

# ICT for quality education: Lessons from pioneering schools in Africa



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Karsenti, T., Touré, K., Tchameni Ngamo, S. & Villeneuve, S. (2008). ICT for quality education: Lessons from pioneering schools in Africa. In K. McFerrin et al. (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2008* (pp. 2339-2341). Chesapeake, VA: AACE.

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## Conference Information



**Society for Information Technology & Teacher  
Education International Conference (SITE)  
2008**

Las Vegas, Nevada, USA

March 3, 2008

ISBN 1-880094-64-9

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AACE

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## Abstract

This research presents an overview of an extensive research effort carried out in five sub-Saharan African countries (Benin, Ghana, Cameroon, Mali and Senegal). It shows how African schools are striving to integrate ICT into education systems, one step at a time, so they can take their place among an international learning network, among the thousands of

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## ***ICT for quality education: Lessons from pioneering schools in Africa***

Africa: 54 countries, 3,000 languages, 900 million people, 18,000,000 students to be trained by 2015, and much economic ground lost. What a colossal challenge for the education system! Can ICT help meet these challenges? This is exactly what we will attempt to demonstrate in this presentation. With a balanced approach and supporting research results, this presentation will portray an overview of the key findings of one of the largest research projects ever conducted on ICT in African education, against all odds. Some 66,000 students, 3,000 teachers, 50 headmasters and headmistresses, and 150 school administrators in Benin, Cameroon, Ghana, Mali and Senegal took part in this project, along with 30 researchers and researchers-in-training.

The aim of this research was to investigate a range of African schools that were using ICT, known as pioneer schools. They were among the first to take on the challenges of technology, despite countless obstacles. Unlike many recent studies and international initiatives in Africa, we did not set out to confirm the pessimistic predictions of René Dumont<sup>1</sup>, presented over 40 years ago in his work *False Start in Africa*. Instead, and for once, we wanted find out what has been done well in Africa!

The idea was not to mask the real situation on the African continent, which would only serve to reinforce pessimistic views. It is true that Africa faces enormous obstacles, including a population explosion, insufficiently qualified or unqualified teachers, high illiteracy rates, pervasive poverty and health problems, and socioeconomic disparities. And until very recently, the development and integration of information and communications technologies (ICT) have not been major priorities or even concerns for the organizers of forums on “important” African issues. In this long road towards development, described by Dumont and others as a “false start,” we wanted to show that technologies hold the promise that at the end of the day, Africa can dare to hope and dream, and can join the global village envisaged by MacLuhan, and maybe start to think about ICT for quality education in the 21<sup>st</sup> century.

This research presents an overview of an extensive research effort carried out in five sub-Saharan African countries (Benin, Ghana, Cameroon, Mali and Senegal). It shows how African schools are striving to integrate ICT into education systems, one step at a time, so they can take their place among an international learning network, among the thousands of educational institutions worldwide where ICT have been entrenched. We illustrate how many schools are phasing in practical uses of the Internet by teachers and students. And, through multimedia centres, computer labs and cyber cafés, they have even broken new ground and developed innovative adaptations for particular situations.

Regardless of the amount of computer equipment, Internet connections or sporadic use of ICT in the schools, the key challenge remains to achieve regular pedagogical use of these technologies to improve the quality of teaching and learning. Indeed, there is evidence of a shift of paradigm in African schools : from *teachability* to *learnability*.

This research initiative was a unique pioneer experiment in an African context, carried out in cooperation with African pioneer schools. It showcases the current pedagogical situation in Africa and demonstrates that it is not disastrous. Rather, it calls for optimism and a joint exploration of fund-raising with current or potential partners (NGOs and financial backers) to more effectively support initiatives and conditions for pedagogical integration of ICT in other African schools. This also raises the key role of governments with regard to supporting in various ways ICT-related initiatives.

The present research builds on the results of a transnational research project on *ICT Integration in Education in West and Central Africa: Case Studies of Pioneer Schools* (Benin, Cameroon, Ghana, Mali and Senegal). This study, using a mixed methodology combining qualitative and quantitative

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<sup>1</sup> Dumont, René (1962). *L'Afrique noire est mal partie*. Paris, Éditions du Seuil. English trans., *False Start in Africa*.

approaches, the first of its kind in Africa, was designed to improve our understanding of the pedagogical uses of ICT in the African sociocultural context, with a focus on the critical issues of technology access, uses, effects and durability in the educational system.

*ICT for quality education in the 21st century: Lessons from pioneering schools in Africa* aims to make an extremely important contribution, particularly in Africa, where the literature review reveals that not much has been written on this issue. The general research objective was therefore to better understand, in an African context, the conditions for successful ICT integration into teaching and learning in order to significantly improve the quality of education and its development.

Thus, the research aimed to identify the conditions likely to foster successful integration of ICT into selected pioneer schools in order to make a significant contribution to improve and develop the educational system. To achieve these objectives, this international research effort adopted a mixed, primarily qualitative methodology, using multi-case studies conducted in primary and secondary African schools. In general, participating countries selected eight schools each for the case studies, for a total of 36 schools. Compiling the experiences of the main school actors—the headmasters/headmistresses and/or the administrative staff as well as the teachers, students and parents—the research reported on classroom observations, interviews, questionnaires and analyses of diverse documents. In all, 66,000 students and 3,000 teachers participated in the research (all methodological details will later be addressed in the detailed paper).

Information and communication technologies (ICT) have resulted from a convergence of innovative advances in the areas of science, information techniques and technologies, electronics and telecommunications. Through a harmonious combination of all these disciplines, information is processed, stored, searched and distributed as text, sound or image. In other words, ICT are a set of technologies used to process, modify and exchange information. ICT holds a vast potential for practical application and implementation. For instance, the video is an efficient, sophisticated use of audiovisual technology. Technological tools can also create an environment for creative ICT development. Thus, the computer and the Internet are the means of choice for teaching and learning, as they offer a wide variety of applications in pedagogical practice. ICT, constantly in flux, are present in all spheres of human activity today.

In a world that is increasingly dominated by technological progress in all sectors of society, quality education demands energetic and innovative explorations of ICT so as to better leverage its potential. In this perspective, we need to focus on national and international partnerships so we can develop ICT and properly equip the educational institutions. Accordingly, there is an urgent need to re-conceptualize and restructure educational systems so they may better cope with the technological challenges to come in this century.

Information and communication technologies are the engines of major changes in economic, social and cultural patterns around the world. With the arrival of electronic media, we are seeing radical transformations in the ways that people acquire knowledge and approach learning. The rapid changes and innovations in society and industry require new learning paradigms. Duly mastered and correctly applied, these new learning methods can simplify educational systems and enable them to evolve with the times, in pace with technological advances. They empower people to teach and learn, they bring hope, and they provide the most effective training to the greatest number of people.

The results address different themes, but all center on the day-to-day lives of African schools that either hope to integrate ICT in their curricula or have already incorporated them to varying extents. The ICT integration process differs across countries and even between schools within a country. The absence of established policies for ICT integration in schools emerges as a key barrier to the successful and sustained use of ICT. The results show that ICT are used for various teaching methods, with Web sites and interactive CD-ROMs for learning and the computer for presentations and Internet research. Certain results point out the negative effects of ICT integration in teaching, such as poor or inadequate ICT time allocation, excessively zealous ICT use by some students, loss of interest in reading and writing, and increased interest in pornography, which ultimately lead

to a more restricted use of ICT for teaching and learning purposes. However, the positive appears to far outweigh the negative. Among the positive effects of ICT is the greater interaction between teachers and students and among students themselves, who are increasingly engaged in independent knowledge seeking.

The results also testify to the many limiting factors such as lack of equipment, lack of suitable content for the environment, and lack of teacher training in the pedagogical use of ICT, which is vital for real ICT integration into education, and which represents a colossal challenge. We note, for example, that although the students have access to computers at school, the actual number of computers is woefully insufficient for the number of students and teachers, and computer/student ratios are very unsatisfactory. As for the sustainability of ICT integration in the schools, the results also highlight challenges common to all the schools studied: high maintenance and service costs for computers, recurrent power blackouts and poor telecommunications networks. Nevertheless, a good number of teachers and students are not held back by these arguments, and persist in using Internet searches to resolve teaching and learning problems.

Finally, suggestions and recommendations are put forward for teachers, for teacher trainers, to researchers, the governments of the countries, the schools and their partners. Among the recommendations are that access to computers should be improved and teachers should acquire both the technical and pedagogical qualifications to make the best use of ICT in teaching and learning. A critical issue is the need for improvements to the overall educational system, going beyond conventional theoretical approaches to a more integrated vision of ICT problem solving tools. As practical teaching and learning tools, ICT would help Africa overcome contemporary problems in its quest for educational and social development.