufficient segment). Bearing this in mind, after early childhood care and education, all leavers of the successive levels, from primary education (level 1) to higher education (level 3), should show that they have acquired the life skills required to fully develop their potential.

Viewed from this angle, every learner leaving primary or secondary school, and even after one year of higher studies, should be sufficiently equipped to be useful to the community both intellectually and morally. If this is accomplished, education will indeed prove to be at the service of training human resources. Its effects will be measured through fundamental acquisitions, these being translated as knowledge, inter-personal skills, a lifelong learning capacity and know-how. It is essential to acquire a spirit of enterprise, starting from school, given the numerous economic difficulties suffered by many countries in Sub-Saharan Africa in addition to the effects of globalization.

I-3. The repercussions of globalization on education

This view requires the elaboration of interactive educational programmes and strategies, from pre-primary level through higher education. These programmes also should be adapted to different contexts and numerous needs in order to be aligned with the fixed objectives to be accomplished. The contexts range from local to worldwide scales, from the natural environment inhabited by the learner to the most distant in space (and even time) in a world that has become a global village.

The world as a global village is characterized by an increasingly tighter interdependence between human societies. And interdependence, in turn, leads to a high mobility of people and the necessity to adapt to new situations or demonstrate skills that are in keeping with those required by the host environment. Globalization has led to an interweaving of economies and their consequent production of goods and services.

Globalization exposes education to free competition throughout the world in general, and in Africa in particular. The new rules it has set in motion impose further difficulties for African education systems, which are not always adequately prepared for them (Altbach, 2004; AIU, 2005; AAU, 2004; Bowles, 2005; Halvorsen and Michelsen, 2004; Knight 2004; Solaux and Suchaut, 2002). Countries are trying to adjust their education systems to face this pressure; in West Africa, for example, this exercise is being carried out with the support of the West African Economic and Monetary Union (UEMOA, 2004).

I-4. General methodology of the study

The study on educational programmes, strategies and teaching tools is based mainly on significant experiences observed in Sub-Saharan Africa. The educational experiences mentioned are analysed and appraised from the angle of the assessments drawn up by leading international co-operation organizations working in the area of research on education.

International assessments of education in the world in general, and in Africa in particular, draw their inspiration from the first six editions of the Education for All Global Monitoring Report (UNESCO, 2000a, 2001, 2002, 2003, 2004; UNESCO/Dakar Pole, 2005a, 2006a), the reports of UNICEF (UNICEF 2000, 2003a, 2003b), the World Bank (World Bank, 2001, 2006), and the Population Council (Lloyd and Hewett, 2003). The conclusions of these reports are, in turn, subjected to an effort towards understanding and extension, thanks to research on education.

I-5. Presentation of the findings of the study

The results of the study are presented in five parts: educational programmes (II), specific programmes (III), pedagogy and teaching methods (IV), teaching tools and technology (V), and conclusions (VI).

II. EDUCATIONAL PROGRAMMES

Section II-1 deals with the pedagogical foundations of action in the field of education, the need to move from a concept based on an approach through programmes to a concept centred on curricula. Four themes are then discussed: the needs for lifelong quality education (II-2); the question of indigenous programmes, taking into consideration the specific features of each country in Sub-Saharan Africa (II-3); the life skills required for full personal development of the individual (II-4); and the issues of the languages of instruction (II-5a) and the teaching of science and technology (II-5b).

II-1. From programmes or broad fields of education to curricula

Like the distinction made between levels of education, programmes are conceived according to the definition of the ISCED, which defines them as broad groups and fields of education (UNESCO 14). Since education is centred mainly on values, a study of educational programmes in Sub-Saharan Africa must take into account both the major political decisions taken since the Addis Ababa Conference (UNESCO 1961, UNESCO 1 to UNESCO 12) and the missions and goals of education. (See Box 1.)

The will to adapt contents and improve their efficiency has returned to the centre of preoccupations and research, especially since the International Education Conference held in Jomtien, Thailand. (See UNESCO, 17; Robinson, 2003; Crisan, 2006; Republic of Niger, 2006; Jonnaert, 2004; ADEA, 2005). From the Conference of Ministers of Education of African Member States (MINEDAF I), held in Addis-Ababa in 1961, to MINEDAF VIII (Dar-es-Salam, 2002), the issue of contents, co-operation and regional harmonization in the field of education have been among the recurring themes discussed at all Conferences of African Ministers of Education (UNESCO, 1961; UNESCO, 1 to 12).

Even though great efforts still need to be made, notable results have been recorded in the targeted fields. The most significant innovations of the programmes were introduced in the social sciences, particularly the teaching of history and literature. However, other demands have emerged at the same time as the determination to Africanize education. This applies to the basic missions of education, for instance. Education is increasingly perceived as a duty to offer individuals opportunities to learn, develop and fulfil themselves throughout their life. The Delors Report (Delors, 1996) is frequently considered to be one of the central pillars of this view. However, the need to look upon education as an action that lasts for a lifetime, in fact, goes back to the early 1980s with the Club of Rome Report (Club of Rome, 1980).

To implement these general views, research on education seems to place priority on moving away from an approach based on educational or teaching programmes in favour of curricula (see Box 1; Depover, 2006:8–11). "A curriculum is an educational plan that encompasses contents, methods, learning resources, and evaluation procedures." (Depover and Noël, 2005:11). Curricula are constructed on the values, needs, expectations and interests of individuals and communities (Demeuse and Strauven, 2006; Depover and Noël, 2005).

The revitalization of education in Sub-Saharan Africa must take four major constraints into consideration when integrating the fundamental principles of the curricula approach: the demands for lifelong quality education for all; the design of indigenous programmes in line with the local characteristics of learners; the introduction of the skills that are indispensable for the personal development of individuals in their environment; and the languages of instruction and teaching of science and technology.

II-2. Demands for lifelong quality education for all

More than ever, the world is characterized by two newly emerging phenomena: it is becoming globalized at the same time as the renewal of knowledge is accelerating. This dual characteristic has major consequences on education, both throughout the world in general and in Sub-Saharan Africa in particular. The educational programmes provided in Sub-Saharan Africa should, in fact, be designed for all levels of education and teaching, taking into consideration the demands produced by these two phenomena. As a result of these new demands, it is necessary to draw up curricula based on two viewpoints:

openness to adopting flexible curricula, and the need to establish closer links between educational measures and a stronger interrelationship between theories, practices and experiments.

Flexible curricula, it seems, should play a key role in a world characterized by an accelerated renewal of knowledge and know-how. In this regard, according to Jesus Maria Sousa (in Boumard and Bouvet, 2000), flexible curricula offer the advantage of covering different levels of understanding. By introducing flexible curricula in teaching and training, it is possible to combine and interlink the universal, the singular, diversity, competition and solidarity in a globalized world.

In this sense, the curricula drawn up for different levels of education should gradually broaden the prospects offered to learners, moving one step at a time from the most singular to the most global (universal). The singular stresses the local characteristics of the living environment of the learner. Skills founded on local particularities can gradually expand to reach out to other realities and encompass the diversity of the world. Diversity helps to deal with teaching contents in a less self-centred way, with a higher degree of relativity and a more open attitude towards an interdependent world. It is in this respect that the universal encompasses what is common to the human species, to all societies and civilizations — hence, the need for a stronger sense of solidarity. And solidarity can be easily justified by sustainability.

To put it simply, "sustainability (can be perceived) as a way of managing the social, economic and environmental consequences and opportunities (of material and human resources) in order to transform them into lasting advantages at both local and world levels" (http://www.vancouver2010.com/fr/Sustainability; in French).

Given the numerous upheavals suffered by Sub-Saharan Africa, one of the ultimate goals of education should be to aim at sustainable development. In 1987, the Brundtland Report defined sustainable development as an objective that "meets the needs of the present generation without compromising the ability of future generations to meet their own needs." It must include three pillars: the economy, the environment and social equality (http://fr.wikipedia.org/wiki/Durabilit%C3%A9; in French).

Understanding sustainable development in this way implies acquiring new skills through action in the field of education. One of these skills is acquired through environmental education (a science in its own right, which stands at the junction of several disciplines), as defined by the Belgrade Charter (UNESCO-UNEP, 1976, quoted by Legendre, 1993:460). According to the Belgrade Charter, the purpose of environmental education is "to develop knowledge, values and new attitudes, the key factors for achieving a better quality of environment and, consequently, a better quality of life, for both contemporary and future generations living in this environment". In the view of Sauvé (quoted by Legendre, 1993:463), for instance, environmental education "actually integrates many aspects of education, including scientific education, civic education, political education, economic education, aesthetic education, social education, moral education and personal education". All these disciplines should be taught from a very early age. However, identifying the various disciplines that compose education for sustainable development, including environmental education, requires a pedagogical method based on an inter-disciplinary approach and not on mere juxtaposition.

In order to develop adequate skills for education for sustainable development, including environmental education, innovations need to be introduced during the very first years of formal education. An initiation into education for sustainable development and environmental education should start from early childhood, taking into account, in particular, the Meeting of Experts on the Psychological Development of Children and Its Effects on the Educational Process, held in Urbana, Illinois, USA (UNESCO 13, 1974).

Inter-disciplinarity should, therefore, lie at the centre of educational action. In comparison to the programmes currently dispensed by education systems (like the one in Senegal, for instance), all disciplines or major fields of education — such as ecology, economics, sociology, social anthropology, history, geography, etc. — should be strengthened in school contents by adopting a scientific approach. Innovations should consist of initiating learners as early as possible into scientific methods specific to these

Box 1: Depover, C. (2006). Conception and management of curriculum reforms Paris, UNESCO, ED/EPA/2006/PI/18 March 2006

CURRICULA AND STUDY PROGRAMMES

Among the aspects that distinguish curricula from study programmes, focusing on the outcomes of education occupies a determining position. Thus, in a curriculum, efforts will be made to express the goals of the education system in reference to what is expected from learners, whereas in a study programme, the interest will centre more on what the teacher should do to obtain these results.

To guide teachers on the way they should organise their lessons, some study programmes include methodological explanations. In a curriculum, on the other hand, efforts will be made to indicate what is expected of pupils without being prescriptive as to how teachers should organize themselves to obtain these results. Although it is considered useful to guide teachers in their choice of methodology, they will be provided with explanations in the form of a specific document, such as a teacher's textbook or a methodological guide.

The study programmes proposed to teachers have for a long time consisted in explicit reference to the subjects that should be taught. On the other hand, a curriculum concentrates exclusively on what pupils will be capable of achieving on the basis of those subjects. By replacing these study programmes with curricula, there has been a gradual shift from concentrating on the contents and the way they are organized, to a marked interest in what pupils can achieve on the basis of the contents they are taught. This shift in focus, from the subject to the learner, has also led to an interest not only in the logic of the subject but also, and above all, in the dynamics of the learning process.

The curriculum is part of a long-term approach that is closely connected with the choice of educational policies and governmental strategies on education. Examples are the Ten-year Plan for Education and Training in Senegal, the National Charter of Education and Training in Morocco, and the Ten-year Education Development Programme in Mali. Even though, strictly speaking, these educational policies do not always fall under the competence of educational authorities, it is often important to clarify the links between the curriculum and educational policy in order to understand clearly the logic of the curriculum.

OBJECTIVES AND SKILLS

These two notions are often used when referring to the operational aspects of the curriculum — that is to say, those that directly concern the practitioners of education. These objectives serve as short-term milestones (usually a teaching sequence) of educational action. This is why they normally lead to very precise formulations, making it easy to check whether the fixed goals have been accomplished. The notion of skill is usually more global and refers to the outcomes of education from a more long-term point of view (a few days or a few weeks) but, above all, it seeks to describe situations in which the different skills mobilized should be put into operation. As illustrated in the examples below, the implementation of a skill is linked to a context directly related to the situations that learners will have to handle in their everyday life or in the context of their future professional activity, such as communicating information, making decisions, arguing, solving a problem, etc.

OBJECTIVES

To pronounce correctly the phoneme /i/ as in piece, peace, peel;
To use vowel and consonant sequences correctly;
To mention the distribution structures proposed to housewives in a district;
To cite arguments in support of an idea.

SKILLS

To produce, in a situation of communication, and in response to an external request, a statement set out in intelligible terms (correct pronunciation of phonemes, clear articulation of syllables and words, the right sequence).
To prepare and conduct an investigation with a view to knowing the place where the housewives of a district make their purchases.
To give a well-argued opinion about a situation encountered at school or in the family.

An approach based on skills, applied through using real-life situations as models, leads to giving preference to a concept of learning that is both global and interdisciplinary whereas an outcome-oriented pedagogy favours the systematic division of contents into small units that will be studied successively and usually in the context of a specific discipline.

In practice, the distinction between objectives and skills is not always clear. For some, a skill is limited to grouping together several objectives around a situation, while for others, it is a question of inter-linking a series of skills to be able to handle a complex situation or a task directly connected with the professional, social or family integration of the learner.

constantly evolving fields of knowledge and know-how. Placing emphasis on scientific methods of investigation presupposes "the development of abilities to find, evaluate and explore scientific information..., to sharpen the critical mind, to seek to analyse and clarify values in the choices involved at the different phases of a scientific investigation ... and to recognise the close links between science, technology, society and the environment" (Sauvé, quoted by Legendre, 1993:465).

Reinforcing the views of Delors (1996), innovations should centre mainly on acquiring methods for lifelong learning (learning to learn) by adopting a genuinely critical attitude and by becoming familiar with deductive and inductive methods. In this regard, nothing can replace experimentation and demonstrations of actual situations, in the field if necessary, and frequently outside the school. More attention, therefore, should be paid to manipulation and manual activities for the purposes of verifying what could, appropriately, be called hypotheses.

Scientific education, which has been rehabilitated in the education systems of Sub-Saharan Africa, together with its closely related disciplines mentioned above, are "essential for the study and elucidation of environmental problems and the implementation of solutions" (UNESCO-UNEP, 1992; quoted by Legendre, 1993:464). Its principle objective would be the solution of numerous problems and difficulties faced by this part of the world. And, to attain this goal, the pedagogical attitudes towards education in Africa need to be reversed.

Pedagogical views in Sub-Saharan Africa are too frequently focused on literary studies to the detriment of scientific and technical disciplines. In many countries (in fact, in nearly all countries), there are more students in the literary sector than in scientific, vocational and technical courses. This trend should be reversed drastically. The preference given to studies leading to jobs in offices and public bodies should be rectified by rehabilitating manual work and direct observation, starting from school, and by strengthening the position and number of hours devoted to the exact sciences (mathematics), the experimental sciences (physics and chemistry), the observational sciences (life and earth sciences), technology, etc.

Hence there is an urgent necessity to strengthen skills, acquired mainly through education, to solve the serious difficulties experienced by Sub-Saharan Africa, so that it can belong directly and rightfully to the international scientific community. In other words, the skills to be acquired throughout education should be conducive to fighting against recurring hunger and famine in this part of the world, and also against pandemics such as malaria, drought, and the spread of deserts and desertification resulting from massive deforestation. They also should contribute to ensuring access to drinking water and health care for all, as well as finding clean and new sources of energy, etc. In addition, these targeted skills should lead to the personal development of individuals while respecting the indigenous values of the living environment and integrating them into educational action.

In general, school systems, school contents and programmes, and methods of teaching must focus on education for sustainable development, at all levels. This includes skills-based studies for environmental integrity, economic viability, and a just society for present and future generations (see UNESCO's website for education for sustainable development: http://portal.unesco.org/education/en/ev.php-URL_ID=27234&URL_DO=DO_TOPIC&URL_SECTION=201.html).

II-3. Indigenous programmes

Despite the considerable efforts made since the Conference of Addis Ababa in 1961, the teaching contents and educational methods in force in a large number of African countries continue to be rather extrovert in nature. New dynamic initiatives should be taken to achieve greater relevance and to ensure that educational programmes and methods are consistent with the real needs of Africa.

Bearing this in mind, the design of programmes constructed around an indigenous curriculum at the beginning of school education should be founded mainly on the values of each community. It should then spread, in concentric circles, to encompass the most common values of Sub-Saharan Africa and, finally, the rest of the world (see also Bernard, Nkengne and Robert, 2007). Additional efforts should be made to introduce contents specific to this part of the world into the education system. In this

respect, history and geography (and their closely connected disciplines), literature (written and oral/transcribed, traditional tales and poetry, etc.), as well as the life and earth sciences are conducive to determining the contents of education. And these disciplines should slowly shift from the immediate environment of the learners to those that are further away in space and time. Learners should be taught, at a very young age, how to acquire a broader understanding of their own world, as well as a better and more effective knowledge of the environments and populations interacting with the original milieu. Young learners should gradually build up a solid knowledge of all major groups and fields of education that form the cultural identity of societies and human groups in Sub-Saharan Africa. The contents, therefore, will be determined in relation to the large natural regions of the continent.

Learning and gradually acquiring a deeper knowledge of the major groups and fields of education should be oriented towards a better understanding of oneself and of others, to achieve a more fertile dialogue — this being a source of mutual understanding and tolerance. Education should prepare individuals to live in harmony with their environment and with others: hence the need to acquire skills for lifelong personal development.

II-4. The skills needed for personal development

The lasting acquisition of skills needed for personal development throughout a lifetime require an evaluation of the teaching programmes and activities applied at different levels of education and training, from early childhood to higher education. For this purpose, every country will equip itself with structures for evaluating and managing its education system, or will reinforce already existing ones. Based on a systemic approach, the priority of periodic assessments will be to define the quality and relevance of the education offered.

The objective, in this case, is to set up a permanent observatory on education that could eventually contribute to programmes designed to evaluate the skills appropriated by pupils. The task of this type of observatory (UEMOA, 2004:35) would be to provide information to decision-makers, beneficiaries of educational action and users, periodically and at the opportune time. Observatories of educational action also will serve to improve the collection of data in order to conduct and facilitate comparisons of the results of sub-regional and regional assessments. The creation of national observatories, and a general one common to all countries in Sub-Saharan Africa, will take into account the experience gained by the Monitoring Learning Achievement (MLA), the Programme for the Analysis of Educational Systems (PASEC) of the Conference of Ministers of Education of French-speaking Countries (CONFEMEN), the Southern African Consortium for Monitoring Educational Quality (SACMEQ), etc.

These models should be strengthened to improve their efficiency and overcome their limitations, which relate mainly to the "comparability of results within the same survey" and the "comparability of the results of different surveys" (UNESCO/Dakar Pole, 2005:69). Bearing this in mind, one of the medium-term objectives would be to create an effective observatory on education in Sub-Saharan Africa to serve as a reference for all countries.

To attain the goal of setting up an observatory on education in Sub-Saharan Africa, evaluations will be carried out according to a grid designed to take definitions of quality in education into consideration. Among the definitions in force, the ones of UNESCO and Pigozzi (UNESCO, 2004:32), UNICEF (UNICEF, 2000) and the World Bank are a good starting point.

In addition, the structure for the evaluation and governance of education systems will ensure the relevance of teaching programmes. They will pay special attention to their degree of coherence with the missions of education, as well as the needs and expectations of society and individuals, in a context of globalization and the tendency to consider education as a marketable commodity. Considered from the angle of relevance, the study should examine the links between education, productive activities and professional integration (UNESCO, 1998).

To achieve the requisite results, the management services of education systems should rely on indicators related, in

particular, to the unemployment rate and to the percentage of students who have integrated into the world of work on completion of their studies. They also will need to evaluate policies on educational programme exchanges, co-operation and the integration of African educational systems. Comparisons will range from sub-regional to regional levels, with a view to achieving greater harmony between education systems.

Ways of harmonizing education in Sub-Saharan Africa can be envisaged by placing emphasis on two points: languages in education, and the teaching of science and technology.

II-5a. Languages in education

Referring to the importance of the language of instruction, *The EFA Global Monitoring Report 2005* stresses that:

> *"Most countries of the world are bilingual or multilingual. Hence national language policy and the selection of languages to be taught in school and used as the media of instruction is of considerable importance for the quality of teaching and learning. It is a policy choice with implications for curriculum goals, content and pedagogy. It is also an intensely political matter. As UNESCO notes (UNESCO, 2003b): 'Educational policy makers have difficult decisions to make with regard to languages, schooling and the curriculum in which the technical and the political overlap. While there are strong educational arguments in favour of the mother tongue (or the first language of instruction), a careful balance also needs to be made between enabling people to use local languages in learning and providing access to global languages of communication through education'."*
> (UNESCO 2004:154)

In general, it seems to be accepted that initial literacy programmes in the mother tongue facilitate the learning of a second language as the medium of instruction (UNESCO, 2004:154–157). The analysis made by the UNESCO 2005 Report, backed by examples of the accompanying policies on languages of instruction, refers mainly to countries in Sub-Saharan Africa (UNESCO, 2004:154–157). Very often, the languages used for instruction perpetuate past heritage. Many countries in Sub-Saharan Africa still have education systems that use a foreign language (English, French or Portuguese) as the main language for teaching and the medium of instruction. However, the countries still concerned can derive benefits from the review of experiments under way and those that have been undertaken elsewhere, outside of this particular geographical zone (for example, in North Africa, Mauritania, etc.).

The introduction of national or regional languages as the main medium of education does not exclude the urgency of introducing a second language of international communication in education. A second language should be introduced into the educational system as early as possible. The experiences of several countries have shown that children learn and master languages more easily when they start at a very young age. Niger seems to have opted for introducing national languages into its education system at a very early stage. (See Box 2.)

However, given the wide diversity and large number of African languages, as well as their geographical limitations, the major languages of international communication used in numerous education systems in Sub-Saharan Africa should be retained by improving their teaching and practice. Adding a second language of international communication in the education system will depend on the existence of a first language of a similar nature. A major argument in favour of introducing a second language as early as possible (in early childhood care and education centres, or at the beginning of primary education) is based on improving communication between linguistic areas dominated by languages such as English, French, Portuguese, etc. Bilingualism practiced in school also will have the advantage of facilitating dialogue and fostering mutual understanding among the individuals benefiting from this. (By way of example, French-speaking countries in Sub-Saharan Africa could adopt English as a second language, while English-speaking countries could adopt French as their second language.) The purpose of this option would be to develop bilingualism in all countries.

Learning a second language would, in this way, help to consolidate international communications and inter-African co-operation, these being vehicles of integration.

In terms of innovative programmes for the introduction of several languages in education, the above-mentioned 2005 Global Monitoring Report puts forward consistent arguments in favour of a gradual strategy. It would appear that:

> *"There is now a strong body of evidence that bilingual schooling offers significant benefits in learning outcomes. In the most successful models, the mother tongue is used in the early years of schooling so that children can acquire and develop the literacy skills that enable fuller participation in learning activities. In a growing number of countries, after four or five years (earlier in some cases) there is a transition to learning and using the second or foreign language as the medium of instruction. In this way, initial literacy is acquired more easily, facilitating the acquisition of the language that will become the medium of instruction for the rest of the school years"* (UNESCO, 2004:154–156).

The arguments put forward by UNESCO are backed by the results of experiments in progress in Sub-Saharan Africa. In Senegal, for example, a growing number of pre-primary and primary schools offer their pupils English lessons, in addition to French, the official language of instruction. This practice tends to widen social disparities in the area of education, because only pupils attending private schools or special early childhood care and education centres benefit from an early initiation into English.

To ensure social equality in countries where such practices and experiments are being developed — but also to facilitate and improve communications between countries in this region — French and English could be adopted ipso facto as the second teaching language, starting from early childhood care and education centres. An innovation of this type would take into account the arguments and illustrations developed in the 2005 EFA Global Monitoring Report (UNESCO, 2004:154–157). The experiences of Papua-New Guinea and Zambia could inspire many countries in Sub-Saharan Africa.

> *"In Zambia, a 1996 policy statement, 'Educating Our Future', agreed with the National Reading Committee's (NRC) conclusions. With external assistance from the United Kingdom's Department for International Development (DFID), the Ministry of Education initiated the Zambia Primary Reading Programme (PRP). This programme was a systematic attempt to improve reading and writing in all primary schools, with goals for each grade level: basic literacy in a familiar language by the end of the first year of primary education, basic literacy in English by*

Box 2: Republic of Niger, Ministry of Basic Education and Literacy, General Secretariat National Advisory Commission for the Orientation of Curricula/Observatory on Reforms in Education/University of Quebec in Montreal (February 2006). Implementation of the Ten-year Education Development Plan/PPDE. Framework of Guidelines for Curricula.

http://www.ore.uqam.ca/Archives/Documentation_txt.asp

LANGUAGES OF INSTRUCTION

In conformity with the education orientation law (LOSEN) and in line with a radical reform of curricula, particular emphasis has been placed on teaching in the mother tongue or the first language of pupils during the first stage of basic education. Study programmes therefore will be adapted to all national languages and tested throughout the country. This experiment/extension will be founded on the model of experimental schools, with achievements that have been demonstrated by several studies.

In principle, it is a question of initiating education in the mother tongue or first language of learners in order to establish basic skills, and then gradually move towards French, the teaching language, in the second stage of basic education, the national language becoming a subject of teaching in this cycle. In concrete terms, the modalities for handling languages in these experimental schools are as follows. During the first year of the first sub-cycle (CI), teaching is exclusively in the maternal or first language; French is introduced orally in the second year of the first sub-cycle (CP) and in written form in the first year of the second sub-cycle (CE1). Starting from the first year of the second sub-cycle, French becomes the language of instruction and the mother tongue or first language is taught as a subject in its own right. As for non-formal education, the language of instruction depends on the choice made by the target group.

the end of the second year and improvement in the teaching of reading at all grade levels through appropriate training and materials. Early assessments and evaluations have been encouraging. More broadly, the focus on literacy has helped secure observable success in that parents and communities have responded warmly to the change" (UNESCO 2004: 156).

The multilingualism advocated by these experiences requires the implementation of official strategies and instructions aimed at improving the quality of learning through a perfect knowledge of the teaching languages. Clear policies must be adopted, especially in countries where pedagogical practices are similar to those of Senegal, and where pupils and teachers speak a pidgin dialect that is inappropriate for education of an international standard. Such practices have a negative effect on performance levels, especially in French, as disclosed by international evaluations. For example, "In six of the French-speaking countries covered in the PASEC study (including Senegal) [1997-2001], between 14% to 43% of grade 5 pupils have low achievement in either French or mathematics" (UNESCO, 2004:227).

The introduction of national languages, like the introduction of a second language of international communication, should be founded on solid pedagogical methods, avoiding the use of teaching styles that are typical of popular dialects (as this heavily undermines the quality of education). For example, very frequently in West African countries such as Senegal, teachers do not hesitate to resort to local languages when teaching their classes and giving explanations to their pupils. Teaching pupils in a pidgin composed of local languages and French usually results in their knowledge of French gradually declining at nearly all levels of education, including university.

A perfect knowledge of the teaching languages also facilities the achievements of pupils, especially in scientific and technological disciplines.

II-5b. The teaching of science and technology

As upheld by the authors of a study undertaken by the Regional Office for Education in Africa (UNESCO-BREDA, December 2002), "the impact of science and technology on society no longer needs to be proved, it is sufficient to see what is happening around us to be convinced." These authors also quote Baez, who stresses that:

"Whoever lives in a modern town or near a modern town, in any part of the world, has an opportunity to see, hear and touch all day long a multitude of objects that show to what extent the life of men and women are conditioned by science and technology. Science and technology exert a crucial influence and have been powerful factors of social change throughout the history of mankind, even though what we call science today is not even three hundred years old" (UNESCO-BREDA, December 2002).

The teaching of science and technology must be reinforced, and its methods updated, based on the link between theory and practice. Children should be introduced to an inquiry-based approach to science at the youngest age possible. Young pupils should learn about science through entertaining and motor activities at the pre-primary level, and later through relatively more formal activities at primary school. The French experience, known as "la main à la pâte" (see Box 3), applied in West Africa (Senegal, Benin and other countries), could be extended to the rest of the continent.

According to the on-line encyclopaedia Wikipedia:

"La main à la pâte is a pedagogical operation for teaching science at school in France. Created in 1996 by Professor Georges Chaptal, it is an innovative way of teaching the sciences at primary school. It places the accent on scientific learning, knowledge of languages, education and citizenship. This programme is designed for teachers to enable them to help their pupils discover an aspect of science through different experiments on specific theme: water, time, waste, gear mechanisms, electricity and many other subjects. This is carried out with the help of a student, researcher or resource person who can give the teacher scientific support.... This way of teaching science was imported from a method used in the USA but similar approaches have emerged in France, notably through the association Planète Sciences, thanks to different scientific projects, including Un ballon pour l'école, also based on experiments and construction carried out by the pupils themselves."
(http://fr.wikipedia.org/wiki/La_main_%C3%A0_la_p%C3%A2te)

The authors of the 2002 UNESCO-BREDA study (UNESCO-BREDA, December 2002), based on a review of the abundant literature existing on this topic, stress that: "The objectives of teaching science in general, in addition to acquiring scientific knowledge, includes the acquisition of theoretical and experimental scientific approaches, stimulation of scientific curiosity, an interest in research on the part of the learners, and the development of a sense of initiative and a questioning attitude."

According to these authors, to fulfil the objectives of scientific education, "pupils must be taught to reflect and understand scientific facts through a series of hypotheses and experimental verifications that would require them to display initiative, know-how and rigour." They also underline that:

> *"Experimental activity should not only include actual manipulation but also time devoted to reflection, intellectual construction, introspection, and discussions with the teacher. The activity of the pupil is therefore centred on the operations that the subject has carried out, and on the results and interrelationship between the two (operations and results). In consequence, it is not reduced to concrete manipulations carried out by the pupil. In terms of school education, the entire difference between learning and tinkering is to be found in this distinction."*

The list of objectives for teaching science suggested in this study is quite exhaustive, and it also is sufficiently referenced. It thus could serve as a basis for innovation in scientific experimentation (UNESCO-BREDA, December 2002). The goals mentioned are to:

- prepare the learner to pose and formulate a scientific problem;
- show the learner how to conduct a scientific experiment;
- facilitate the reconstruction of scientific concepts;
- acquire the means for scientific communication through clear and precise expressions;
- produce graphic representations (sketches and tables), and use symbolic language, etc.;

Box 3: Liaison Newsletter of La Main à la pâte – special international supplement of issue 30, February 2005. Published with the support of the National Pedagogical Research Institute (p. 2)

"SCIENCE AT SCHOOL" ACTIONS ALREADY UNDERTAKEN:

Senegal has had relations with La main à la pâte since 1999. Several missions by French instructors were conducted for a public composed mainly of officials of the National Education Department. Scientific kits were placed at the disposal of 114 schools, in 6 of the 11 academies.

AT PRESENT

The Senegalese Ministry of Education has included several measures in its action plan to upgrade the scientific sectors. These measures include communications aimed at the general public through radio broadcasts to popularize the sciences, and the organization of scientific events, the purpose being to bring schools closer to the scientific world. This action plan also consists of a section on training teachers and creating the appropriate teaching materials. For the moment, the schools have used the French kits. At present, the objective is to create kits with the help of very simple, inexpensive and even recycled materials. These kits will be accompanied by pedagogical protocols.

THE DIFFICULTIES

The experiments undertaken so far have revealed that teachers tend to adopt an approach based on experimental demonstration without really allowing their pupils the initiative to draw up hypotheses and carry out experiments manually. Naturally, the overcrowded classes – an average of 44 pupils per class – and the lack of resources do not simplify matters. In a context in which basic skills (reading, writing and numeracy) are already difficult to achieve, how can teachers be motivated to teach the sciences? Reading and writing difficulties continue to be considerable at the end of primary education. It is probably necessary to place scientific learning more at the service of mastering a language.

Nicolas Poussielgue

http://pequenoscientificos.uniandes.edu.co/Documentos/map_inter_epreuv33.pdf

- improve the psychomotor aspect and manual skills of the learner;
- develop a capacity to make an observation;
- encourage a questioning attitude;
- transmit pre-constructed scientific models;
- adopt safety practices, etc.

To revitalize and develop the teaching of science and technology, learners should be introduced to similar objectives as early as possible in order to understand them perfectly. Sharpening the mind and encouraging an interest in scientific investigation, therefore, should be started when children are very young, and then consolidated throughout secondary school and higher education. During the first years of school, for example, activities to teach science and technology could be based on constructing and experimenting with simple assemblies, such as meccano (model construction) sets. These assembled constructions, which could become more complex depending on the grade, will be designed to help pupils understand the elementary and fundamental principles of scientific knowledge and its applications.

The option of reinforcing the quality of scientific and technological education at a very early stage should be accompanied by a closer link between theory and practice. Teaching the rules, laws and theorems of mathematics, and the principles and rules of physics, chemistry and the life and earth sciences (biology, geology, etc.) is more effective when it is built on activities and experiments carried out by the learners themselves rather than through theoretical classes or learning by rote merely for the sake of repeating the lessons in examinations.

According to the UNESCO-BREDA study on the teaching of microscience:

> *"In general, experts distinguish between two types of experimental approaches: the experimental approach of researchers (the scholarly method) and the experimental approach used in schools.... The scholarly approach implies the elaboration of physical concepts in six stages:*
> *- formulation of a research problem;*
> *- formulation of theories;*
> *- elaboration of an experimental protocol;*
> *- practical implementation and capitalisation of the results of the measures;*
> *- analysis and interpretation of the results;*
> *- conclusions."*
>
> *"(...) This approach is not sequential or linear. However, from the viewpoint of teaching, several research studies ... have demonstrated that the school experimental approach usually followed in classes consists of a stereotyped method in four stages: observation, prototype experiment, interpretation and formulation. This is how nearly all manuals on the physical sciences of the 1990s, and even later years, have set forth concepts and laws according to an approach that starts with observation and then moves to conducting a prototype experiment that usually serves to back the induction of a physical law."*
>
> *"When comparing the scholarly and school approaches, it can be noted that pupils are rarely involved in the intellectual activities of the scientist (formulating problem, elaborating theories, etc). They are mainly given technical tasks (listing the measures, assembling or dismantling tests, etc.). This is why pupils often fail to perceive the connection between experience and theory"* (UNESCO-BREDA, December 2002).

Taking these observations into consideration, innovation in the field of scientific and technological education could be carried out in accordance with a minimum of criteria and conditions, notably:

- consolidation of linguistic expression aimed at a better understanding of the scientific discourse and a more precise manipulation of concepts;
- more time devoted to science, starting from early childhood care and education, and continuing throughout schooling;
- strengthening of experimentation and observation through objects that can be manipulated;
- applications and illustrations of fundamental laws and principles through situations that are close to reality (for example, by demonstrating the usefulness and application of statistics in everyday life, as applied to demography, economic indicators, etc.)

New approaches are urgently needed to revitalize the teaching of science and technology. Reinforcing scientific and technological disciplines in education systems also should be aimed at renewing technical and vocational training (UNESCO 19). It is only at this price that

education will be able to place qualified workers in the job market.

On the whole, seeking to obtain global and total quality in education requires revitalizing the disciplines needed for sustainability and environmental education. Quality education obliges countries in Sub-Saharan Africa, in particular, to consider local characteristics in order to move towards a more universal approach. To improve school performances and their impact, it is necessary to strengthen the teaching of science and technology, based on a perfect knowledge of the languages of instruction (another factor of regional integration).

In addition to these major orientations, Sub-Saharan Africa has other challenges to face because of their education systems.

III. SPECIFIC EDUCATIONAL PROGRAMMES

This section deals with four topics. The first is solving the problem of armed conflicts (III-1). The second relates to health education, including the fight against HIV/AIDS and preventive measures, a top priority in view of its impact on the quality of education (III-2). The third concerns minorities, displaced persons and refugees (III-3); this topic sheds new light on education for the prevention and fight against armed conflicts. The fourth topic is higher education (III-4), wherein it is proposed that a grid be established for evaluating universities and higher education institutions in Sub-Saharan Africa, and that programmes and experiences be pooled among universities.

Pursuing the second objective set by the Dakar Forum provides a reasonable base to build up specific educational programmes in Sub-Saharan Africa. In effect, the goal is: "Ensuring that by 2015 all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to complete free and compulsory primary education of good quality." (http://fr.wikipedia.org/wiki/Forum_mondial_sur_l'%C3%A9ducation,_Dakar_2000; in French).

However, the list of identified targets is not exhaustive. It could, in a more explicit way, include persons affected by HIV/AIDS directly (the patients) or indirectly (the orphans), those living with a disability, displaced persons, refugees, etc.

III-1. Prevention of armed conflicts

Armed conflicts are a major obstacle to development in Sub-Saharan Africa (UNESCO, 2003:128). It is acknowledged that over "80% of the world's wars are in Africa and Asia" (UNESCO, 2003:131). The prevention of armed conflicts should be a common concern of the great majority of countries in Sub-Saharan Africa. Education can attenuate the incomprehension that lies at the origin of conflicts and foster a dialogue of cultures and mutual understanding (University of Lubumbashi, 2002). The Delors Report (Delors, 1996) raises these questions and identifies areas for reflection and action. Education has always played a fundamental role of reconciliation, understanding and tolerance.

When conducting a sociological and historical review of the effects of education on the modernity and local re-composition of meaning, Sall (1996) described the role of fostering dialogue and understanding that education has played, and continues to play, by forming entire generations of Africans of various nationalities in different educational institutions. This positive effect of education on individuals, and the dynamics of mutual understanding and tolerance that it sets in motion, seems to result in cohabitation during the same time-frame and in the same area. The positive effect of education also is due to the fact that it permits individuals of different nationalities to follow similar studies and receive similar training. Cohabitation while studying in the same place and during the same period creates an esprit de corps (like in the army) and, later, the feeling of belonging to a community and to the same family.

The lessons learned from these historical experiences, combined with the situation of an armed conflict, justify the options recently adopted by the Democratic Republic of Congo (DRC; Democratic Republic of Congo, 2004) and Côte d'Ivoire (see Box 4). One of the major innovations introduced in higher education programmes in the DRC

consists of four common modules that are compulsory in all sections and at all levels. These modules deal with logic and argumentation, general psychology, the history and institutions of the Congo, and citizenship education (Democratic Republic of Congo, 2004).

Drawing inspiration from the DRC model, general psychology and citizenship education could be adopted by all education systems in Sub-Saharan Africa. The main interest in introducing general psychology would be to study the mentalities specific to each country, or to the human communities living therein, in order to encourage understanding and dialogue. Citizenship education would deal more specifically with teaching the notions of democracy and co-operation, in the same way as education on human rights and peace. It could be introduced through subtle methods adapted to early childhood education through activities within the reach of this age group. It could then continue in primary school and during the first years of secondary school by having students study books and undertake activities of a moral and civic nature. During the last years of secondary school, and later in higher education, it would be based on philosophical, political and legal studies. Citizenship education should be complemented by education on peace and on human rights.

III-2. Health education, and the fight against HIV/AIDS and its prevention

Sub-Saharan Africa has the highest number of people suffering from HIV/AIDS in the world. The specific programmes relating to health, and the fight against this pandemic and its prevention, should have a high priority, comparable to that given to the type of education designed to prevent armed conflicts.

Education can have a positive effect on these disasters. According to Tanko:

> *"Specialised documentation shows that women in Africa lack information and education in the field of health in general, and AIDS in particular. Many women are at risk because educators, health officers or the media fail to tell them about HIV/AIDS or explain how to protect themselves and others. And this despite the fact that, according to UNAIDS ... it has been known how to make use of education and communication to halt HIV/AIDS all over the world for more than fifteen years. Women still have few opportunities to learn about HIV/AIDS"* (Tanko, 2004-2005:55).

In view of the low rate of enrolment and retention in education systems, as well as the mediocre literacy levels among adults, the comments of Tanko, which focused mainly on women, can be extended to cover all groups and all social categories. Education in the field of health and the fight against AIDS has failed to obtain the expected results because school enrolment is still low in several countries. The low rates of school enrolment and retention are major obstacles to access to quality education for all. The negative repercussions of the mediocre level of general education of populations in terms of health and hygiene are, in turn, aggravated by social behaviour patterns, such as early marriages, traditional beliefs and taboos, and even, sometimes, religious beliefs.

Educational practices should be reversed to improve public health and hygiene. Formal education leaves very little room for educational programmes aimed at improving health and preventing HIV/AIDS. Specific programmes designed to halt major pandemics, such as AIDS and malaria, are frequently developed outside the context of formal education. Admittedly, many schools incorporate projects of the United Nations Population Programme that are intended to give students the right reflexes in terms of education on population growth. Similarly, many programmes are devoted to health education and the prevention of HIV/AIDS. Unfortunately such programmes usually enter secondary schools through the back door only. In Senegal, for example, they come in the form of secondary activities conducted by clubs, under the responsibility of an NGO or an association such as GEEP (Group for the Study and Teaching of the Population), based at the Faculty of Sciences and Technologies of Education and Training (FASTEF).

However, as Tanko appropriately stresses:

> *"The best potential in the combat against AIDS is nevertheless that of an educational programme incorporated in the teaching programmes of formal systems. The fact that the formal system can offer an easy-to-reach audience means it is necessary to ensure a high standard of content and presentation methods ... so that the pupils, whatever*

their age, feel personally concerned by the information disseminated, and assimilate it in such a way as to subsequently change their behaviour in the right direction" (Tanko 2004–2005:115–117).

The special inter-agency team of UNAIDS has apparently adopted a similar position on the role of education in the combat against HIV/AIDS and its prevention. In effect:

"In May 2003, the team published HIV/AIDS and Education: A Strategic Approach. This recognises that the EFA and Millennium Development Goals may not be achieved in many countries because of HIV/AIDS, in many cases for lack of a coherent education sector strategy designed to respond to the HIV/AIDS epidemic. It identifies policies with the potential to mitigate the impact of HIV/AIDS on individuals, educational processes and systems, and to use education for preventing HIV infection" (UNSECO, 2003:262).

Efforts are emerging to introduce such contents in formal education in an effective way. At the sub-regional Seminar of the Economic and Monetary Community of Central Africa (CEMAC) and the DRC, held in Douala, Cameroon, from 12 to 16 February 2007 (see Box 5), it was suggested that education in the field of health and the fight against HIV/AIDS and its prevention was a cross-disciplinary educational theme. In general, the prevention of HIV/AIDS should have a priority position in the institutions and curricula of formal education. This kind of educational option could draw inspiration from the experience and approach adopted by the Soul City Institute for Health and Development Communication in South Africa (World Bank 2004:47–75). This objective also could be founded on the guidelines recommended by CEMAC-DRC (IBE/UNESCO 2007).

The multimedia educational and entertainment project for children in South Africa, conceived by the Soul City Institute, is aimed mainly at children between 8 and 12 years of age. The South African experience could be applied to other countries in the region. It could even be

Box 4: UNOCI launches education for peace for young people in Côte d'Ivoire COTE D'IVOIRE – 5 August 2007 - PANAPRESS

JeuneAfrique.com

The United Nations Operation in Côte d'Ivoire (UNOCI) is continuing in Elokato, in the town of Bingerville (36 km from Abidjan), the activities of its communication project on the culture of peace, launched on Friday in the presence of the Stars of Peace of UNOCI and the traditional chiefs of the village, reported PANA.

During the three-day event, about one hundred children participated in the awareness raising campaign on mediation and conflict management. They were also taught the rudiments of "non-violent communication", and initiated into the culture of peace and tolerance.

The Director of the UNOCI Information Office, Margheita Amodeo, explained that in addition to its main mission to monitor peace in Côte d'Ivoire, UNOCI uses these activities to organize action aimed at introducing a sense of peace within each person. "We would like to help you become agents of peace through your everyday behaviour, among your family and your close circles", she declared.

Presenting this aid project, Mrs. Amodeo pointed out that UNOCI has already undertaken several activities of a similar nature all over the country, especially in the west of Côte d'Ivoire and at Anyama, where the traditional chiefs signed a commitment in favour of peace.

Furthermore, the UN mission plans to organize training seminars on the culture of peace, designed for young people and instructors all over the country, in order to disseminate this initiative, which will benefit from a partnership with the Centre for Research and Action on Peace (CERAP).

The spokesman for the traditional chiefs attending this ceremony, Kouassi Raymond, explained their mediation methods to the young people present — in particular, dialogue and respect for others — indicating that this procedure enables the population to live in perfect harmony.

adapted to younger children, and extended to their elders. Healthy habits and the right reflexes should be inculcated in children when they are very young, while they are still able to learn and absorb what they learn as personal experiences.

The experiences mentioned above tend to give priority to including education on the fight against AIDS and its prevention in formal teaching. For this purpose, many different educational projects and programmes on population and reproduction education, as well as the fight against AIDS and its prevention, should be taught in the earth and life sciences classes, as this is their natural place.

Discrimination against HIV/AIDS patients and carriers also hits other social categories, such as minorities, displaced persons, refugees, the disabled, etc.

III-3. Minorities, displaced persons or refugees, and people living with a disability

The concepts of minorities or people with specific needs cover a variety of realities in terms of education and the way it is organized and functions. These notions apply to orphans, street children, women, etc. UNICEF produced a revealing report on "The State of the World's Children in 2004" (UNICEF, 2004). The Forum for African Women Educationalists conducted a similar review of education for girls (FAWE, 2000, 2001). Following in the footsteps of Diane Richler from the NGO International Inclusion, it would be appropriate to add to these categories pupils suffering from learning difficulties at school. This category includes weak and below-average pupils, but also those who are exceptionally gifted:

> *"In most classes there are pupils whose performance is well below average and others who are well above average, which means that teachers have to be capable of teaching a range of pupils of varying capacities even though their training rarely prepares them to cope with this kind of situation. Planning often assumes that average students form the majority, but in classrooms, especially in countries facing multiple challenges, few children fit the 'average'. Disability is simply one element of diversity that must be taken into account in a classroom. In order to address this dual challenge, school systems must focus on how to meet the special educational needs of children with a disability while contributing to the overall improvement of the school systems"* (Richler, 2005).

According to the EFA Global Monitoring Report for 2003/4, "indigenous children and young people perform less well than children of non-indigenous groups" (UNESCO, 2003:134). A number of empirical observations reveal that certain social groups tend to exclude themselves from formal education (gypsies and similar groups are frequently mentioned as belonging to this category). In Africa, among the de facto excluded groups are nomads, herdsmen and fishermen. These social groups tend to show a certain reticence or resistance to schools, and rarely send their children to school. And when children from such groups do attend school, they do not succeed as well as others.

Theories attempting to explain failure at school typically point to the social origin of the pupil, social and economic factors, and motivation. Research on the connection between failure at school and motivation/engagement should investigate this aspect further. Factors of this nature can be linked to an inadequate school system: inadequate adjustment of the context to these categories of learners and, reciprocally, inadequate adjustment of these learners to the context of formal education. These inadequacies are frequently accompanied by a lack of interest in schooling. This disinterest appears to be the consequence of a failure to cover the needs and characteristics of these marginalized populations in the curricula, organization and functioning of the formal education system.

Because these sensitive groups are poorly integrated into the social fabric and have little schooling, the host community frequently looks upon them as being on the fringe of society. They also are considered to be the perpetrators of criminal offences and acts of violence. The discrimination they are subjected to pushes them even further to the outer fringes of society. Similarly, in many countries in Sub-Saharan Africa, the attitude towards people suffering from physical, mental and sensory disabilities, or albinos, isolates them socially from the rest of the community to some extent.

In view of the obligation to include these different categories of people into their host communities, curricula must be developed in such a way as to take into consideration the results and recommendations of the World Conference on Special Education Needs, organized in June 1994 by UNESCO in collaboration with the Spanish government. The theme was "Access and Quality", and:

"The purpose of this conference was not only to study a way to advance the objective of the Jomtien Conference on Education For All but also, and above all, to promote the inclusion of children with special educational needs (handicapped children, children with serious learning difficulties, etc.) into the ordinary educational system. It is a question of promoting the principle whereby ordinary schools should accept all children, whatever their difficulties (all handicaps, and other difficulties)" (UNESCO-BREDA 1).

Box 5: International Bureau of Education (IBE), UNESCO, Geneva, and the UNESCO Multi-country Office, Yaoundé. Sub-regional Seminar on the Diagnosis and Elaboration of Reference Documents for Education on HIV/AIDS in the School Systems of CEMAC Countries plus the Democratic Republic of Congo, Douala, 12-16 February 2007, Report, pp. 15–16.

THE RECOMMENDATIONS

Following their discussions, participants in the Sub-regional Seminar on the Diagnosis and Elaboration of Reference Documents for Education on HFV/AIDS in the School Systems of CEMAC Countries and the DRC, held from 12 to 16 February 2007 in Douala, drew up the following recommendations:

1. Organisation at country level of sessions reproducing the results of three sub-regional workshops.
2. Organisation of national workshops to elaborate and ratify programmes and pedagogical aids for HIV/AIDS.
3. Official inclusion, through a governmental act, of HIV/AIDS education in national teaching and training curricula.
4. Technical and/or financial support of the CEMAC Executive Secretariat at UNESCO, the World Bank, the International Bureau of Education and other technical and financial partners of CEMAC countries and the DRC involved in policies to integrate HIV/AIDS education in school programmes.
5. Studies on the effects of HIV/AIDS on education by six member countries of CEMAC.
6. Acceleration of the process of elaborating national policies to introduce HIV/AIDS education in school programmes.
7. Capitalisation of sub-regional expertise through exchanges of information, experiences and good practices.
8. Organisation of a preparatory meeting of experts from the sub-region for the Conference of Ministers of Education of CEMAC and the DRC.
9. Support of the CEMAC Executive Secretariat for the implementation of policies integrating HIV/AIDS education.

The framework of reference

- Inclusion of HIV/AIDS education in school programmes as a cross-disciplinary subject.
- Three to five disciplines identified as the host disciplines for HIV/AIDS education in secondary schools and teacher training courses (N.B. primary education occupies a place apart because there is only one teacher who handles all the disciplines. It is nevertheless important to identify which discipline will incorporate which content).
- Allocation of specific hours clearly devoted to the subject (64 hours a year).
- Identification of vital themes (based on the recommendations of the IBE).

1. Basic knowledge to protect and promote health; a) sexual and reproductive health, b) HIV and AIDS, c) advice, treatment and care, d) myths and erroneous concepts.
2. Me, my feelings and my relations with others: a) learning to know myself, respect myself and respect others, b) coping with difficult and risky situations, c) facing loss and mourning.
3. Gender issues and promotion of equality between men and women: a) economic, cultural and social roles according to gender, b) gender and vulnerability, c) local norms, family life and gender.
4. Promotion of human rights, the fight against stigmatisation and discrimination: a) rights and physical integrity, b) impact of HIV/AIDS and support for people living with HIV/AIDS, c) overcoming the wall of silence.

This framework of reference will serve as a common working base for the countries involved in order to harmonise all aspects of the problem while respecting national characteristics.

http://www.ibe.unesco.org

It adopted the Salamanca Declaration and a framework for action covering special educational needs, which was inspired by the experiences of the participants as well as the recommendations, resolutions and publications of the United Nations — particularly the United Nations Standard Rules on the Equalisation of Persons with Disabilities (Resolution A/RES/48/96), composed of two reference documents on the application of the principle of inclusion (UNESCO-BREDA 1).

The merit of the 1994 conference, above all, was that it conceived of "an inclusive system of education ... as a principle whereby schools must accept all children, including those who are disabled. In this way, they respond to the principle of recognising the need to work together in an integrating environment" (UNESCO-BREDA 1).

More recently, in April 2005, UNESCO-BREDA organized a workshop to validate the reference strategic framework for the promotion of literacy for the visually disabled in West Africa. This workshop observed that:

> *"To attain the objective of Education for All between now and the year 2015, it is not only necessary to broaden an inclusive education system for a more effective mainstreaming of children and adolescents with special needs into the ordinary education system, but also to introduce literacy programmes for adults who never had an opportunity to attend school"* (UNESCO-BREDA, April 2005).

It is crucial to bear in mind that "uniform models of reform which ignore the multiple disadvantages many people face will fail" (UNESCO, 2004:231). If persons are excluded from education because of disabilities, this will have negative repercussions on the overall quality of education. To ensure that the different categories of disabled persons are enrolled and taught in formal education institutions, curricula will have to include sections that enhance the value of their culture among all students. Such curricula should seek to instil a strong sense of solidarity and a genuine spirit of understanding and tolerance among learners of the same generation and same age group. In this case, too, it is a question of enabling them to acquire new habits and reflexes that would attenuate negative discrimination.

In consequence, strengthening and improving the quality of education in Sub-Saharan Africa necessarily implies programmes that incorporate cultural and individual diversity (see Box 6). "Education should be inclusive, responding to the diverse needs and circumstances of learners and giving appropriate weight to the abilities, skills and knowledge they bring to the teaching and learning process" (UNESCO 2004:143).

Given the diversity of disabilities that can have a negative effect on the schooling of an individual, the actual concept of a disability and the ways of handling it must be redefined. Diana Richler (2005) stresses:

> *"First, it is helpful to recognise that special educational needs might derive from disability, disadvantage or difficulty learning. Having a disability does not, however, necessarily mean having a special educational need. For example, a physically disabled child might need a wheelchair, transportation and a ramp to get into school but might not need any academic supports. Second, all children with special educational needs could benefit from the same framework for support that could include a new role for the special education teacher, focus on new instructional strategies, commitment to staff development, sustained problem-solving orientation, and school-based services teams. Thirdly, and perhaps most important, in many countries, different departments and even different ministries have responsibility for the education of children with disabilities. Until planning for the education of children with special educational needs is integrated in overall planning, inclusion is impossible By concentrating on inclusion, it is important to make sure that the unique needs of handicapped students are not neglected."*

> *"As for the United Nations Convention on the Rights of Handicapped Persons, the International Disability Caucus recommends that the clause concerning education should guarantee that handicapped students receive an education for which the State provides the 'learning materials through appropriate assistance measures, ways and means of augmentative and alternative communication, sign language, including the language of touch signs, Braille, relief, unprocessed texts and other alternative formats, a universal and accessible environment, sign language interpreters, assistance of all kinds, and other arrangements'."*

This is consistent with the position taken recently by organizations of persons with disabilities and their families who achieved consensus that inclusive education should be the right of all children, but that in the case of deaf, blind and deaf-blind children, there are times when a special programme may be warranted. Because many are not able to provide peer support, they argue that blind, deaf and deaf-blind children and young persons should have the right to receive education in their own language and in their own group.

What was missing after Salamanca was a mechanism for linking these proposals to more general efforts at reform. Because most planning for broader educational reform is done without considering students with disabilities or other special educational needs, changes are being made that will actually make it more difficult for students with disabilities to be included in the future. For example, every time a new school is built without meeting requirements for physical accessibility, generations of physically disabled young people are sentenced to be excluded from regular schools. Every time teacher-training programmes are modified without preparing teachers to teach at multiple levels, or when special education teachers are trained to work only in segregated settings, a generation of students with special educational needs is sentenced to remain out of regular classes. Every time national standardized testing is developed without allowing for accommodation of differences, students with special educational needs are destined to fail. Furthermore, the more that is invested in educational reform which excludes students with special educational needs, the more costs will be incurred in the future to retrofit these systems.

Although the recommendations from Salamanca are far from being implemented, there are hopeful signs that the concept of inclusion of all students in regular education is taking hold. Inclusive education in Africa is gaining momentum across the continent and is now supported by three coinciding and complementary initiatives that are shaping education reform and provision throughout Africa. The Education For All initiative, the New

Box 6: Céline Chevarin, Kristelle Hourques, Valérie Jay, Célina Salvador, Anne-Claire Tyssandier: Education et Pauvreté, Le cas de l'Afrique.

Another African problem concerns child labour and the civil wars raging on the continent that use children, referred to as child-soldiers. Since the usual type of schooling cannot reach these children, who are not enrolled at school or have dropped out of school, a non-formal education system has been developed to cater for such groups.

First of all, non-formal education is an innovation that breaks away from usual practices by providing special programmes for children who need to be taken into consideration because they have been pushed to the fringe in institutional and pedagogical terms. It also gives a second chance to the beneficiaries themselves, as well as to the country and its development. In effect, for the former, it is an opportunity to catch up with what they have lost or missed in education, and for the latter, it is an occasion to fulfil a duty, that of providing education for all children of society.

The adopted strategy takes into account the difficulties that obstruct schooling. Flexibility and adaptation are the key words to retain the beneficiaries in these programmes by offering a "customized" education. For the programme to meet the needs of the target population to the greatest extent possible, it is constructed in such a way as to fit in with the activities of the learners in order to ensure their regular attendance, as this would encourage them to stay in the system. This is why the weekly timetable varies between four and twenty hours, depending on the availability of the children, and with the agreement of their parents. The weekly day of rest and the school holidays are deliberately chosen to suit the activities of the learners and for climatic reasons. It is the school that reaches out to the learners, by taking into consideration their socio-cultural and socio-economic background, and not the other way round.

The outcome is that children without access to formal schooling can receive educational services of a good standard and therefore look forward to a better future. Thanks to the knowledge they have acquired, they can find a job, and even integrate or re-integrate into the educational circuit. This is a victory for the international community involved in non-formal education in general and literacy in particular.

http://w3.univ-tlse1.fr/LEREPS/

Partnership for Africa's Development (NEPAD) and the Africa Decade for Persons with Disabilities (1999–2009) all require governments to make new investments in education to ensure that all children attend and complete primary school. In addition to these initiatives, a multi-stakeholder body, the Association for the Development of Education in Africa (ADEA), consisting of African Ministries of Education, education-related international organizations in Africa, education specialists, researchers and development agencies, is working to support a regional movement for education by promoting a policy dialogue, developing partnerships and building national capacity to provide good quality education in Africa.

Nevertheless, it is necessary to bear an important factor in mind: this process of change in the area of education is slow. Rivalries between agendas frequently end in negative results in terms of achieving specific objectives. The development of inclusive education will not be possible until teachers start to acquire a better understanding of the way to teach different students. Teachers, too, need time to organize and perfect collaborative strategies for mutual assistance and the solution of problems. Assessment strategies must take into account the different strengths and needs of students, and the systems should be assessed not only on their success in teaching students with a strong propensity to study but all children as well.

It is not enough for funding agencies to identify programme components that can contribute to integrating disabled children into regular educational systems — even though this is, at least, a first step in the right direction. In addition, these agencies need to incorporate their concerns about disabled children with their other activities related to education. As long as multilateral institutions and major doors continue to contribute to education reforms that do not take into account children with disability, they actually contribute to a cycle of exclusion. Donors, governments, educators, organizations of disabled persons, and groups representing other excluded and marginalized children should unite to create collaborative approaches to implement a genuine inclusive education. We must give responsibility, confidence and resources to schools so that they can set in motion a process of solving problems and acquiring expertise. Investments in a few African countries could help to improve models that can be replicated all over the continent. For disabled persons to be included in education, it is necessary to invest not only in educational systems but also in families and communities. Early childhood education is necessary, and it is also important to eliminate stereotypes that result in numerous families hiding their disabled children.

People with disabilities, together with their families and their supporters, see education as the key to lives as full citizens of the future. Interest and openness towards the concept of inclusive education has grown, but this has been outside the central debates about education, where ultimately the concept of inclusion must be considered if it is to have any real chance of success. Inclusion needs to become central in policy and planning at all levels — from the local schools through Ministries of Education and multilateral, regional and international institutions. Consider children and youth with disabilities in all educational programmes, or they will always remain out of the education systems forever.

III-4. Specific programmes in higher education

Higher education has a vital role to play in strengthening the quality of education. Its task is to train teachers and ensure, through research centred on the context, the relevance of teacher training programmes, school programmes, outcomes of education systems, etc.

Higher education also plays an essential role in meeting many challenges, such as the armed conflicts faced by Sub-Saharan Africa. The Democratic Republic of Congo has pointed the way by incorporating compulsory modules on the prevention of armed conflicts that are common to all courses. The four modules, already mentioned above, concern (1) logic and argumentation, (2) general psychology, (3) the history of institutions of the Congo and (4) citizenship education. The general objectives that can be assigned to the last three modules have already been discussed. As for the first module (on logic and argumentation), its interest in higher education is obvious. The main objective would be to enable students to argue their point of view by adopting a critical spirit and by producing a written dissertation at bachelor's degree level after the first four years of higher studies. This exercise

prepares students for dissertations at the master's, doctorate and Ph.D. levels. If adopted by other countries in Sub-Saharan Africa, this innovation could be broadened, especially by incorporating the history of sub-regional and regional institutions.

On a different level, African universities and higher education institutions have their own challenges to face. These challenges concern the relevance of the courses available, the research undertaken and international visibility. African universities must not be cut off from the rest of the world; they need to develop along the same principles and requirements as universities and higher education institutions in the rest of the world. African universities should fulfil international standards by taking into account the liberalization of the education sector and the free competition that now characterizes it, the growing number of private higher education institutions, and the increasing trend to relocate universities from the North to the South. The rampant privatization of public higher education in numerous countries of Sub-Saharan Africa also obliges them to adopt strategic management practices and to achieve economic profitability. International comparisons between universities and higher education institutions all over the world oblige African universities to carry out their own renovation processes with a view to increasing their visibility and occupying a position in the international classifications of higher education structures.

In this regard, it is impossible to ignore the fact that African universities often are badly positioned, or even absent, in the classifications of the most frequently quoted systems of international comparisons, such as those of Berlin and Shanghai. The Berlin model, which can be consulted on the Webometrics site, explicitly states that "Africa was excluded for practical reasons" (http://www.webometrics.info/comparative_methodology.html). Even in the case of systems that take them into account, the African universities with the best ratings are below the 350th position. Among those that are included in these classifications, the top ten universities in Sub-Saharan Africa are all in South Africa. The Cheikh Anta Diop University occupied the 15th position among the top African universities in the June 2007 listing (http://www.socialcapitalgateway.org/fra-rankingafrica.htm (in French); http://www.webometrics.info/top100_continent.asp?cont=africa).

In-depth research should be devoted to the performances observed and to the absence of African universities in classifications based on international comparisons. In general, the criteria adopted by the Academic Ranking of World Universities of the Shanghai Jiao Tong University Institute of Higher Education (http://ed.sjtu.edu.cn/en/index.htm) and the Webometrics site of Berlin (http://www.webometrics.info/comparative_methodology.html) for international classifications are difficult to apply to African universities. On the other hand, there is a:

> *"classification of the best African universities by InternetLab (Observatorio de Ciencia y de la Technologie en Internet), a section of the Spanish Research Council. This classification is based on the quality indicators of the university websites, their size, their visibility on search engines, and the diversity of their content. The criteria shared by most international comparison systems relate to visibility. In this sense, the Internet (should now be) one of the fundamental means of disseminating knowledge, especially at academic level, and ... evaluations of university activities should take into account the capacity of universities to use the network for better visibility"* (http://www.socialcapitalgateway.org/fra-rankingafrica.htm; in French).

The universal nature of the most commonly used criteria, and the absence of African universities due to these evaluation mechanisms, means that intermediary systems for assessing African universities and higher education systems need to be adopted. Sall & Ndiaye (2007) propose a grid specially designed to fit the African context. Inspired by the Berlin and Shanghai models, the grid is composed of four dimensions and nine indicators:

1. Student/teacher exchanges: 25%
   Exchanges could be evaluated through the mobility of students and teachers:
   - The mobility indicator of students would relate to the number of students from one university attending another university outside the country to follow courses or undertake research activities, for a limited period.
   - The mobility indicator of teachers would relate to the number of visiting professors on mission in other

African universities outside the country.

2. Coordinated/concerted action on education/research: 25%
   This would be assessed on the basis of two indicators:
   - The complementary study programmes between two or several universities in two or several countries.
   - The existence of research projects jointly undertaken by two or several universities in two or more countries.
3. Communications in another language: 25%
   Scientific communications would be assessed according to a combination of three indicators:
   - The number of occasions on which teachers of one university participate in scientific events organized outside the country (seminars, conferences, etc).
   - The number of communications presented by teachers of one university in a different language from that of their university of origin.
   - Dissemination and accessibility of publications and research results through publication in sub-regional and regional journals.
4. Usefulness to the community: 25%
   Two indicators of usefulness to the community are put forward:
   - The number of teachers of a university directly involved in activities or services of an economic and social nature outside their university.
   - The number of times the findings of research carried out by a university are applied to activities and services outside that university.

The grid proposed by Sall is aimed mainly at introducing specific programmes to raise the quality of studies and research in higher education in Sub-Saharan Africa. It focuses on the criteria that could incite universities and higher education institutions to collaborate and co-operate more effectively. There no longer is any need to prove the urgency of joint programmes undertaken by several education and research institutions. For example, the Cheikh Anta Diop University of Dakar offers African and Africanist programmes and study modules to students in literature and the social sciences. These literature and history studies can be developed and broadened by other partner universities by encouraging greater mobility of students and teachers. Another example could involve French-speaking students who wish to specialize in English literature and civilization by following courses directly in the English-speaking countries of the continent (and the same could apply to students from English- and Portuguese-speaking countries).

The grid prepared by Sall also is designed to strengthen inter-university exchanges by organizing joint scientific events and publishing the proceedings in joint journals. The objective, in this case, is to reinforce or broaden certain co-operative measures that already exist. Thus, following the example of the Afro-American Study Days organized regularly at the Cheikh Anta Diop University in Dakar, universities in Sub-Saharan Africa could organize study days using the same model. Such events would create widely acknowledged centres of interest for the continent. In the case of publications, for instance, the journals of the Council for the Development of Social Science Research in Africa/CODESRIA (http://www.codesria.org) and the West African Society of Chemistry (http://www.sfc.fr/francophonie/plaquetteSoachim.PDF; in French) would benefit from a wider and better distribution.

Both the general and the specific programmes discussed above should be accompanied by pedagogical strategies conducive to their implementation.

IV. PEDAGOGY AND TEACHING METHODS

This part deals with issues relating to the size of classes and the way they function (IV-1) and to pedagogical methods and approaches (IV-2). Particular attention is paid to the negative effects of large, overcrowded classes on the outcomes and performances of school education. Teaching methods are being devised to make learners autonomous and free them from constraining supervision. Emphasis is placed on the direct motivation and involvement of the learners.

The role and place of pedagogy and teaching methods are well acknowledged. "What goes on in the classroom and the impact of the teacher and teaching has been identified by numerous studies as the crucial outcomes variable for improving learning. The way teachers teach is of critical

concern in any reform designed to improve quality" (UNESCO, 2004:152).

The way that learners learn, and the way in which they have learned to learn, are just as important for improving quality (Roegiers, 2000; Franay, Noël, Parmentier and Romainville, 1998; Baudrit 2007; Lebrun, 2002). The quality of education depends, to a great extent, on the methods used in the classroom, the relations between teachers and students, and the "close correspondence between the values and objectives" of teachers and pupils (UNESCO, 2004:228). It also depends on the size of the classes.

IV-1. Class size and modes of functioning

The size of classes and their modes of functioning are determined by political and economic factors. These factors are subject to numerous internal and external pressures. Among the internal pressures specific to each country, those exerted by demography, trade unions and the demand for education are significant. External pressures have been the same for all countries since the Jomtien Conference and Dakar Forum. All these pressures influence policies relating to the construction of schools, recruitment of teachers, purchase of school equipment, etc. The size of classes and effective modes of functioning depend directly on the number of schools and classrooms available, as well as the number of pupils and teachers.

The quality of teacher/pupil interactions, the frequency of homework, and the opportunities offered to students to discuss and exchange ideas in class depend on the number of pupils in the class. In other words, quality mainly is a function of the number of pupils in a class. The same applies to the organization and functioning of a class; teachers are reluctant to resort to active and participatory methods, and to divide pupils into small groups, when there are too many pupils for the space available.

It is not unusual to find classes of more than one-hundred pupils in primary schools in a town like Dakar. The same observation can be made about certain secondary schools. Overcrowding also is a constant handicap at the University of Dakar. This problem of overcrowding was a recurring theme of research on higher education during the 1990s. A review of these research studies was conducted in Dakar in 1995 during the International Pedagogical Days at the Ecole Normale Supérieure (Sall 1995).

It is generally acknowledged that the "impact of class size on pupil learning, when the range is between fifteen and thirty-five pupils, is different than when the upper limit is as high as 100, as in many developing countries" (UNESCO, 2004:67). Furthermore, the impact of class size is not the same when the teacher has to correct the homework of a hundred, or even a thousand pupils. The question of the time allotted for correcting homework and the relevant deliberations continues to be a major handicap suffered by the University of Dakar. The negative effect of class size on performance (UNESCO 2004:73), therefore, requires reducing teacher/pupil ratios. Solutions to this problem can be envisaged by exploring the possibilities offered by distance learning (see below).

As for the modes of functioning, several solutions have been tested in Senegal, with multi-grade or multi-level classes, two different streams attending two different teaching shifts, etc. When assessing the direct impact, other factors should be taken into account, including the effective number of teaching hours. In the case of Senegal, the adoption of these strategies, combined with a "continuous day" in the administrative section, seems to have reduced by half the average time spent learning at school, especially in elementary education.

Parallel to the mode of organization and functioning of education, the tacit liberation of the education sector has the effect of eliminating one day of study at all levels of education, especially in secondary school and higher education. Since teachers from the public sector are frequently in demand by private educational institutions, which are growing at a relatively fast rate, they often seem to be in a hurry to finish serving at their original public institution in order to sell their skills and experience to private establishments. These new practices have resulted in negative effects on several factors of schooling outcomes. Learners are increasingly subjected to timetables and pedagogical activities that are not compatible with the fixed school calendar and good assimilation of the contents taught.

The new behaviour patterns of teachers call for ethical solutions and new pedagogical approaches.

IV-2. Pedagogical methods and approaches

The pedagogical methods practiced by teachers depend largely on the class size. The advantage of direct participation by pupils in the learning process has been proved since the introduction of active methods based on established psychological and organizational knowledge. The merits and efficiency of the most commonly practiced pedagogical approaches and methods, such as structured teaching (UNESCO, 2004:154), outcome-oriented pedagogy and a competency based approach (Dolz and Ollagnier, 2002; Roegiers, 2000), frequently depend on the training received by teachers, their scholarly culture and their personality.

However, other approaches or methods are being developed or renewed, thanks to the cognitive sciences and computer technology. The same applies to co-operative learning (Baudrit, 2007), collaborative learning, open learning and discovery-based instruction (UNESCO, 2004:173; see also http://www.educnet.education.fr/dossier/eformation/modularite1.htm).

The main lesson to be learned from this profusion of pedagogical methods and approaches is to adopt one or several strategies that position the learner at the heart of the learning process. Teacher-dominated practices and lecture-driven methods must be abolished; learners should be at the centre of the learning process, and they should feel motivated and involved in their studies and education. At the same time, self-teaching and peer tutoring are highly recommended. These methods have the obvious advantage of developing a critical mind, a personal curiosity, a quest for knowledge and a spirit of initiative. By proceeding in this way, formal education can help to attenuate certain social practices that impose passive and submissive attitudes in African societies. Intellectual passiveness and socially acquired submission can have inhibiting effects on developing a critical mind.

However, pedagogical methods and strategies are feasible and efficient only if they are backed by adequate teaching materials, aids and equipment. They also require systemic approaches, as the Special United Nations Initiative for Africa seems to indicate:

> *"The successful experiences of rural schools show some or all or of these characteristics:*
> - *A "child-centred pedagogy" rather than a "teacher-focused approach": active teaching methods geared more towards learning than teaching;*
> - *Intensive co-operation between highly qualified teachers, less qualified teachers and community members and parents;*
> - *A continuing learning process grouping several levels combined and resources in the educational environment; older or quicker pupils helping the younger and weaker ones themselves or to work in small groups;*
> - *Ongoing regular training of teachers and mechanisms for mutual training and monitoring (among peers);*
> - *Use of technological resources for teaching: the use of distance learning, radio, and sometimes television courses;*
> - *Integrated follow-up and evaluation of student and teacher performance so as to help the schools learn from their own experiences;*
> - *Sustained relations between children and adults, through the interactive relationship between schools and local communities;*
> - *Participation of the community, parents and students in, among other things, the general orientation and management of the school and the development of materials;*
> - *Use of daily and weekly timetables and calendars of the school schedules adapted to local realities"*
>
> (UNSIA: http://www.uneca.org/unsia/publication/basicefr.pdf).

In short, pedagogical methods and approaches are strongly linked to two components: (1) the institutional factors falling within the scope of educational policies and (2) the training and professionalization of teachers. In general, current policies seem to focus on school enrolment rates — that is, on quantitative indicators rather than on qualitative indicators. But the latter are more sensitive to the relevance of education and, therefore, deserve special attention.

The professional skills displayed by teachers are promising signs of high school achievements. On the other hand, the massive recruitment of unqualified teachers as soon as

they leave primary school, or at the end of the first three or four years of secondary school, obviously has negative effects on pupil performance. Therefore, it is urgent to ensure that teachers have a perfect knowledge of the languages of instruction, to give them initial training in keeping with the level of education they will be teaching, and to offer them continuing education during their career. Economic profitability and an appropriate use of pedagogical equipment, often acquired at great cost, depend on satisfying these minimal conditions.

V. TEACHING AND TECHNOLOGICAL MATERIAL

This section deals with textbooks (V-1) and technologies (V-2). It envisages solutions to the shortage of books and examines information and communication technologies (ICT) that encompass computers and the Internet, radio, television, the written press, etc.

V-1. Textbooks and teaching aids

Of all the questions relating to teaching materials, the problem of textbooks and documentation is the most crucial one in Sub-Saharan Africa (see Box 7). In his review concerning textbooks, Kantabaze reveals a situation that seems to be unanimously acknowledged by researchers on education and international co-operation organizations. He refers to results showing that:

> *"In ten developing countries ... the relationship between mediocre results and the lack of school books was more significant and stronger than other variables, such as the qualifications of the teachers, the size of the classes ..."* (Kantabaze, 2005–2006:104).

He backs his point by quoting the World Bank:

> *"Research results agree in claiming that the supply of teaching materials, especially textbooks, is the most profitable way of improving the quality of primary education. The shortage of textbooks in African classes is a disturbing problem. It may be due to this factor that the gap has widened between this region and the rest of the world"* (Kantabaze 2005–2006:104).

The view of the World Bank was the object of a warning in UNESCO's EFA Global Monitoring Report on Education for 2005, which stresses that:

> *"Effective teaching and learning require wide and equitable availability of learning materials. In many countries, this is not the case. This situation calls for urgent attention, including rethinking of policies governing production and distribution of textbooks and other learning materials, and the training of teachers in how to use learning materials more effectively, in line with good teaching practice. For many countries, providing every pupil with a complete set of textbooks is only an ideal target"* (UNESCO, 2004:159).

The corroborating observations made by authors interested in the question of textbooks in Africa are accompanied by other comments that add to the problems facing schools in many Sub-Saharan countries. In fact, in addition to the shortage of books:

- The textbooks available on the international market for school programmes are not adapted to the contents and methods advocated by reforms in Africa.
- The cost is prohibitive for the great majority of households, with the rare imported textbooks still being useful.
- There are no authors and publishers of suitable textbooks, etc.

The situation is not as gloomy as it may seem. A growing number of countries (Benin, Senegal and others) have become aware of the importance of textbooks and have, in consequence, set up structures to produce and distribute them. However, these national efforts come up against several obstacles: problems relating to local authors of textbooks, their training, copyrights, etc. frequently remain unsolved. These issues usually result in weaknesses in the distributed products. The number and distribution of textbooks produced locally raise economic and financial problems for countries trying this out. The small size of national markets seems to act as a bottleneck for any vague intention to publish textbooks in Sub-Saharan Africa.

In view of this shortage, an alternative and provisional solution would be to request faculties of education and teacher training institutions to produce pedagogical documents. The former Ecole Normale Supérieure in Dakar produced and distributed pedagogical documents known as DOPEDOC that were highly appreciated by

teachers. It, therefore, possesses an expertise in this field that could be shared. Similarly, teachers should be trained to create pedagogical documents based on works that are accessible to them, such as press articles, pictures, etc. Another solution might be to download pedagogical resources from Internet. As UNESCO has pointed out: "Training in the use of newly introduced materials and continuous support to teachers should be an integral part of teaching and training materials development" (UNESCO, 2004:159).

V-2. ICT in Africa

A working document by the Coopération Française and the Ministry of Education in Senegal, Etat des lieux sur les TICE a Sénégal, describes the status of ICT in education in Senegal. A more ambitious study by Karsenti (2006), Agenda panafricain de recherche sur les usages pédagogiques des TIC, about a Pan-African research agenda on the pedagogical uses of ICT, was submitted to the International Development Research Centre (IDRC). In this study, Karsenti points out that "in several countries in Sub-Saharan Africa, there is a strong political will to introduce ICT in education. But national policies on ICT are not clearly formulated" (Karsenti, 2006).

Field research exists, along with programmatic views (see Boxes 8a and 8b). Between 1998 and 2002, a Canadian and a Senegalese researcher, Sall and Michaud, carried out research on the introduction of ICT in basic community schools and on raising the standard of learning (reading and writing, mathematics, hygiene, national languages, etc). Another objective was to explore the possibilities offered by ICT to ensure the functional literacy of adults,

Box 7: Abdoulaye Diagne (2006), Republic of Senegal, Ministry of Education, Department of Planning and Reform, Ten-year Programme for Education and Training (PDEF). Economic and Financial Report 2005. Provisional Report, Dakar: Consortium for Economic and Social Research (CRES), 18 April 2006, p. 34.

4.1. AVAILABILITY OF TEXTBOOKS

The number of books per pupil is far from reaching the objectives set for the second phase of the PDEF. The Letter on general policy for the education and training sector reckons that the pupils of the CI/.CP classes should have two books each, while those in the other elementary classes should have five. These ratios should be reached in 2007. In 2005, the average ratio was 1.3 per pupil (table 37a). If the number of textbooks available per discipline is examined, it will be noted that although nearly seven children out of ten have a reading book, only five and two pupils respectively have a textbook on maths and a textbook on science. The situation prevailing in 2005 is hardly better than in 2002 when the average ratio was 1.2 books per pupil. The availability of textbooks per discipline has not changed significantly either, since slightly over six out of ten children had a reading book, three out of ten a maths book and two out of ten a science book. In fact ... only the year 2003 recorded an improvement, with an average ratio of 1.6 books per pupil. But the fact that no books were acquired the following years lowered this ratio. On the whole, it can be considered that access to textbooks continues to be difficult for pupils despite the significant increases in public expenditure allocated to the education sector (see Section VI). In reality, all the research on developing countries confirms the crucial role played by books in improving the learning achievements of pupils.

The findings of research carried out on the Senegalese educational system (Section V) stresses the very positive influence of textbooks on the cognitive skills achieved by pupils. Furthermore, priority should be given to free textbooks as one of the strategies to attract the children of poor families who are at present excluded from school mainly for economic reasons, as revealed by the Report on the Analysis of the Education Sector (Ministry of Education, 2004). Finally, the free distribution of schoolbooks in 2005 was favourably received by all parents of pupils, and was considered to be an indicator of the positive changes that the PDEF had started to introduce in the education sector. It is highly regrettable that this factor of attracting populations to the Programme has been neglected, especially since budgetary constraints were not put forward as a justification.

The situation is hardly better in middle school. Each pupil should have a minimum of five schoolbooks, but on average, three pupils had to share two books. This ratio is much higher than for previous years. In 2003, there was only one book for three pupils and less than one book for three pupils in 2004. The doubling of the ratio between 2004 and 2005 can be explained by the acquisition of 764,847 textbooks for teaching middle and secondary school classes, which was financed by IDA. The absence of grants for middle school textbooks in 2005 and 2006 means that the ratio achieved in 2004 will fall for at least the next two years.

especially women (Sall, 1993, 2001, 2006; Sall and Michaud, 2002a, 2002b; Michaud and Sall, 2005). The plan was to introduce media-covered teaching based on classroom lessons and distance learning, under the most typical conditions prevailing in many Sub-Saharan countries, in deprived peri-urban and rural areas lacking electricity and telephone lines, etc.

Research like that carried out by Sall and Michaud clearly pinpoints the conditions and ways to introduce ICT on a relatively large scale in the education systems of poor areas. These studies insist on strategies to train teachers on how to make use of the advantages offered by ICT, their involvement in the design of the contents to be placed on line and in the educational system, as well as strategies to ensure their perpetuation and appropriation by the beneficiary communities, etc. This research also has the merit of having fully explored the possibilities of distance learning.

The search for a solution to equip schools with computers, to train teachers and to show learners how to use the resources available on Internet for educational purposes lies at the heart of the Sénéclic Project (Wal Fadjri, 4/8/2007; Lambey, May 2007; Wade; Le Soleil). According to Claude Lambey, Director of the ICT Department of Besançon, the following progress was made in the education sector:

- *"23 schools set up so far, with 500 computers, 1000 PCs planned for the end of 2007*
- *Construction of an establishment for the handicapped*
- *7 people recruited for the Sénéclic Unit*
- *Acquisition of cleaning material, recycling of PCs under way*
- *Start up of the workshop at the end of 2007" (Lambey, 2007).*

Information and communication technologies are major assets for the diversification of sources of documentation on pedagogical and learning technologies. Distance education is one of the most promising technological resources available. Used judiciously, it will improve the quality of education in Sub-Saharan Africa. Being multi-form by definition, exploring the opportunities provided by distance education would improve the questions of access to education, teacher training, handling large groups, etc.

A large number of Sub-Saharan countries are not impervious to the lure of distance education. Among the initiatives that are being developed are Coselearn (http://www.coselearn.org); Association of Francophone Universities/AUF (http://foad.refer.org); UN Special Initiative for Africa (http://www.unisa.ac.za); Kenyatta University, Kenya (http://www.ku.ac.ke); and Makerere University, Uganda (http://mak.ac.ug/makerere).

The most recent initiatives in Senegal include:

- the web site http://examen.sn, designed to help learners prepare for their end-of-cycle exams, from the end of primary school to secondary school, with a pedagogical assistance service for learners;
- the web site http://www.volontaires.sn, intended for the distance training of education volunteers; and
- the web site http://www.fastef-portedu.ucad.sn, a database for researchers in the field of education.

Following the example of the African Virtual University (http://www.avu.org), distance education is developing increasingly, especially in the area of higher education. Thanks to the resources of distance education, the School of Librarians, Archivists and Documentalists of the Cheikh Anta Diop University in Dakar offers distance learning courses in many African countries (as far as Madagascar). Following this example, the Faculty of the Sciences and Technologies of Education and Training at the Cheikh Anta Diop University provides a master's course in distance management, evaluation and piloting of education systems. This programme is being developed in partnership with the Dakar Pole for the sectoral analysis of education (http://www.poledakar.org).

The examples mentioned encourage all parties concerned to search for synergies between the institutions and countries in which they are being developed. As an extension of the initiative of the Digital Solidarity Fund, or within the framework of broadened co-operative actions, distance education offers numerous opportunities for exchanges and co-operation among countries in Sub-Saharan Africa. Some of these countries have easy access to satellites, or possess their own. These countries can

place such resources at the disposal of education in Sub-Saharan Africa to renovate and revitalize it, and to raise the standard of teaching and training. This sharing process, however, requires a more effective framework for co-operation and exchanges.

The advantages offered by ICT to education are not restricted to computers; hence, the concept of ICT at the service of information and communication technologies for education (ICTE). Pedagogical applications can also be derived from the possibilities offered by FM radio or television broadcasts.

> *"Radio and television broadcasting has not been eclipsed by computers, and both radio and television continue to be used in classes. A series of teaching projects by radio, based on the active participation of pupils in the classroom, in response to questions asked by the teacher over radio, has been implemented in many countries in the world, and has obtained interesting results from the point of view of learning. (...) Radio can enrich and maximise basic education services at a much lower cost than television or computers"*
> (Hilary Perraton and Charlotte Creed, February 2000, http://www2.unesco.org/wef/fr-leadup/fr_findings_ techno.shtm; in French).

Several African countries, especially those belonging to the Community of Learning (CAL), have acquired useful experiences that they can share. The Soul Buddyz experience, undertaken in Africa for the prevention of HIV/AIDS, clearly shows the advantages that can be derived from the combination and profile of televised series, the written and spoken press, the theatre, etc. (World Bank, 2004:47–75).

Lessons can be learned from the past. Based on the experiences of the 1960s with school radio and television in countries such as Niger, Côte d'Ivoire and Senegal, education systems in Sub-Saharan Africa should take into account the renewed interest they arouse and the possibilities of improving education both in terms of quantity and quality (see above, the successful experience reported by UNSIA). Whatever the technological option chosen by a country or group of countries, pedagogical equipment and teaching materials should be robust and adapted to the environmental context, the pedagogical objectives, etc. Beneficiary countries should be capable of maintaining and repairing school equipment and teaching materials in the surrounding schools. Ideally, the communities in question should have the ingenuity required to produce some of the material needed for educational purposes. Teachers should receive the necessary training for the conception, maintenance and repair of teaching materials and pedagogical equipment used in their school and classes

To summarize, technology offers a large number of solutions to the problems afflicting education in Sub-Saharan Africa. All the initiatives that can be recommended imply the adoption of inventive policies. Customs and taxation policies should be adjusted to facilitate the imports of products, materials and equipment for schools and educational structures. The same applies to access to the Internet, and telephone and electricity connections. Preferential tariffs would appear to be the sine qua non condition for achieving the eight Millennium Development Goals by the deadline. (http://portal.unesco.org/education/).

Each of the objectives identified in the MDGs — 1. To eradicate extreme poverty; 2. To achieve universal primary education; 3. To promote gender equality and empower women; 4. To reduce child mortality; 5. To improve maternal health; 6. To combat HIV/AIDS, malaria and other diseases; 7. To ensure environmental sustainability; and 8. To create a global partnership for development — requires specific educational action. In particular, although enrolling children in school is only part of the solution, achieving Goal 2 requires fresh views and a renewed political will on the part of all countries in Sub-Saharan Africa (http://www.un.org/french/millenniumgoals/goal2.pdf; in French).

Box 8a: ICT and Education

A. Depover, C. (2006). Conception and management of curriculum reforms, Paris: UNESCO ED/EPS/2006/PI/18, March 2005, pp. 51-52.

Should provisions be made for a course on information and communication technologies (ICT) in the curricula for general education?

When the head of an education system decides to release funds to equip schools with computers, the most obvious starting point is usually to create a course initiating students into technologies, first for certain specialised professional sectors and then for all pupils attending secondary school, and even at the end of primary school. This is a highly commendable approach but it now seems to be a little obsolete.

In reality, the countries that launched ambitious plans for technological equipment at the end of the 1990s have gradually abandoned this approach, described as horizontal, in favour of a vertical one based on plans to incorporate ICT in various disciplines. Incorporating ICT in the various disciplines is, in fact, better suited to the current uses of computers and new technologies that now belong not only to the domain of experts (computer technicians) but also fall within the competence of all well-informed professionals.

The aim, therefore, is to show pupils how to use the tools placed at their disposal by ICT to serve as an aid for developing new skills through all components of the curriculum and not just through one particular discipline. This approach to introducing ICT in the education system also has the advantage of bringing the different disciplines closer together on the basis of a common use of certain software. A spreadsheet, for instance, can easily be used to bring together or to structure data for the classes of mathematics and science, but also for history, geography or the first language.

Admittedly, this type of approach is often more difficult to implement than the one based on a horizontal organisation. However, it should be borne in mind that it would contribute more to the development of the skills expected from the younger generations that will belong to an increasingly technological world.

http://unesdoc.unesco.org/images/0015/001511/151154f.pdf

B. Inclusion of ICT in education in West and Central Africa (Phase II): Research-action training of teachers incorporating ICT in their teaching practices Mali > Lyçée Koné Danzié in Koutiala.

DESCRIPTION OF THE SCHOOL

The Koné Danzié Lyçée of Koutiala, established in1994, is a secondary school. Since 1999, the administration uses computers thanks to a twinning operation between Koutiala and Alençon in France. Recently, the school has been equipped with a computer room containing twenty machines, six of which are connected to Internet. These computers were supplied by the Ministry of National Education (6), World Links (4) and Schoolnet (10).

PRESENTATION OF THE SELECTED PEDAGOGICAL PROJECT

The project consists in forming a Klanetdanzié Internet club composed of learning groups in the following disciplines: German, Biology, French, Mathematics and Physics.

The objectives of this project are to improve the quality of teaching through the introduction of ICT, diversify the pedagogical practices of teachers, incorporate in pedagogical strategies the teaching experiences of other education systems by fostering an open outlook towards the external world, and elaborate and propose pedagogical innovations to political decision-makers with a view to reforming education (especially educational programmes).

http://www.afriquetic.org/m_ldkk.php (in French)

Box 8b: ICT and Education

SENEGAL: DIGITAL SOLIDARITY – A PLATFORM FOR BASIC DEVELOPMENT

Wal Fadjri (Dakar), 4 August 2007. Published on the Web on 6 August 2007
Cheik Yero Kaba

Yesterday, the Digital Solidarity Unit at the Palais de la République (Seneclic) and the Iseg/Cesmi Group signed an agreement on the emergence of digital towns in Africa.

The ceremony took place in the presence of officials from the local authorities and associations of artisans of Senegal. These organisations intend to work together to ensure that the information society is open to all citizens.

Seneclic, the Multimedia and Internet Centre (Cesmi), and other sectors signed a protocol agreement on the emergence of digital towns. The main purpose of this agreement is to reduce the digital divide. As a first step, 23 schools have been erected and over 300 teachers trained. In addition, other centres are in the process of being constructed within the Lyçée Kennedy. Under the terms of this agreement, the handicapped have not been neglected because, as Mamadou Diop, Chairman of the Iseg/Cesmi Group, declared, this social category also has the right to be trained to lead an active life in an operational manner. The President of the Union of the Association of Local Elected Representatives, Alé Lô, pointed out that this initiative is in keeping with the view of the Head of State who believes that Africa can only develop by teaching children information and communication technologies.

http://fr.allafrica.com/stories/200708060377.html (in French)

COMPUTER SCIENCE: ABOUT TWENTY TEACHERS TRAINED IN RUFISQUE

Source: Le Soleil

The introduction of the Seneclic system, a partnership between Senegalese schools and the town of Besançon, aimed at reducing the digital divide by giving pupils attending primary schools in Senegal computer equipment of good quality, continues to make good progress. In Rufisque, about twenty teachers at the Camp Marchand School participated in a training session on the use of this tool in the education system.

These teachers have been trained to acquire skills in the area of computer science so that they can in turn pass them on to their pupils. This was the purpose of the seminar, held at the Camp Marchand School in Rufisque, for teachers from this town, as well as from Thiaroye, Bargny and Thiès nearby.

Co-ordinated by Rémy Petit, pedagogical counsellor of the town of Besançon in France, and in the presence of Mbagnick Socé, co-ordinator of the pedagogical committee of the Seneclic unit, also an education inspector, this seminar provided an opportunity to become familiar with computer tools, especially the different types of software that can serve as teaching aids in the conception of lessons. This software, noted Rémy Petit, is conceived jointly by a team of programmers and a pedagogical team. There are several of them, especially for the use of basic functions. They range from mental calculation to learning how to read, and include freehand sketching. Hence the relevance of their use in the education system, especially in the Senegalese primary schools that will benefit from them in the very near future.

Rémy Petit stressed that the Senegalese government is focusing its efforts on infrastructures, through secure computer rooms equipped with ADSL telephone lines of a high standard. "It is clear that everything has been taken care of in the start-up phase. The staff are already at work", he announced.

http://www.rufisquenews.com/

VI. CONCLUSIONS

The implementation of all these studies on innovation with a view to revitalizing and strengthening the quality of education in Sub-Saharan Africa seems to call for adopting a systemic approach. The studies conducted on policies, teacher training, research, programmes, teaching methods and pedagogical materials constitute a whole, and form the foundation for establishing a consistent national system of education. They call for each country to look upon education as a global system that gives meaning to the sub-systems comprising it. By adopting a systemic approach, each of the different parts of the study has a retroactive effect on the others, and is closely dependent on them.

Pedagogical programmes and materials are of particular concern; they cannot, strictly speaking, be conceived or implemented separately from policies on education and teacher training, since it is these policies that make it possible to transform intentions into concrete achievements. Attention also should be drawn to the gaps usually observed between the prescribed programmes, the programmes planned by teachers for application in their class and the programmes actually taught. These gaps are due to the unavoidable corrections and adjustments that teachers are obliged to make in class. Teachers need to adapt to the learners in their class just as much as they need to adjust to specific teaching situations — in other words, a learning process that depends on the heterogeneity, level and speed of assimilation of the pupils in a class.

Similarly, the concept of a "programme", as it frequently appears in the study, should be understood as a curriculum that can be founded on a more systemic approach. Curricula, too, should be based on skills trees and on interdisciplinary approaches that are not separated into segments (as often is the case in education). In this respect, knowledge of the language or languages of instruction is a precondition for dispensing education of a high standard, facilitating understanding by the learners, and achieving the objectives fixed by the teaching of science in general, and of mathematics in particular.

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