

African Union honors outstanding African scientists through the Kwame Nkrumah Scientific Awards



ADEA COMED News Journal - January - February 2014 N°6

# edueACTION frica news

The News Journal of the ADEA Working Group on Communication for Education and Development

## Editorial

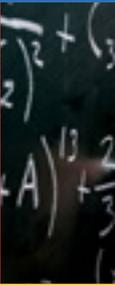


Science and Mathematics Education in Africa



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African Institute for Mathematical Sciences  
NEXT EINSTEIN INITIATIVE

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## Science and Mathematics Education in Africa

By Lawalley Cole,  
Coordinator, WG COMED



In this second decade of the 21st century, the African continent continues to enjoy an impressive growth rate with economies growing faster than those of almost any other region in the world. There are at least a dozen countries in sub-Saharan Africa that have been expanding by more than 6% a year during the past six years or more. According to the World Bank, much of this growth has not been translated into prosperity for the African masses. Recently, the public conversation about Africa has focused mostly on issues bordering on governance, accountability and transparency in political and business leadership. Of course, these are extremely crucial. However, these cannot be fully achieved if the questions of education and skills development and ethics on the continent are not adequately addressed. There is a strong correlation between quality education, skills development and good governance, accountability and transparency in politics and economic and social development. In particular, we need to think more about instituting science, mathematics and technology education that is African born and which can have the ability to compare and compete with the rest of the world.

As the rest of the world continues to enjoy shifts of changes in science and technology, and in organizational principles, as well as invention of new goods and services in different forms of social development, Africa has been rather slow in responding well to such transformations. They will typically entail the acquisition of capabilities to respond positively and timely to the challenges and opportunities the changes generated. They will also mean that one should be able to predict and prepare for future adjustments, with new challenges and opportunities. For several reasons, Africa failed to participate in the changes and exchanges in the global market-places of goods and services, and of ideas and new ways of doing things. The aggregate consequences of

the inability or unwillingness to respond to changes have to some considerable extent tended to isolate Africa and Africans from major global events. Africa became increasingly isolated, and then stopped to be an active participant in the global market place and instead became the victim of changes and challenges taking place at the global level. As a matter of fact, the continent is fast becoming a recipient of other peoples' ideas and ways of doing things, and of their goods and services. The capabilities of Africans to respond to the global changes, challenges, possibilities and opportunities as the 21st century unfold will determine their survival as distinct people with their own cultures and civilization conditions to enjoy, nourish, promote and defend. Here, we must emphasize the importance of widespread education at the continental level, and especially in the areas of mathematics, science and technology.

For decades now, Africans have recognized science, mathematics and technology to be the foundation of development and prosperity of the continent. Without the skillful utilization and management of science and technology, African countries will not be able to witness full economic prosperity. The continent, therefore, needs skilled human resources in the areas of science, mathematics and technology.

Africa's negative image as a continent in deep troubles and of its peoples portrayed as people unable to solve their problems is distressing. These images can be challenged through education, especially again in mathematics, science and technology education that emphasize scientific and technological skills development. Failure to challenge them may not only continue to mislead the rest of the world, but may, more seriously, cause young Africans to doubt their own capabilities and self-esteem. This can undermine their role as levers of change for an alternative better future for the continent. Africans

# Editorial

must begin to build the requisite capabilities in mathematics, science and technology to respond to the necessary changes. Otherwise the marginalization of Africa from major world activities, like business and politics, science and technology, would accelerate.

In general, science and mathematics education can play a significant role in the development of an individual and a nation. The values, ethos, practices and perspective of science for interpreting nature are a part of science education. If current developments occurring around the world are anything to go by, globalization with its attendant economic, political, social and other spin-offs, together with the phenomenal development in telecommunications, communications technology and computer technology are already affecting every person living on the globe in this twenty-first century. To understand, appreciate and efficiently use all these developments for meaningful learning, scientific culture must permeate the society and the everyday thoughts and actions of ordinary people. For the developing countries of Africa that have been dominated and governed by non-western sociocultural factors, western science can mean an imposition of one culture over another. It means the replacement of the anthropomorphic worldview with a mechanistic one. This situation, amongst many others, would further militate against the race to the development by African nations. When we examine the advent of science into Africa, the current state of school science in Africa and look again at the possibilities for and implications of, harnessing traditional African thought system and Western science to develop an effective culture for Africa of the twenty-first century, we realize that there is much more that remains to be done.

Today, the general notion that Africa trails behind other continents in terms of provision of science and mathematics education for girls appear to be dwindling, despite the fact that the benefits of science and mathematics education are more numerous for women in some major parts of the world enjoying sustainable social and economic development. In the recent past, female education and training in Africa was generally characterized by lower performance and achievement levels than those of boys, especially in mathematics, science and other technical subjects, but this seems to be changing nowadays with girls topping in science classes in many secondary schools and other institutions of higher learning across the continent. This is good news.

For Africa to be able to compete on the global scene, science and technology are vitally important. The teaching of science and mathematics must, therefore, be encouraged at all levels of our education systems in Africa. There should be adequate collaboration to support all sub-sectors of the education systems in Africa, and especially to enhance the teaching of maths, science and technical subjects at the secondary level.

Africa should continue to put emphasis on building local capacity while not dismissing development of viable partnerships in science and mathematics education. Issues regarding sustainability and the creation of a critical mass of local expertise are a pivotal step in the right direction. The rationale for this development is that a strong and vibrant community of researchers and curriculum specialists at this level is key to the continued development and improvement of basic science and mathematics education.

# The Interview



## M.Thierry ZOMAHOUN executive director of AIMS

"African Institute for Mathematical Sciences".

*Lawalley Cole: Hello Mr. Zomahoun*

Thierry Zomahoun: Bonjour

*L. C.: You are the executive director of AIMS.*

T. Z.: AIMS "African Institute for Mathematical Sciences".

*L. C.: You are based in Johannesburg...*

T. Z.: In Cape Town.

*L. C. : In Cape Town, in South Africa. Can you tell us a little about what AIMS is currently doing for the African continent?*

T. Z.: AIMS, as you said, is the African Institute for Mathematical Sciences. It is an initiative that was launched a decade ago in South Africa. It is therefore an African initiative, promoted by Africans, to lead the transformation of the African continent through innovative scientific training, scientific research and a systematic engagement of the public in the mathematical sciences. We created our first center of excellence in South Africa, a center for training university students in the field of mathematical sciences, by which we mean any field having a mathematical nature, a specificity, that is, math itself, physics, chemistry, econometrics, statistics, etc.

We are therefore a pan-African network of centers of excellence that work to promote high-level cutting-edge scientific training, to teach the sciences differently, mathematical sciences in particular, which attack the problems and challenges that Africa faces.

We train the most brilliant young mathematicians



from the African continent in our centers of excellence so that these young people are capable of providing concrete solutions to the development problems that the African continent is experiencing. We launched this first center 10 years ago and three years ago, the second center in Senegal. The third center was created in Ghana and the fourth center of excellence opened last year, in 2013, in Cameroon. Our ambition is to launch 15 centers of excellence in 15 countries on the African continent.

*L. C.: Will the Arabic-speaking countries, the North African countries, be involved?*

T. Z.: The countries of North Africa will be involved. The reason why we want to include 15 countries in this network is because if we want Africa to best profit from these natural resources, if we want Africa to develop, if we want Africa to compete on the same level as the other continents and regions in the world, if we want Africa to be respected and strategically position itself in this globalized economy of the 21st century, Africa must develop its scientific and technical capacities and competencies. And therefore, to answer your question more precisely, I will say that we plan to extend these centers of excellence to the countries of North Africa. We have 15 countries on our agenda and we want the geographic balance of the continent to be respected, that is, North African countries, but also West African, Central African and East African countries, to permit the entire continent to benefit to the maximum from the AIMS transformative factor.

*L. C.: You said that that there was in the*

*past, and there is right now, a lot of conflict in Africa. There are politicians, other rebel movements, people who have really used crime for their own purposes to cause damage in their country. Now that AIMS exists, is there a specific project for the vulnerable countries, for example, the countries that have lived through war such as Liberia, Burundi, for example, and other countries like Sudan, South Sudan. What are your projects? Do you have specific ones for them?*

T. Z.: I must say first, if you will permit me, that what certain regions and parts of our continent are going through is very distressing, for example, the conflicts that you see in certain countries that you mentioned. What we have seen in Niger, in Burundi and now in Central African Republic, right as we speak, is very distressing and in most cases, young people are involved in these conflicts. They are an easy prey for recruiters, warlords, certainly but also because they are a vulnerable stratum, which is sometimes not absorbed in any education system, be it a basic education system or a more advanced one. Consequently, they are dropped, youth is left to its own devices and becomes a fertile breeding ground for labor or recruitment for certain ill-intentioned people. What we are doing, creating and developing a center of excellence in a country, requires a minimum of stability. You know that we need stability, peace, to promote sustainable development.

And when you look at the concept of centers of excellence, which create high-level training, cutting-edge scientific research, this can only take place in a context of stability, a democratic context, a context of opening. This is because you have a center of excellence that attracts resources and expertise from the entire world, you have the leading experts of the scientific world who come from the four corners of the planet and you want people to do science in a climate of security.

For the moment, certain countries still do not meet these criteria, but what we are doing today is permitting these countries to use satellite zones with centers of excellence that are already in countries of the subregion. Take a country like Cameroon where we have a high-level center of excellence and around it are countries like Central African Republic, Chad and Gabon. We have Central African Republic students in our centers of excellence so that their country can

benefit from what we do, from the scientific research that is produced in Cameroon until this country's situation stabilizes. Without forgetting that at this moment the young people in our centers of excellence, what AIMS, the African Institute of Mathematical Sciences, is doing, is also helping to guarantee that what we are going through in Africa today will not be reproduced. We are aiding young people from several countries to get to know themselves, to sit down around the same table, to take their courses together, to talk to each other, to transcend their cultural, ethnic and geographic divergences. You see a Central African Republic student who takes a high-level course in the same center of excellence as a Cameroonian and Gabonese student.

We are in the process of training a new generation, not only of scientists, but of African citizens, African leaders who will head our nations and who are going to learn to not make war, to not tear each other apart, but rather to promote their country's development through the continent's scientific and technical transformation, because that is what they have been trained to do.

Therefore, if you like, AIMS is doing work whose repercussions will cover the scientific field, but also the political field, region and national governance and also peace and the nations' security.

*L. C.: As you know, Mr. Zomahoun, since independence we have been subjected to a more or less Western curriculum. People are really talking about the African renaissance. Africa must be itself, and therefore do things for itself and do things that originate in Africa. Does AIMS think the same way? Namely, doing things that are really African, that have become Africa, that are the best for us?*

T. Z.: You rightly mentioned the education itinerary, that of the system and the evolution of the education system in Africa. There was a time when Africans weren't sufficiently gifted for science, at least, that is what we were told. A while ago, for the administration or its employees, what was good for Africa was cut-rate training. There was a moment, not so long ago, when certain development programs made us believe that investing in the early childhood sub-sector of education was a luxury, that Africa didn't need it. More recently, that investments should be directed to the basic education sector, then the uni-

versity and higher education sector was also considered a luxury. I must say that at each stage, at AIMS, we do not see the world in black and white. Even if it is true that Africa has a great need to massively invest in basic education, it remains nonetheless true that no country can develop and maintain itself in today's world simply by limiting its investments to a single subsector of education. Today, we must have an increased investment and I am not talking solely about financial investment. We are also talking about scientific and technical expertise, human capital. We must have an increased investment not only in higher education but also in the scientific sector.

The sciences have been neglected for a long time.

You are familiar with the statistics. In some of our countries, very few students will register for science courses. Why? In fact because there is work that should be done in this area and that has not been done enough. And that is what we do at AIMS. When you take our program, our curriculum, it is innovative and is especially designed to solve problems, to meet the development challenges of the African continent. It is not a program that only fulfills the needs of the intellectual spirit, that only provides knowledge acquired from books where we bombard the student with academic knowledge, that in the end the student winds up with a diploma but doesn't know what to do with it. That is why at AIMS, we talk about cutting-edge training programs adapted to the needs and challenges of the African market, and when I talk about these challenges, I am talking about the private sector, the not-for-profit sector and the public administration. You are familiar, for example, with the training we give our students in mathematical sciences.

You know that some of our students after completing their training can enter the healthcare sector, attack the problem of epidemiological modeling; others go into the banking sector and still others work in specific research on food security using the tools of mathematical sciences.

It is these types of sciences that Africa needs today. Of course, Africa still needs fundamental research and at AIMS, what is interesting is that there is no opposition between fundamental research and applied research. In fact, it is a continuum. Solutions come from fundamental research. Take, for example, how mathematical sciences have evolved. When certain

founding fathers in this field talked about primary numbers – numbers that are only divisible by themselves and by one – no one knew that when the first mathematicians invented them that primary numbers would be applied to what we use today. You and I use bankcards, bank transfers and on-line financial



**Neil Turok with students**

transactions. They latter have only been made possible by the application of the properties of primary numbers. That is why you can do a transaction on

line. I can do the same transaction. You go to an ATM and you withdraw money. And I can also go and take out money without any mistakes. It is all based on primary numbers. The inventors of primary numbers could never have imagined that what they invented would have a concrete application in our daily lives. And that is, however, what has happened. That is why we talk, at AIMS, about continuum, from fundamental research to applied research, and that is what we work on. So, this more or less explains that

the training programs at AIMS are very progressive, evolve very quickly; they adapt to the specificities of the market in Africa and are especially designed to train a new type of African, a new type of leader for the continent, above and beyond mathematical sciences. This is what we train young people for in our centers of excellence, to better appropriate the problems of the African continent from every angle. And this is what makes the difference between the centers of excellence and certain training structures or institutions of higher education.

*L. C.: There also gender questions. In the Ministries of Education, it is said that in Africa, girls and women are very weak in mathematics and science. I'm sure that you have already taken this into account and that you are in the process of taking steps to really tackle these problems. What exactly are you doing and what are you planning to do at AIMS to solve these gender problems in science teaching?*

T. Z.: First, permit me to tell you that those who maintain that women and girls are weak in science have no experience in the matter and don't know what they're talking about. Our experience totally contradicts what people say. I can tell you that among the best students in our centers of excellence there are women. And not the least of them. Brilliant African women who have proved themselves in our centers of excellence in which the training programs and learning conditions exist round-the-clock, seven days a week. They keep up as well as the men, and even better than them. Today, 30% of our alumni and our current students in our centers of excellence are women. It is an infinitely better record than a lot of statistics that you find in science faculties even in the developed countries. With 30% of our young scientists in training women, our longer-term objective is to have 50% women and 50% men in our centers of excellence. Let me give you an example.

It is sometimes surprising for certain people who think that science courses aren't made for women, to discover that we have a lot of women who come from Sudan, Nigeria, Madagascar and all the African countries, just like men. And if you ask why people think this way, they say that it is because certain things, certain institutions, certain systems in our countries marginalize women. And, as a result, at the origin, girls are not encouraged to embrace the sciences.

At AIMS, we have three program pillars: the first is university-level cutting-edge training in mathematical sciences; the second is scientific research. The third is the public's involvement because it is through this pillar that AIMS goes to the grassroots in the communities and schools to make young students, boys and girls, and their families aware, through the media and public lectures, of the importance of science for the individuals that we are, of the impor-

tance of mathematical sciences for the communities, the nations and the African continent. When you manage to raise people's awareness at this level, you'll eventually have a critical mass of young people, both boys and girls, who will study science. So we are in the process of experimenting with something that is revolutionary on the African continent: that increasingly a lot of brilliant young women are taking an interest in scientific fields and that they will give their all and succeed as well, if not better, than a lot of young men.

*L. C.: I asked this question because in our administrations, in which I have worked for over 20 years now, people always say that special efforts have to be made, special measures taken for girls, their education and school registration in many countries. Even in Benin, where I worked for over six years, there is a special program for girls' education. There are also celebrities from Africa and even other continents who are involved with the United Nations and its specialized agencies as goodwill ambassadors for girls' education. From this viewpoint, as an organization, does AIMS, as you just said, raise awareness in the public to encourage everyone to embrace scientific subjects? In other words, what are you doing in the institutions to communicate to everyone – heads of state, decision-makers in the ministries, etc. – and to really spread the message about these women, that they exist, because even if they are there, they aren't known, and therein lies the problem.*

T. Z.: At AIMS, the African Institute of Mathematical Sciences, there are three strategies to reach this layer of the population that has been unjustly marginalized for many reasons. The first strategy is engagement, the involvement of policy-makers. This means creating a single policy, in partnership with pan-African institutions like the ADEA (Association for the Development of Education in Africa) to act on education policies that permit women and girls to be involved in the system. This means an education policy that makes the conditions of the education system favorable to the involvement of girls and their success in the system. This is the first strategy. The second that we have at AIMS consists in using women role models. Did you know that the first woman mathematician on this continent, born in Came-

room, got her doctorate in 1971? I think that she is someone that we can get involved in this message with the ADEA, and institutions like it, to talk about the continent-wide plan and to do work on mobilization, together with us, for the involvement and commitment of women and even to attract the attention of our policy-makers on this point. The third strategy consists in attracting high-level scientists to get directly involved, wherever they come from the world, Europe, North America, Asia, to bring them to the African soil to talk about science to African young people. This means both boys and girls, and to show that you don't need to have two heads to shine in science and that women have the same head, the same brain as men. Often, and in most of the cases we've seen, when you give women and girls the same opportunities, they show that they are clearly more capable than what men think. So you have a brief résumé of the three strategies we propose.

*L. C.: Do you think that the United Nations should, for example, formulate another strategy to encourage women to get more and better involved in science and mathematics?*

T. Z.: At this stage, I believe, we don't need several other strategies. There are a lot of strategy documents written during the last 30 years. Especially during the last two decades, many of them have focused on the involvement of women, gender policy. The idea is to review, take stock of what has been accomplished. In terms of these policies' effectiveness, we should analyze and evaluate them and review how, in their implementation, we have improved everything that had been done. Having people write other strategies would be a waste of resources, and sometimes people spend more time pondering strategies than implementing them. We think that the problem now isn't a shortage of strategies, and sometimes there are even too many of them. You just have to look at and review what has been done until now, over these last two decades, and see where there are possible adjustments. We think that the implementation of strategies that already exist is extremely important, as some of them have not been properly executed.

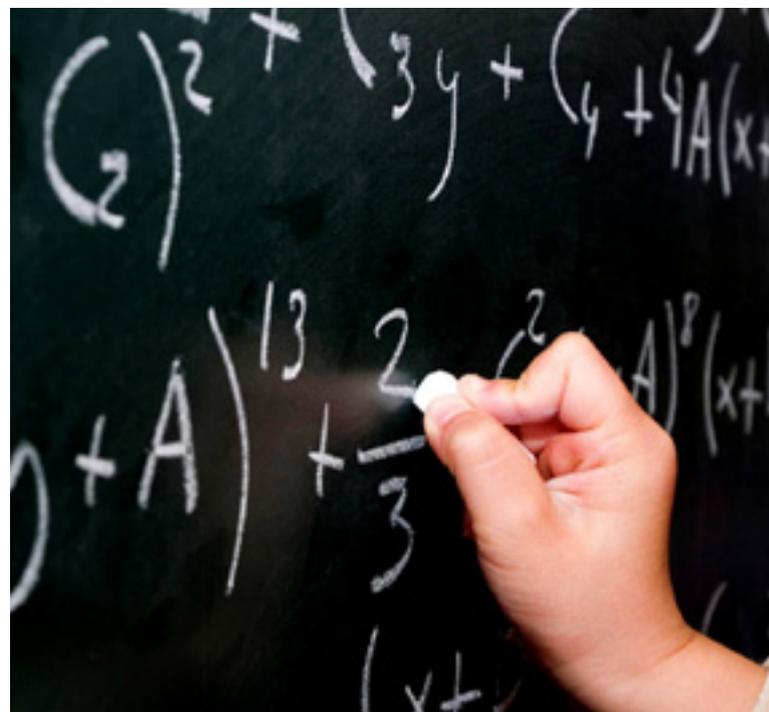
*L. C.: A last question. What is envisaged with ADEA? A protocol agreement with ADEA has been mentioned. What do you plan to do with the association now?*

T. Z.: For AIMS, ADEA is a pan-African institution of

reference in the education sector.

It has proved throughout its entire existence that it is a pioneer in transforming our continent's education landscape. What we envisage doing with ADEA is taking the two institutions' ambitions further to serve the African continent. We want an Africa that is totally transformed by the education system, an Africa that has the means to carry out its policy, an Africa that has the resources, competencies and aptitudes needed to lead its own development without being dependent on the exterior. We want an Africa that is respected because it has the necessary technical and scientific competencies. That is why we are going into this partnership that we envisage with ADEA.

The first point of this partnership is to focus, converge our efforts on science, technology, the arts, engineering and mathematical sciences. The second is building the continent's research and development capacities. I will give you an example: today, many of our countries have a low capacity in research and development. Sometime we can't use the software we buy from other countries. We spend hundreds of millions of francs to buy software that can't be applied. What if we developed endogenous scientific competencies that worked with the others? It is



not a question of working for a self-sufficient Africa. We are in an increasingly smaller universe in which Africa can't go it alone. Africa must evolve and share with the other continents. And we think that in solving its problems, Africa will provide solutions to the

problems that humanity faces. The third focus of this partnership is our desire to give young African scientists visibility, to offer them a platform to show what that are doing, the scientific and technical discoveries on which they are working. In short, a platform permitting them to exhibit the fruits of their research, something they don't have today. Each of them tries to hang on, to position himself somehow or other. We want Africa to be visible in this realm. With ADEA, we want to try to work with the African states and governments, because we can't do anything without them. We want to work with the continent's education decision-makers so that Africa's education policies in general, and in particular in the science and technology and professional sectors, are rethought in such a way as to permit Africa to become strong technically and scientifically because it is in doing so that Africa can position itself in this new century. You know that in the last 90 years, we have gone through two major stages. I won't speak about the industrial revolution but about information and communication technologies. We went through the analogue era and are now in the digital era. The latter is in the process of giving way to the quantic era. Over the two information technology periods, the analogue and the digital, Africa has not been able to compensate for its lag. With ADEA, we want to work so that the quantic era that is coming, which will enable the world to multiply the performance of the information and communication technologies that we now have in the digital era, will enable Africa to make up for its lag and position itself, because Africa has the most young people of all the world's regions. In fewer than three decades, 40% of this planet's youth will be called Africans, and we know how easily young people appropriate information technologies. These then are the focuses on which we want to work with ADEA. We think that with the association and in partnership with the states and the African Union that we can contribute to this continent's development.

*L. C.: One last thing, Mr. Zomahoun. It concerns financing these types of projects because there have always been constraints when it comes to raising funds to finance our activities in Africa ourselves. What is your opinion? What should those of us who belong to institutions like this one do to alert our leaders so that they contribute financially to our activities and projects?*

T. Z.: At AIMS, we believe that the best way for Africa to develop is to start by mobilizing, itself, endoge-

nous resources for its scientific and technological transformation.

As long as we depend on the exterior world to finance our research programs and our training centers, I believe we will never succeed in reaching our development objectives. But that doesn't mean that we won't ask to work in partnership with international institutions, our foreign partners and foreign scientific institutions.

Of course we will work with them, but the most sustainable path for Africa is for it to mobilize, itself, its domestic resources. What has been an obstacle to what we can do is too often not the lack of financial resources, but because institutions like ADEA and AIMS must demonstrate to our policy-makers how the sciences can contribute to development and the transformation of this continent. We show them the role science can play in wealth creation, the development of the private sector and the improvement in the public administration's efficiency. Imagine for a moment. Planning is done in all our public administrations and there are statistics departments. It is hard not to see the importance of mathematical sciences in each country's national statistics department. In certain of our countries, there isn't much of anything in this department. How can you formulate a good policy, in any sector, without using reliable research and data bases? And how can you have these data bases without well-trained statisticians and qualified mathematicians? So, when we can, we succeed in proving to our policy-makers that these sciences can contribute to the country's economic and social development and to the improvement of all its development systems. From our viewpoint at AIMS, we've seen that this has worked. I believe that our policy-makers take a long time to be convinced. They see the importance of these sciences and they do everything necessary to help finance these research centers, but it is up to us to show them concrete results. I think that if we manage to do that, we can mobilize our policy-makers around our projects. But I also understand that our states are fighting on all fronts and that their budgets aren't elastic. So if they manage to contribute part of the financial resources, we can ask our international partners and international and pan-African financial institutions to also contribute until the point where our states have the capacity to provide 100% of these financial resources.

*L. C.: Thierry Zomahoun, thank you.*

T. Z.: Thank you.

# Strengthening Mathematics and Science Education in West, East, Central and Southern Africa (SMASE-WECSA)



Since 2005, ADEA has partnered with the Japan International Cooperation Agency (JICA) and the Ministry of Education, Science and Technology of Kenya (MOEST). One of the flagship programs that resulted from this partnership is the ADEA WG on Mathematics and Science Education (WGMSE). WGMSE is led by both JICA and MOEST Kenya. The three institutions have since then been pushing the agenda of quality science and mathematics teaching in Africa. The SMASE program in Africa concerns 36 countries and has been fully supported by JICA over the last 15 years. It consists of pre and in-service teacher training of math and science teachers with an innovative and effective pedagogy developed by Japanese experts and their African counterparts.

The 13th Annual SMASE-WECSA Association Conference whose theme was 'Rethinking the Strategies for the Future Sustainability of SMASE-WECSA', was held in Nairobi, Kenya from October 28-November 1, 2013. This conference was happening on the verge of JICA's likely disengagement from SMASE-Kenya after more than a decade of cooperation. Over the years JICA had used the Centre for Mathematics, Science and Technology Education in Africa (CEMESTE) of Kenya to train trainers of trainers from 36 African countries. The future of this arrangement is now

uncertain, as this withdrawal by JICA will have far reaching implications for the future of the SMASE-WECSA Association (now renamed SMASE-Africa) and also that of the ADEA WG on Mathematics and Science Education that have benefited from JICA's funding to function. The issue now is how to sustain such an important network for Africa and hence the theme of the Conference.

ADEA highlighted how mathematics, science and technology are at the core of the paradigm shifts ADEA is advocating. Emphasizing the three areas of skills, competencies and qualifications put forth by the ADEA Strategic Policy Framework that was born out of the 2012 Triennale: (i) common core skills, (ii) technical and vocational skills development and (iii) scientific and technological skills, The ADEA representative at the conference exposed the convergence between ADEA's mission and that of SMASE-Africa. The Challenge now is how to reconcile what the Association and the ADEA WGMSE are set to do. New options are currently being sought to ensure the sustainability of the mathematics and science program in Africa given its importance for the future development of the continent.

### ADEA supports the Kenyan ministerial and parliamentary delegation to learn from Portugal's successful implementation of an ICT in education policy

The Ministry of Education, Science and Technology (MOEST) of the Government of Kenya (GoK) is currently exploring ways and means of implementing the "One-Laptop-Per-Child" pledge made by President Uhuru Kenyatta as he came into Office last year. The pledge has now become a policy and earlier in the year, MOEST officials approached the ADEA Task Force on ICT Integration to support them in identifying a best practice and a private ICT firm that will partner with them to deliver on the policy. After screening several options, the ICT Task Force identified the Portuguese consortium Millenium@edu that was instrumental in implementing one of the most successful ICT integration policies in the world: that of Portugal.

To facilitate the GoK's decision on the relevance of the Portuguese ICT in education experience, ADEA and the Millenium@edu leadership proposed that the Kenyan Minister of Education, Science and Technology undertake a fact-finding mission from 17-21 November, 2013. Hon. Jacob Kaimenyi was accompanied by two of his senior officers and an 8-member delegation of Kenyan Members of Parliament (MPs) serving on the Kenyan Parliament's Education Committee that is overseeing education policies in the country.

ADEA played a key role in this brokering this Public-Private Partnership (PPP), with the participation of the Acting Executive Secretary, Hamidou Boukary who accompanied the Minister of Education of Kenya and his delegation during the visit in order to advise and also learn from the experience. Millenium@edu facilitated the mission through demonstrating that a successful one-laptop-per-child policy needs to be underpinned by an "eco-system" of interlinked public and private institutions and industries to enable "every student and teacher in the program to access Information, Communication and Scientific Technologies (ICSTs) including computing devices, content, software and applications all specially tailored for learning". Without this the laptop will be just a device devoid of any capacity to provide systematic learning.

The Portuguese Minister of Education and Science,



Mr. Nuno Crato exchanged on various issues on this subject with Hon. Kaimenyi focusing on Portugal's ICT policy and its implementation challenges and success factors. The delegation also visited the members of the Consortium both in Lisbon and Porto. These included a leading publishing company (LeYa) that produces and digitizes textbooks for schools, Microsoft Portugal, Intel and JP - Inspiring Knowledge, a Portuguese company dedicated to the design, manufacturing and marketing of high-quality computer equipment, including the famous Magalhães computer (highly resistant to shocks and extreme climatic conditions). The JP plant in Porto revealed first-hand how the computers are assembled and the delegation received comprehensive presentations on curriculum development, teacher training and production of instructional materials. A Task Force will be solicited by the Kenyan government for further support and ADEA will need to respond positively, especially in the light of the recently concluded ICT Forum in Tunis. ADEA has much to gain in fostering such as PPPs across Africa.

## Inter-Ministerial Forum ends with a call for Africa to assume its place in the world of information and communication technology

The First Inter-Ministerial Forum held from 9 – 11 December in Tunis ended with a call for African countries to prepare and adopt a national policy framework to integrate ICT in their education and training systems. The Conference also called educators to invest much more time, money and effort in information and communication technology (ICT).

The Conference was attended by over 250 participants from Africa and other regions of the world, with more than 20 African ministers present. World renowned scientists and other experts in education, science and technology also took part in the conference.

The central recommendation from the forum was that all African countries should have a national policy on how to introduce ICT at all levels of education, including the primary, secondary and tertiary levels.

The use of ICT can considerably ease the formidable challenges faced by African education and training systems. The challenges are many. More than 30 million African children of primary school age not attending school and Africa needs another million teachers. Africa's "marginalized populations" must also benefit from ICT in education. Women and girls do



continent, children working in agriculture, orphans, the disabled and people affected by HIV and AIDS.

Without ICT in education and training, Africa risks falling behind the rest of the world, despite its current high levels of economic growth, due to increasing globalization in science, technology and media.

The conference also called on the private sector and development agencies to be involved in the process, particularly through public-private partnerships. Integration of ICT into education and training should not just be the state's responsibility.

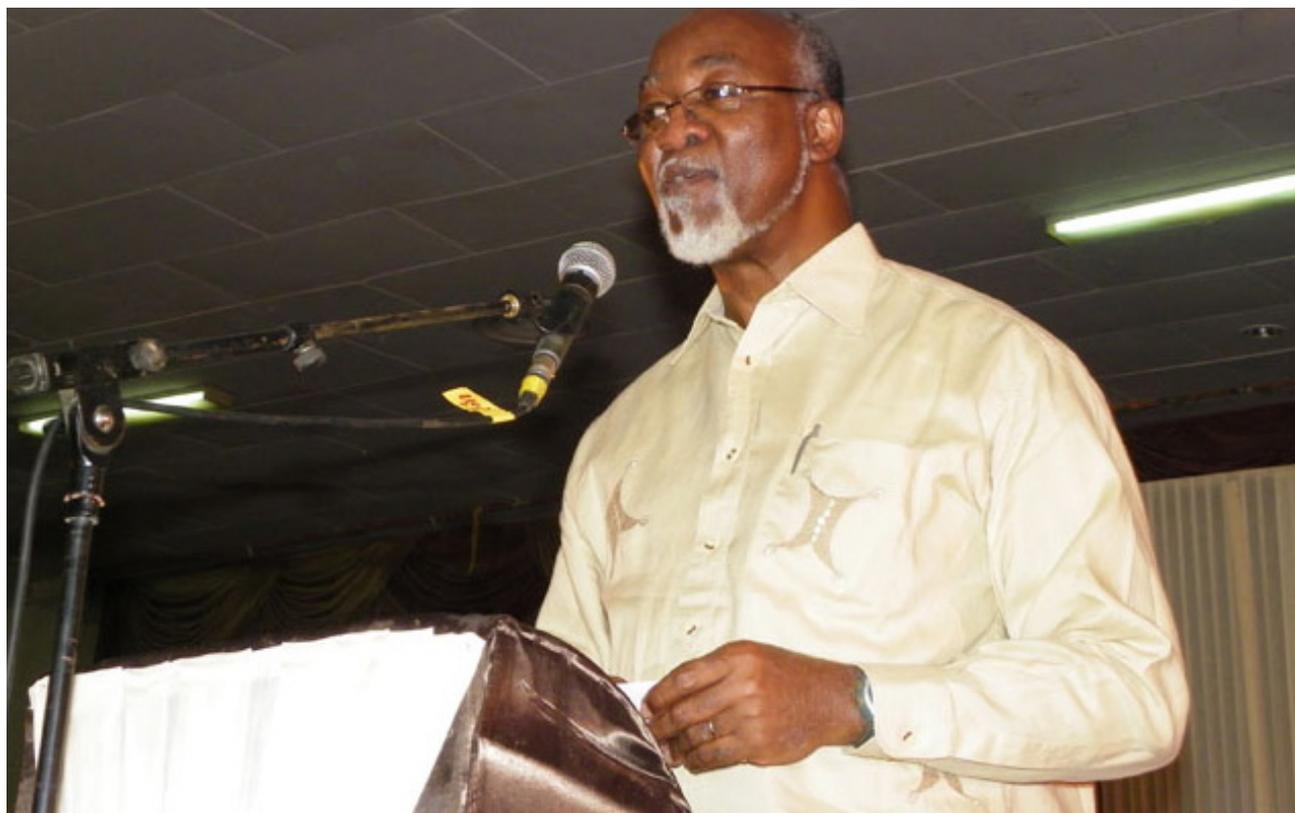
ADEA's Chair, Mr. Dzingai Mutumbuka, signed two MoUs with Microsoft and Intel, which are intended to frame a collaborative scheme to advance the use of ICTs in education and training.

The forum was co-organized by ADEA, the African Development Bank (AfDB), UNESCO, the Organisation Internationale de la Francophonie (OIF) and Intel, under the auspices of the Tunisian government through its Ministry of Education.



not always have access to education, and other excluded groups include people in remote parts of the

# ADEA bids farewell to its former Executive Secretary, Mr. Jean Marie Ahlin Byll-Cataria



Following his retirement from active service as the Executive Secretary of ADEA, the members of the ADEA Steering Committee and Staff at the ADEA Secretariat in Tunis, and the Working Groups based in various regions of Africa bid farewell to their former Executive Secretary on Friday December 13, 2013.

Representatives from various constituencies of ADEA including the ADEA Secretariat, the Working Groups, the Bureau of Ministers, and the development cooperation agencies praised Mr. Byll-Cataria for his profound commitment to education in Africa as well as his outstanding contribution to the work of ADEA. The ADEA Chair, Mr. Dzingai Mutumbuka in paying tribute to Mr. Byll-Cataria cited his exemplary

achievements during his tenure of office. Particularly notable is Mr. Byll-Cataria's leadership in leading the work for ADEA's 2012 Triennale on "Critical knowledge, skills and qualifications for Africa's development" and, stemming from it, the paradigm shifts recommended for African education and training systems.

Ahlin Byll-Cataria was actively involved in ADEA for numerous years. In addition to being ADEA's Executive Secretary between August 2008 and September 2013, he was also Chair of ADEA between 2001 and 2006 and, prior to that, DDC's representative on the ADEA Steering Committee.



## Vision letter from the African Union Heads of States Summit – January 2014 AUC Chairperson's E-mail from the Future

*Addis Ababa, 26 January 2014:* During the Ministerial retreat of the African Union's Executive Council being held in Bahir Dar, Ethiopia, from 24th to 26 January 2014, the Chairperson of the AU Commission, Dr Nkosazana Dlamini Zuma outlined her vision of Africa in 50 years' time, through "an email from the future". This email below was written to a hypothetical Kwame in the year 2063:

Date: 24 January 2063  
To: Kwame@iamafrican.com  
From: Nkosazana@cas.gov  
Subject: African Unity



My dear friend Kwame,

Greetings to the family and friends, and good health and best wishes for 2063.

I write to you from the beautiful Ethiopian city of Bahir Dar, located on Lake Tana, as we finalize preparations for the Centenary celebrations of the Organisation of African Unity, which became the African Union in 2002 and laid the foundations for what is now our Confederation of African States (CAS).

Yes, who would have thought that the dream of Kwame Nkrumah and his generations, when they called in 1963 on Africans to unite or perish, would one day become a reality. And what a grand reality.

At the beginning of the twenty first century, we used to get irritated with foreigners when they treated

Africa as one country: as if we were not a continent of over a billion people and 55 sovereign states! But, the advancing global trend towards regional blocks, reminded us that integration and unity is the only way for Africa to leverage its competitive advantage.

In fact, if Africa was one country in 2006, we would have been the 10th largest economy in the world! However, instead of acting as one, with virtually every resource in the world (land, oceans, minerals, energy) and over a billion people, we acted as fifty-five small and fragmented individual countries. The bigger countries that should have been the locomotives of African integration, failed to play their role

# Vision letter

at that time, and that is part of the reasons it took us so long. We did not realize our power, but instead relied on donors, that we euphemistically called partners.

That was the case in 2013, but reality finally dawned and we had long debates about the form that our unity should take: confederation, a united states, a federation or a union.

As you can see, my friend, those debates are over and the Confederation of African States is now twelve years old, launched in 2051.

What was interesting was the role played by successive generations of African youth. Already in 2013 during the Golden Jubilee celebrations, it was the youth that loudly questioned the slow progress towards integration. They formed African Union Clubs in schools and universities across the continent, and linked with each other on social media. We thus saw the grand push for integration, for the free movement of people, for harmonization of education and professional qualifications, with the Pan African University and indeed the university sector and intelligentsia playing an instrumental role.

We were a youthful continent at the start of the 21st century, but as our youth bulge grew, young men and women became even more active, creative, impatient and assertive, often telling us oldies that they are the future, and that they (together with women) form the largest part of the electorates in all our countries!

Of course this was but one of the drivers towards unity. The accelerated implementation of the Abuja Treaty and the creation of the African Economic Community by 2034 saw economic integration moved to unexpected levels.

Economic integration, coupled with infrastructure development, saw intra-Africa trade mushrooming, from less than 12% in 2013 to approaching 50% by 2045. This integration was further consolidated with the growth of commodity exchanges and continental commercial giants. Starting with the African pharmaceutical company, Pan African companies now not only dominate our domestic market of over two billion people, but they have overtaken multi-nationals from the rest of the world in their own markets.

Even more significant than this, was the growth of

regional manufacturing hubs, around the beneficiation of our minerals and natural resources, such as in the Eastern Congo, north-eastern Angola and Zambia's copper belt and at major Silicon valleys in Kigali, Alexandria, Brazzaville, Maseru, Lagos and Mombasa, to mention but a few such hubs.

My friend, Africa has indeed transformed herself from an exporter of raw materials with a declining manufacturing sector in 2013, to become a major food exporter, a global manufacturing hub, a knowledge centre, benefiting our natural resources and agricultural products as drivers to industrialization.

Pan African companies, from mining to finance, food and beverages, hospitality and tourism, pharmaceuticals, fashion, fisheries and ICT are driving integration, and are amongst the global leaders in their sectors.

We are now the third largest economy in the world. As the Foreign Minister's retreat in Bahir Dar in January 2014 emphasized, we did this by finding the balance between market forces and strong and accountable developmental states and RECS to drive infrastructure, the provision of social services, industrialization and economic integration.

Let me recall what our mutual friend recently wrote:

"The (African) agrarian revolution had small beginnings. Successful business persons (and local governments) with roots in the rural areas started massive irrigation schemes to harness the waters of the continent's huge river systems. The pan-African river projects - on the Congo, the Nile, Niger, Gambia, Zambezi, Kunene, Limpopo and many others - financed by PPPs that involved African and BRIC investors, as well as the African Diaspora, released the continent's untapped agricultural potential.

By the intelligent application of centuries-old indigenous knowledge, acquired and conserved by African women who have tended crops in all seasons, within the first few years bumper harvests were being reported. Agronomists consulted women about the qualities of various grains - which ones survived low rainfalls and which thrived in wet weather; what pests threatened crops and how could they be combated without undermining delicate ecological systems.

# Vision letter

The social impact of the agrarian revolution was perhaps the most enduring change it brought about. The status of women, the tillers of the soil by tradition, rose exponentially. The girl child, condemned to a future in the kitchen or the fields in our not too distant past, now has an equal chance of acquiring a modern education (and owning a farm or an agribusiness). African mothers today have access to tractors and irrigation systems that can be easily assembled.

The producers' cooperatives, (agribusinesses) and marketing boards these women established help move their produce and became the giant food companies we see today.

We refused to bear the brunt of climate change and aggressively moved to promote the Green economy and to claim the Blue economy as ours. We lit up Africa, the formerly dark continent, using hydro, solar, wind, geo-thermal energy, in addition to fossil fuels.

And, whilst I'm on the Blue economy, the decision to form Africa-wide shipping companies, and encourage mining houses to ship their goods in vessels flying under African flags, meant a major growth spurt. Of course the decision taken in Dakar to form an African Naval Command to provide for the collective security of our long coastlines, certainly also helped.

Let me quote from our mutual friend again:

'Africa's river system, lakes and coast lines abound with tons of fish. With funding from the different states and the Diaspora, young entrepreneurs discovered... that the mouths of virtually all the rivers along the east coast are rich in a species of eel considered a delicacy across the continent and the world.

Clever marketing also created a growing market for Nile perch, a species whose uncontrolled proliferation had at one time threatened the survival of others in Lake Victoria and the Nile.

Today Namibia and Angola exploit the Benguela current, teaming with marine life, through the joint ventures funded by sovereign funds and the African Development Bank."

On the east coast, former island states of Seychelles, Comoros, Madagascar and Mauritius are leading

lights of the Blue economy and their universities and research institutes attract marine scientists and students from all over the world.

Dear friend, you reminded me in your last e-mail how some magazine once called us 'The hopeless continent', citing conflicts, hunger and malnutrition, disease and poverty as if it was a permanent African condition. Few believed that our pledge in the 50th Anniversary Declaration to silence the guns by 2020 was possible. Because of our firsthand experience of the devastation of conflicts, we tackled the root causes, including diversity, inclusion and the management of our resources.

If I have to single out one issue that made peace happened, it was our commitment to invest in our people, especially the empowerment of young people and women. By 2013 we said Africa needed a skills revolution and that we must change our education systems to produce young people that are innovative and entrepreneurial and with strong Pan African values.

From early childhood education, to primary, secondary, technical, vocational and higher education – we experienced a true renaissance, through the investments we made, as governments and the private sector in education and in technology, science, research and innovation.

Coupled with our concerted campaigns to eradicate the major diseases, to provide access to health services, good nutrition, energy and shelter, our people indeed became and are our most important resource. Can you believe it my friend, even the dreaded malaria is a thing of the past.

Of course this shift could not happen without Africa taking charge of its transformation, including the financing of our development. As one esteemed Foreign minister said in 2014: Africa is rich, but Africans are poor.

With concerted political determination and solidarity, and sometimes one step back and two steps forward, we made financing our development and taking charge of our resources a priority, starting with financing the African Union, our democratic elections and our peacekeeping missions.

The Golden Jubilee celebrations were the start of a

# Vision letter

major paradigm shift, about taking charge of our narrative.

Agenda 2063, its implementation and the milestones it set, was part of what brought about this shift. We developed Agenda 2063 to galvanize and unite in action all Africans and the Diaspora around the common vision of a peaceful, integrated and prosperous Africa. As an overarching framework, Agenda 2063 provided internal coherence to our various sectoral frameworks and plans adopted under the OAU and AU. It linked and coordinated our many national and regional frameworks into a common continental transformation drive.

Planning fifty years ahead, allowed us to dream, think creatively and sometimes crazy as one of the Ministers who hosted the 2014 Ministerial retreat said, to see us leapfrog beyond the immediate challenges.

Anchored in Pan Africanism and the African renaissance, Agenda 2063 promoted the values of solidarity, self-belief, non-sexism, self-reliance and celebration of our diversity.

As our societies developed, as our working and middle classes grew, as women took their rightful place in our societies, our recreational, heritage and leisure industries grew: arts and culture, literature, media, languages, music and film. WEB du Bois grand project of Encyclopedia Africana finally saw the light and Kinshasa is now the fashion capital of the world.

From the onset, the Diaspora in the traditions of Pan Africanism played its part, through investments, returning to the continent with their skills and contributing not only to their place of origin, but where the opportunities and needs were found.

Let me conclude this e-mail, with some family news. The twins, after completing their space studies at Bahir Dar University, decided to take the month before they start work at the African Space Agency to travel the continent. My old friend, in our days, trying to do that in one month would have been impossible!

But, the African Express Rail now connects all the capitals of our former states, and indeed they will be able to crisscross and see the beauty, culture and diversity of this cradle of humankind. The marvel of the African Express Rail is that it is not only a high speed-train, with adjacent highways, but also

contains pipelines for gas, oil and water, as well as ICT broadband cables: African ownership, integrated planning and execution at its best!

The continental rail and road network that now crisscross Africa, along with our vibrant airlines, our spectacular landscapes and seductive sunsets, the cultural vibes of our cities, make tourism one of our largest economic sectors.

Our eldest daughter, the linguist, still lectures in Kiswahili in Cabo Verde, at the headquarters of the Pan African Virtual University. Kiswahili is now a major African working language, and a global language taught at most faculties across the world. Our grandchildren still find it very funny how we used to struggle at AU meetings with English, French and Portuguese interpretations, how we used to fight the English version not in line with the French or Arabic. Now we have a lingua franca, and multi-lingualism is the order of the day.

Remember how we used to complain about our voice not being heard in trade negotiations and the Security Council, how disorganized, sometimes divided and nationalistic we used to be in those forums, how we used to be summoned by various countries to their capitals to discuss their policies on Africa?

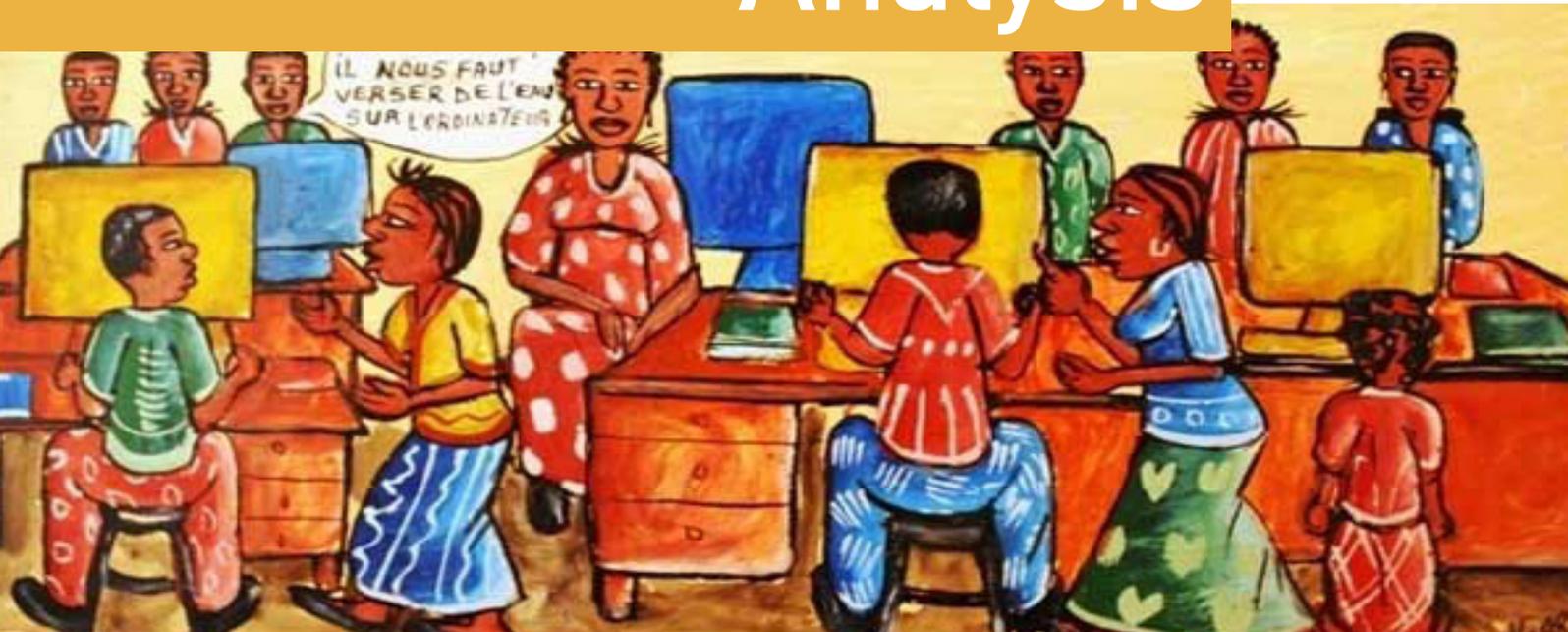
How things have changed. The Confederation last year celebrated twenty years since we took our seat as a permanent member of the UN Security Council, and we are a major force for global stability, peace, human rights, progress, tolerance and justice.

My dear friend, I hope to see you next month in Haiti, for the second round of unity talks between the Confederation of African States and the Caribbean states. This is a logical step, since Pan Africanism had its roots amongst those early generations, as a movement of Africans from the mother continent and the Diaspora for liberation, self-determination and our common progress.

I end this e-mail, and look forward to seeing you in February. I will bring along some of the chocolates from Accra that you so love, which our children can now afford.

Till we meet again,  
Nkosazana.

# Analysis



## Enhancing ICT Integration in Teaching and Learning of Mathematics and Science: The TPACK framework

By: MAKOBA Edmond Kizito and NG'ENY Ernest

Centre for Mathematics Science and Technology Education in Africa (CEMASTEAM)

This paper was extracted from a presentation made at the SMASE – WECSA Regional Conference, Nairobi, Kenya - October 28 – November 1, 2013

Learning by students can be improved significantly by addressing instructional problems, and increasing teachers' knowledge of content and effective pedagogies. Active learning is one of such strategies that place learners at the center of teaching. It encourages them to construct meaning by actively combining knowledge with experience, as teachers provide support mechanisms for them to connect new knowledge with prior knowledge (Drew and Hanafin, 2010). The effective use of tools such as ICTs and well-designed activities is critical to achieving active learning. On the other hand Learner centered classrooms are essential in fostering independent thinking; problem solving and collaboration skills. It is therefore a catalyst for inculcating 21st Century skills amongst learners.

Although teachers learn about principals and importance of learner centered teaching and learning approaches during pre-service and in-service, their

actual practice in class is still insignificant.

Since the job market requires graduates of schools to be critical thinkers, innovative, creative and problem solvers for the advancement of society, the need for the shift from teacher centered to learner centered instruction is greater now than ever before. (Keengwe, J. et al 2008). Studies have shown that students prefer a learner centered approach while teachers on the other hand prefer a teacher centered instructional approach. The reluctance to shift from teacher centered to learner centered is highly influenced by a teachers' own concept of what is teaching (V.Mellado, et al.2007). To most teachers, teaching may mean transmitting knowledge to students based on the curriculum, or telling while learning is listening. In other cases teachers believe the way they were taught while in school which was usually more teacher and content centered is the best way to teach.

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This situation can be resolved through effective professional development programmes that provide teachers with opportunities to improve their content, pedagogical and technological knowledge in a contextualized way. Contextualized programmes helps teachers to improve student learning. It builds their capacity to facilitate students to learn by themselves, make learners interested in what they learn, relate what is new with their previous knowledge and applying knowledge learned to different situations(Soonhye P.,et al 2006).

Teachers' skills to practice learner centered active learning approaches can be enhanced through ICT integration in teaching and learning.

## ICT Integration and Learner Centered Teaching: The TPACK Lesson Study Approach

ICT integration can be defined as the seamless incorporation of technology in teaching and learning. This means that the emphasis is on teaching and learning while technology is simply an important enhancer of this process.

Although the importance of technology in education is recognized, such as enabling teachers to save time, improvement of scores of learners when used effectively, addressing different learning styles, catering for special needs learners, simplifying difficult concepts and creating and sustaining interest among others, in practice very few teachers are integrating ICTs in their classrooms even where the infrastructures are available. The lack of practice is commonly attributed to lack of resources, leadership, wrong notion that technology is only for mathematics and science subjects, teacher attitudes and beliefs, lack of skills and finally lack of a technology based assessment framework that is aligned to the curriculum (Khe, F.H., and Thomas, B.2007).

Although technologies such as mobile phones, still and video cameras, TVs and DVD players are common in most schools they are not seen as ICTs except computers. This therefore means that the greatest barriers to integration of technology in teaching and learning are the lack of skills and the teachers' attitudes and beliefs.

Supporting teachers to integrate technology through TPACK model

Encouraging teachers to integrate technology in teaching, calls for opportunities that will make teachers see the relationship between the technology being used and the content being learnt using actual classroom illustrations. They should also be made to understand the various aspects to consider when preparing ICT integrated lessons, including encouraging them to develop ICT integrated lesson plans collaboratively through lesson study approach. This approach provides teachers with the opportunities to observe expert teachers integrating ICT in an actual classroom situation (Lim & Khine, 2006).

Successful integration further requires knowledge of the subject matter, an understanding of how students learn and a level of technical expertise (Morgan, 1996). This means that knowledge about Technology, Pedagogy and Content (TPACK) is central to good teaching. TPACK represents a new direction in understanding the complex interactions among content, pedagogy and technology that can result in successful integration of technology in the classroom. It is an extension of Pedagogical Content Knowledge (PCK) and is achieved when a teacher knows how technological tools can transform pedagogical strategies and content representations for teaching specific topics (Koehler et al., 2007).

TPACK is grounded in the understanding that quality teaching and learning happens when there is a seamless relationship among the three knowledge areas.

## Content Knowledge (CK)

Content knowledge is about the knowledge that teachers have about the subject matter to be learnt or taught including related concepts, theories, ideas and sequential framework.

## Pedagogical Knowledge (PK)

Pedagogical knowledge is the teacher's knowledge about the process and methods of teaching and learning. It involves their understanding of how learners

# Analysis

construct knowledge and acquire skills.

## Technological Knowledge (TK)

Technological knowledge describes the teacher's competency with information technology. Teachers with such knowledge are able to perform a variety of tasks using technology as well as come up with different ways of performing a given task.

## Technological Content Knowledge (TCK)

Technological content knowledge is the understanding of how technology and content influence and constrain one another. Teachers need to understand the manner in which the subject matter can be represented or changed by the application of a particular technological tool. It also requires teachers to understand which specific technologies are best suited for learning in their subjects and how the content determines the type of technology and vice versa.

## Technological Pedagogical Knowledge (TPK)

Technological and pedagogical knowledge requires teachers to understand how teaching and learning can change when particular technologies are used in particular ways. It also involves knowing the pedagogical affordances and constraints of a range of technologies as they relate to specific subjects, pedagogical designs and strategies. For example how can word processors, presentations and spreadsheets be used for educational purposes? And how can social media that was mainly developed for entertainment, communication and social networking be harnessed for educational purposes? TPK therefore requires creativity and open mindedness to leverage technology to advance student learning and understanding.

## Technology, Pedagogy and Content Knowledge (TPACK)

TPACK is the understanding of the interactions among content, pedagogy and technology and forms the basis for effective teaching with technology.

The evidence of TPACK framework being used in the

development of ICT integrated lessons is exhibited when teachers are able to; identify challenging concepts to students and teachers, show the added value to enhance learning by using the identified technology in that topic. This means there are some topics in which use of technology may not have any value addition and therefore other teaching materials should be used. This further confirms technology as an enhancer and not a replacement of other teaching methods.

The TPACK compliant teachers are also able to identify representations such as animations, graphics, simulations, interactivity, videos and pictures for



transforming the content to be taught into forms that are comprehensible to learners but difficult to be supported by traditional means. Further evidence of TPACK uptake is when they can identify teaching strategies that are difficult or impossible to be implemented with traditional means, can choose appropriate ICT tools and identify their effective pedagogical uses. Finally when teachers can identify appropriate strategies to be combined with technology in the classroom that puts the learner at the center of the learning process (Syh-Jong,J.,Kuan-chung,C.2010).

The Lesson study as a strategy to achieve TPACK framework

Lesson study, which is a collaborative endeavor among teachers and other pedagogical experts to

# Analysis

plan, teach and improve lessons, provides an effective means of enhancing TPACK among teachers. It is a school based practice that is responsive to teachers working context. Lesson study can be defined as a process of teachers working in teams to develop lessons to address an identified problem in teaching and learning. The developed lesson is taught by one of the teachers while others observe. The team discusses the taught lesson and make improvements. Experts on active learning and technological pedagogical knowledge are also involved to provide support to teachers during this process. Lesson study is important because it can increase reflective practice, aid implementation of teaching models and instructional strategies and enhance classroom management and development of TPACK based technology integrated lessons (Syh-Jong,J.,Kuan-chung,C.2010).

## Conclusion and recommendations

The effective adoption of the TPACK framework for ICT integration in teaching and learning can be one way of achieving quality education in Africa. This is because ICTs when used well come along with several affordances like alleviating the problem of limited teaching and learning resources, affording the realization of learning any time anywhere, learner centered classrooms among others.

Despite the numerous advantages of using technology in teaching and learning, its uptake in most African countries is minimal and where it has been introduced, technology is used as an add-on tool. Majority of the teachers use it to implement traditional teacher centered classrooms. Given the high cost of technology, such a way of using it only makes education expensive.

In order to realize the seamless infusion of technology in teaching and learning, there is need for African governments and ministries of education in particular to come up with clear policies on ICT integration in education. There should be a clear vision of ICT both at the macro, meso and micro levels of education. All education stakeholders should be sensitized to get informed about the advantages of technology in education. This should be followed by building the capacity of teachers on ICT integration in teaching and learning. The teachers should also be enabled to access and develop digital content. Once this has been put in place the relevant infrastructure should be deployed in schools. The common practice in most countries is to deploy the infrastructure a head of sensitization and capacity building. This approach has been a contributing factor to the slow uptake and high failure rate of ICT integration in education initiatives.



## Focus on Malawi (Courtesy of JICA – the Japan International Co- operation Agency)



## The ‘Virtuous Circle’ of Better Math and Science Education

Teaching math and science at a rural Malawi school. Class size is sometimes more than 100 pupils, even 200. There is little science equipment or textbooks, even pencils and paper are normally in short supply. Teachers and pupils must often trek several hours on foot, bicycle or bus and a bad harvest can often mean almost empty classrooms when everyone is needed in the fields.

For governments such as that of Malawi, the choice is often harsh – books or food—there is rarely enough official funds for both.

But while trying to ensure food security for a population of nearly 15 million which is among the poorest in the world, the southern African state has also been devoting increasing funds to education in recent years.

In the country's 2011-2012 budget, the largest allocation of 54 billion kwacha (388 million dollars) was devoted to improving Malawi's fragile education system. The trend is seen as part of a 'virtuous circle' rather than the 'vicious circle' which often traps the economies of developing countries in endless poverty. Improved education can lead to improved economic performance, better farming methods and techniques which lead to improved harvests and food security. Birth rates may fall as young women attend class. And so forth.

Science and mathematics are key to a sound econo-

mic performance but stubbornly they are among the most difficult academic areas to improve. Without equipment, and even more importantly, good teaching skills, pupils are easily dissuaded from serious study.

The Japan International Cooperation Agency (JICA) has been involved for many years in trying to raise overall African standards in science and math and a project which began in Kenya has now spread to 24 countries.

Malawi was an early adherent to the concept and is involved in a nationwide attempt known bureaucratically as Strengthening of Mathematics and Science in Secondary Schools (SMASSE) to improve teaching standards.

While it is a government program, JICA has provided experts, volunteer teachers, basic equipment and both in-country and third-country training.

Phase one of the project between 2004-2008 targeted one division of the country to begin upgrading teacher skills. The current second phase which runs through 2012 encompasses the entire country and hopes to eventually reach all 3,400 registered science and math teachers at government schools.

«We try to identify the needs of the whole country and then develop a curriculum based on those needs,» says Hikaru Kusakabe, a former JOCV volunteer and the current resident JICA expert in Malawi overseeing

project management. Ten Japanese volunteers are currently working in schools as teachers.

#### Attending a rural science class

The hardships of education in developing countries can be difficult for experts and teachers as well as the students themselves.

«Sometimes the work is so frustrating and difficult, I want to just run away,» says Kusakabe with a laugh. «But of course I will stay. There is so much to do.»

Bethell Bakuwa is a bright young teacher who has taught science, math, biology and physical science for 10 years. «The first problem is myself,» he said after attending a recent leadership course with other teachers at a local school. «The students like me. I like them. They are eager for extra learning. But I need more education myself.»

«I need to improve myself. I need a better education,» he said. «But there is no money and only limited op-

portunities to improve. This project is helping.»

Upgrading a national education system in such circumstances—few financial or human resources—can be a long and difficult process.

But the SMASSE officials are convinced the project is making a difference.

Former secondary school teacher and now a national trainer and administrator in biology Mrs. Lucia Chidalengwa said, «Teacher standards are improving and this is reflected in the better students results we are seeing throughout the country.»

Malawi's future economic growth will depend, at least partially, on continued improvement in two school subjects which have always been among the most difficult to teach in school systems throughout the world.



## The Post 2015 Development Agenda: What are the priorities for Africa by Haroon Borat, Nonresident Senior Fellow, Africa Growth Initiative

(Courtesy of the Brookings Institution, Washington DC)

As 2015 and the conclusion of the Millennium Development Goals (MDGs) draws near, attention has increasingly turned within the United Nations to the post-2015 development agenda. In particular, a

High-Level Panel of Eminent Persons (HLP) was recently convened to advise on the global development framework beyond 2015 and construct the next development agenda. The panel was co-chaired by President Susilo Bambang Yudhoyono of Indonesia, President Ellen Johnson Sirleaf of Liberia and Prime Minister David Cameron of the United Kingdom. The panel included leaders from civil society, the private sector and government.

Through its report, *A New Global Partnership: Eradicate Poverty and Transform Economies Through Sustainable Development*, delivered to U.N. Secretary-General Ban Ki-moon in May 2013, the HLP argues for a series of “transformative shifts,” which are viewed as essential to the post-2015 development agenda.

The elements of the HLP report provide the basis for thinking more carefully around the key post-2015 areas of economic and social policies for African governments. In reflecting on some of the main contributions, suggestions and criticisms of the HLP report, a range of important topics and existing gaps have emerged for future policy-relevant research in Africa. For African development, moving forward in 2014 and beyond includes reflection on some of these major themes as well as an elaboration on how African countries and the world plan to address the next set of goals.

### The Priority

Accordingly, the key priorities for the year ahead are the transformative shifts that must: underpin the new agenda; drive the illustrative goals and related national targets; cover themes of inclusive and sus-



tainable growth, job creation, strategic development finance and cooperation; and strengthen good governance. These focus areas should be at the top of the list for African countries in preparation for the post-2015 agenda.

When it comes to growth, the panel identifies one particular priority for the post-2015 agenda: merging the economic growth and sustainable development agendas. According to the HLP, not only should economic growth focus on generating jobs, but it should also place “sustainable development at the core.” In this way, the notion that sustainability and economic growth in the African context are complements in the growth process is in part a future challenge to source innovative and cheap technologies in order to achieve both efficiency in resource use and economic development. The pressure on the environment—not of any less concern in sub-Saharan Africa than in other regions of the world—renders this linkage between poverty reduction and sustainable development crucial to pursue.

# Post 2015 Special Feature Article:

In addition, an important part of the goal to enhance economic growth is its job creation component. Some of the fastest growing economies at present are African, including Mozambique, Angola and Ethiopia, but it remains an open question whether this growth can and will be sustained and translated into an expansion of the jobs market. Growth has been concentrated in a few sectors and many of these sectors have not seen an increase in jobs, which could be the result of increasing mechanization and demand for more highly-skilled labor. Yet, an enabling environment is critical to job creation.

## Why Is It Important?

Global population projections show that the working-age population is projected to be 600 million larger in 2030 relative to 2015, representing a 20 percent increase. Despite this rapid growth, it is important to note that a larger expansion (of 1 billion individuals) in the working-age population was witnessed for the earlier 1995-2010 period. Crucially, however, the data also reveal that the most prominent jobs challenge for the next 15 years is to be faced by sub-Saharan Africa. Specifically, the net addition to the working-age population for sub-Saharan Africa will reach 21 million per year by 2030 as the number of entrants grows much faster than the number of exits.

Among other regions, Africa is unique in that it is facing a demographic dividend. As the HLP notes, the rapid growth of the continent's youth labor force brings an especially difficult challenge—preventing unemployment for these millions of young Africans: "As more young people enter the work force.....Africa is set to experience (a) 'demographic dividend'..... But young people in Africa, and around the world, will need jobs—jobs with security and fair pay—so they can build their lives and prepare for the future" (U.N. High-Level Panel of Eminent Persons on the Post-2015 Development Agenda 2013).

The African youth labor force (ages 15-24) is currently reaching a peak in many countries that have had rapid fertility decline. While these youth populations are large, these populations have stopped growing in many countries with annual growth

rates having fallen from peaks of around 4 percent in the 1970s to roughly 0 today. In Africa, youth labor force growth rates will remain close to 2 percent for several decades. This relatively high growth in the youth labor force in Africa reinforces the urgency of creating country-level growth paths that are job generating.

In terms of strategic development finance and cooperation, the panel points strongly to the excess levels of global savings currently in the global economy, that is set to reach about \$18 trillion in 2013. The most important source of long-term finance will therefore be private capital coming from major pension and mutual funds, sovereign wealth funds, private corporations and other investors, including those in middle-income countries where most of the world's new savings will emanate from by 2030. African countries need to be cognizant of these trends in global finance.

A final major concern focuses on the strengthening of good—and more importantly effective—governance. A number of African countries are plagued with financial mismanagement. Governance has a serious impact on a country's budget and has implications for where funds are channeled as well as how those funds are spent. In a number of countries, there is often a large budget that is not well spent, and a sizeable proportion is returned to the fiscus due to mismanagement of funds. Governance therefore requires careful monitoring, evaluation and guidance, while the approach followed must take account of the particular country context.

## What Should Be Done in 2014

The development community has been trying to address the aforementioned and many other obstacles to growth for decades with varied results. So, looking ahead, the panel calls for a new global partnership incorporating governments, civil society and the private sector to think collectively and differently about ending poverty (U.N. High-Level Panel of Eminent Persons on the Post-2015 Development Agenda 2013). In order to address unemployment, enhance sustainable development and tackle social development challenges, the HLP's call for a global partnership is unique.

# Post 2015 Special Feature Article:

As noted above, another key challenge for African governments will be their ability to optimally mobilize foreign private savings in a manner that funds local economic development initiatives. Particularly for those fast-growing African economies such as Angola, Mozambique, Ethiopia, Ghana and so on, there is a unique window of opportunity—as African



optimism is at an all-time high in global markets—to access these foreign capital markets around the world. Emerging market capital in particular, with an appetite for slightly higher risk premiums, should be targeted by African governments seeking to pursue an investment-led growth path. As explored in more detail elsewhere in *Foresight Africa 2014*, more proactive engagement between African governments and African firms with emerging market financial institutions is essential in unlocking nontraditional portals of finance for economic growth and development.

The notion that other sustainable development decisions, ideas and actions should be incorporated into one world-wide agenda is embedded within the notion of a global partnership. As a subset of this notion, the HLP argues for the continuation of external funding to developing countries with aid targets and goals to remain intact. Within the African context, this is crucial given that the majority of recipients within the ODA and development finance space are low-income economies or those countries classified as “fragile states.”

In addition to approaching development from a global partnership perspective, the HLP recognizes and puts particular emphasis on the fact that the complex obstacles countries face vary from those of their neighbors. Thus, in terms of an inclusive economic growth agenda, discussions within the post-2015 milieu have argued that economic growth challenges, constraints and opportunities differ by country depending on initial conditions. Within the continent, the pursuit of an inclusive economic growth agenda could involve a contrasting set of interventions, ranging, for example, from a more optimal industrial policy agenda to productivity-enhancing measures in agriculture or even the pursuit of a modern service sector. However, the fundamentals—in the form of an adequate supply of skilled workers, support for small firms, the capacity to innovate, investment in research and development, a well-developed infrastructure and so on—must underpin an African agenda for inclusive and sustainable economic growth.

Finally, Africa needs to capitalize on its demographic dividend. Policies for creating jobs and inclusive and sustainable growth must be a part of the economic agenda in Africa. If Africa can properly mobilize its young workforce, it can also enjoy the benefits of its new mass consumer market potentially consuming goods and services at scale. This consumer market should be concentrated in those fast-growing and large-population economies such as Nigeria, Kenya and Ethiopia, but this opportunity is partly African and partly global. The challenge, however, remains the ability of these various economies to generate a growth and development path that is sufficiently job creating. Put differently, the rise of the mass consumer market in Africa over the next 15 years is conditional on the ability of governments to generate a sufficient quantum of job opportunities for these individuals.

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U.N. High-Level Panel of Eminent Persons on the post-2015 Development Agenda. (2013). *A New Global Partnership: Eradicate Poverty and Transform Economies through Sustainable Development*. Report to U.N. Secretary-General Ban Ki-Moon

## Irina Bokova, Director General of UNESCO on the 2013 - 2014 EFA Global Monitoring Report



This 11th EFA Global Monitoring Report provides a timely update on progress that countries are making towards the global education goals that were agreed in 2000. It also makes a powerful case for placing education at the heart of the global development agenda after 2015. In 2008, the EFA Global Monitoring Report asked – ‘will we make it?’ With less than two years left before 2015, this Report makes it clear that we will not.

Fifty-seven million children are still failing to learn, simply because they are not in school. Access is not the only crisis – poor quality is holding back learning even for those who make it to school. One third of primary school age children are not learning the basics, whether they have been to school or not. To reach our goals, this Report calls on Governments to redouble efforts to provide learning to all who face disadvantages – whether from poverty, gender, where they live or other factors. An education system is only as good as its teachers. Unlocking their potential is essential to enhancing the quality of learning. Evidence shows that education quality improves when teachers are supported – it deteriorates if they are not, contributing to the shocking levels of youth illiteracy captured in this Report.

Governments must step up efforts to recruit an additional 1.6 million teachers to achieve universal primary education by 2015. This Report identifies four strategies to provide the best teachers to reach all children with a good quality education. First, the right teachers must be selected to reflect the diversity of the children they will be teaching. Second, teachers must be trained to support the weakest learners, starting from the early grades. A third strategy aims to overcome inequalities in learning by allocating the best teachers to the most challenging parts of a country. Lastly, governments must provide teachers with the right mix of incentives to encourage them to remain in the profession and to make sure all children are learning, regardless of their circumstances. But teachers cannot shoulder the responsibility alone. The Report shows also that teachers can only shine in the right context, with well-designed curricula and assessment strategies to improve teaching and learning.

These policy changes have a cost. This is why we need to see a dramatic shift in funding. Basic education is currently underfunded by US\$26 billion a year, while aid is continuing to decline. At this stage, governments simply cannot afford to reduce investment in education – nor should donors step back from their

# Special article : EFA Global Monitoring Report 2013 - 2014

funding promises. This calls for exploring new ways to fund urgent needs.

We must learn from the evidence as we shape a new global sustainable development agenda after 2015. As this Report shows, equality in access and learning must stand at the heart of future education goals. We must ensure that all children and young people are learning the basics and that they have the opportunity to acquire the transferable skills needed to become global citizens. We must also set goals that are clear and measurable, to allow for the tracking

and monitoring that is so essential for governments and donors alike, and to bridge the gaps that remain.

As we advance towards 2015 and set a new agenda to follow, all governments must invest in education as an accelerator of inclusive development. This Report's evidence clearly shows that education provides sustainability to progress against all development goals. Educate mothers, and you empower women and save children's lives. Educate communities, and you transform societies and grow economies. This is the message of this EFA Global Monitoring Report.

## Mathematics and Science Education in Africa:

African Institute for Mathematical  
Sciences (AIMS) Calls for Action

Einstein Initiative

## LET AFRICA SHINE IN MATHS, SCIENCE AND INNOVATION

### BACKGROUND

Africa's young women and men are its most precious resource. Unlocking their talent is the key to Africa's future. Nowhere is such talent more effective and relevant today than in the mathematical sciences, which are foundational to every aspect of modern science, society and the economy. From the internet and communication to financial systems, epidemiological modeling, materials science and resource management, Africa urgently needs its own scientific and technical community, capable of developing innovative solutions to the continent's problems and driving its future prosperity.

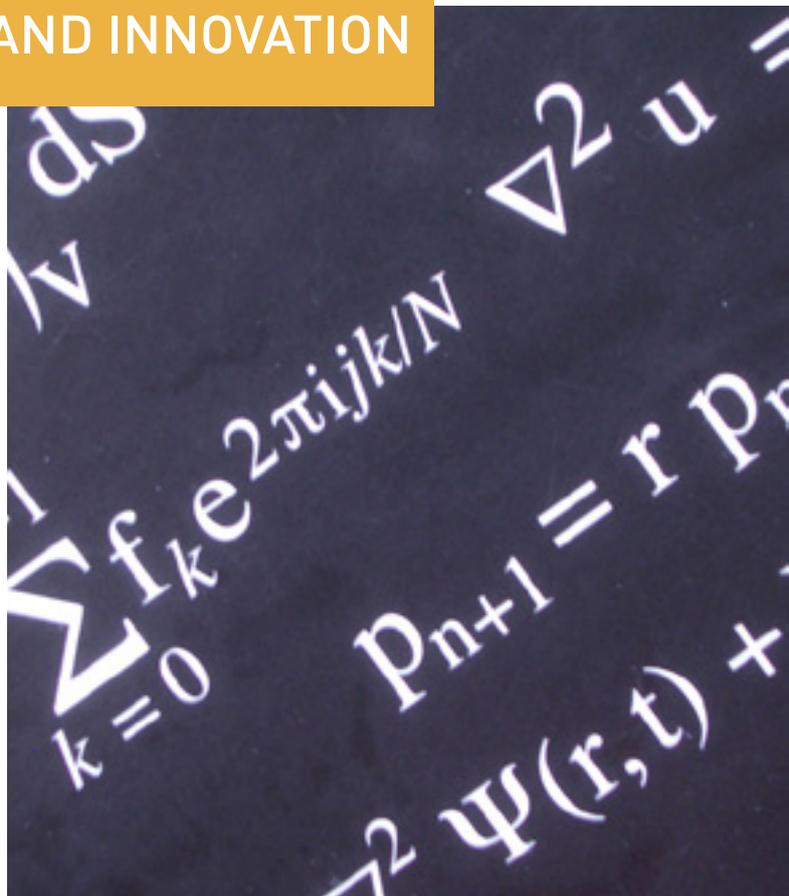
Traditional approaches to development have focused on basic needs. The United Nations' Millennium Development Goals call for universal primary education. But today's economic powerhouses built their economies on advanced skills, through investments in science, technology, engineering and mathematics (STEM) training. South Korea, for example, took this

path in the 1980s and, within a generation, became a member of the G20, rising to 12th in the world in terms of GDP

### A WORKING MODEL FOR AFRICA

The African Institute for Mathematical Science (AIMS) is a pan-African network of centers of excellence for post-graduate training, research and outreach in the mathematical sciences. Its goal is to build science in Africa, by providing young, talented African women and men with the knowledge, inspiration, global networks and sense of responsibility to apply their skills to solving key African challenges.

For example, climate change contributes increasingly to natural disasters, poverty, famine, conflict and disease, all of which have a disproportionate impact on Africa's women and children. Just imagine the impact if Africans were to develop sustainable energy on a



# Call for Action : LET AFRICA SHINE IN MATHS, SCIENCE AND INNOVATION

large scale, or lead cutting-edge research that would combat disease, or improve food security while also reducing the burden on African women who do the majority of agricultural work.

All of these advances require female and male scientists, engineers and technologists who know how to apply their skills and ideas in Africa. We are working hard towards this goal, while recognizing that much still needs to be done. For instance, although women constitute half of Africa's population, they are not equally represented in the field of STEM. In spite of these challenges, there is no reason why, in 2013, decades after colonial rule has ended, African countries cannot develop their own diverse human capital. Today, Africans can solve Africa's problems, and in so doing, transform their continent from a lagging one to a leading one.

In fact, we know that since 1990, the International Organization for Migration estimates that 20,000 African professionals leave the continent every year. To fill the human-resource gap created by this brain drain, Africa employs up to 150,000 expatriate professionals at a cost of US\$4 billion a year. Some 35 percent of overseas development aid is spent on them.

It is time for Africa to stop relying on others and to show what it can do for itself.

## THE CALL

We call on all African governments, academics, industry and civil society organizations; all STEM organisations; the African Union and all its regional affiliates; the African Development Bank; the international development community; and global insti-

tutions such as the United Nations, the International Monetary Fund, the World Bank and the G20:

1. To recognize the importance of mathematical science and STEM initiatives to Africa's growth and success;
2. To advocate and commit resources for scientific training as the foundation for innovation and "homegrown" solutions to Africa's development challenges;
3. To capitalize on the untapped contributions of under-represented groups in STEM through strategic investments that will increase access to opportunities in STEM for women, girls and marginalized groups;
4. To foster mathematical sciences programs as a driver of quality and relevance across the tertiary education system;
5. To promote the AIMS model as an example of efficiently and cost-effectively unlocking scientific and technical talent in Africa;
6. To advocate for the inclusion of STEM training in the RIO+20 Sustainable Development Goals, which will guide international development agendas and strategies for the next generation;
7. To consider AIMS as a continental secretariat for promoting STEM initiatives within the context of African development;
8. To help AIMS create a high-level global forum showcasing Africa's diverse scientific and technical talent.

## SIGNATORIES: ENDORSED BY:

Date: Thursday, June 27th, 2013 All staff and Board of the AIMS

Place: Muizenberg, Cape Town, South Africa Network

Read By: Thierry Zomahoun, Executive Director, AIMS-NEI



## Building a future for mathematics in Africa

The two branches of the African Institute for Mathematical Sciences (AIMS) in Senegal and South Africa have recently held graduation ceremonies, bringing the total number of alumni of this ambitious project to 450 since it was started in 2003.

A third AIMS centre is scheduled to open in Ghana in September, followed by a fourth in Ethiopia this year. More money could spawn further AIMS centres across the continent – leading to a pan-African network of thousands of well-trained alumni, says an article in *Science*.

The project's founder, Neil Turok, hopes for a network of 15 AIMS institutes, and believes that excellence in mathematics is one of the keys to development for Africa.

«I really think that will transform development,» says Turok, a South African-born mathematician who heads the Perimeter Institute for Theoretical Physics in Waterloo, Canada.

«It would cost US\$100 million over the next ten years – that's about 0.003 per cent of Africa's total aid budget.»

He has ambitiously dubbed the project the AIMS Next Einstein Initiative – the idea being that the 21st century's most revolutionary mathematicians could be Africans.

Currently, AIMS does not charge tuition fees, and women make up 30 per cent of its student body.

The first branch, AIMS South Africa, was founded in 2003 just outside Cape Town, while the Senegalese branch is housed on a small nature reserve in M'bour, 2.5 hours south of the capital, Dakar.

The Senegalese branch has 31 students from across Africa. Top lecturers from around the world come to M'bour to teach for three weeks at a time. They make themselves very accessible, and discussions with students often continue during the communal meals and into the night.

«It's amazing and very inspiring,» says Nigerian student Odumodu Nneka Chigozie. But it is also «very hard work», says another student, Diogène Pongui, from the Republic of the Congo.

Students come for several months of immersion in high-level mathematics. For many of them, the focus on problem-solving rather than rote learning is like «shock therapy», Turok says.

«The first two months, they are typically very unhappy. Then a light bulb goes on, and they realise they can learn by playing and discovering.»

Several AIMS Senegal students have already lined up PhD training at universities in Europe and North America.



## First Spinoff of African Math Institute Takes Root in Senegal

### Work hard, play hard.

AIMS Senegal students Diogène Pongui and Odu-modu Nneka Chigozie, and lecturer Abdellah Sebbar M'BOUR, SENEGAL—Golden sand, the Atlantic Ocean, beach volleyball—these are just occasional distractions for the 31 students from all over Africa who are doing 10 months of intensive training at the newest branch of the African Institute for Mathematical Sciences (AIMS). A few steps from the beach on a small nature reserve in this town 2.5 hours south of the Senegalese capital, Dakar, the institute is their home, cafeteria, and lecture hall. Top lecturers are flown in from around the world to teach; in this first year, two Fields Medal winners were among them. Life at AIMS Senegal is mostly “very hard work,” says Diogène Pongui, a student from the Republic of the Congo.

AIMS Senegal is the little sister of AIMS South Africa—a similar institute founded in 2003 just outside Cape Town—and part of a story that has captivated mathematicians and triggered an outpouring of support in money, time, and brainpower. The institutes are the brainchild of Neil Turok, a South African-born mathematician who heads the Perimeter Institute for Theoretical Physics in Waterloo, Canada.

Turok, whose parents were jailed as anti-apartheid activists, believes excellence in math is one of the keys to development in Africa. He has a dream to create a network of 15 AIMS institutes around the struggling continent. He ambitiously dubbed it the

Next Einstein Initiative—the idea being that the 21st century's most revolutionary mathematicians might well be Africans (SCIENCE, 2 May 2008, p. 604).

At first the dream proved harder to realize than Turok hoped. Despite lots of sympathy, “we were often at the brink of bankruptcy during the first few years,” he says. Big donors tend to shun higher education projects, which aren't among the U.N.'s Millennium Development Goals (wrongly, Turok says). The plan to open a second AIMS institute in Nigeria, Africa's most populous country, was stranded over differences with the local partner, the African University of Science and Technology in Abuja. Small-scale by nature, AIMS didn't feel at home in the grandiose plans for the university, a World Bank project. AIMS also insists on not charging tuition and recruiting women as 30% of its student body.

The past 2 years have brought a “transformation,” Turok says. Several big donors came through—most notably the Canadian government, which pledged \$20 million in 2010 to expand the network. The money supports not just the Senegal franchise but also one in Ghana, and a fourth slated to launch in Ethiopia this year. Each will be co-administered by local universities.

In Senegal, the plan found a willing ear in then-president Abdoulaye Wade, whose government donated €1 million for a new building that will replace the current, modest dwellings loaned from a French institute. Wade was defeated in elections in February

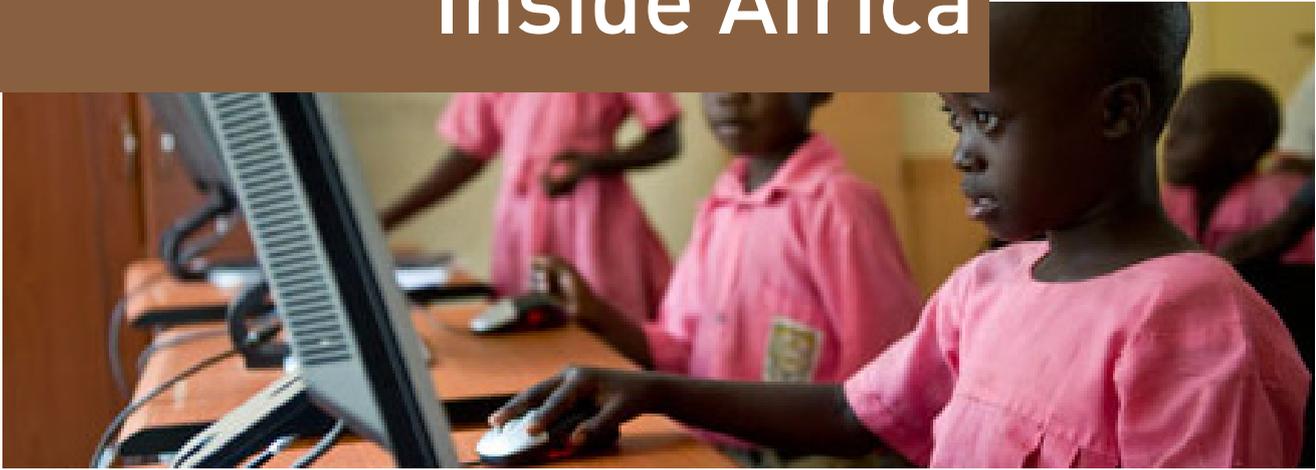
2012, but his successor, Macky Sall, is a geological engineer and a science supporter as well, says Mamadou Sangharé, a mathematician at University Cheikh Anta Diop in Dakar and the president of AIMS Senegal.

Despite some differences from AIMS South Africa—both English and French are spoken here, and the atmosphere is a bit more relaxed, Turok says—the idea behind AIMS Senegal is the same. Students come for months of day-and-night immersion in high-level mathematics. For many students, the focus on problem-solving rather than rote learning is like “shock therapy,” Turok says. “The first 2 months, they are typically very unhappy. Then, a light bulb goes on, and they realize they can learn by playing and discovering.”

To avoid distractions, AIMS deliberately picked this regional city as a home; Dakar, the capital, has more intellectual life but also a famed music and nightlife scene. The students have mostly stayed focused, Sangharé says, and have grand ambitions. Several have lined up Ph.D. training at universities in Europe and North America.

Perhaps the main attraction here is the lecturers: internationally renowned mathematicians, who each come to spend 3 full weeks. They’re extremely acces-

sible; discussions often continue during the communal meals and into the night. “It’s amazing and very inspiring,” says Nigerian student Odumodu Nneka Chigozie. It’s a big investment for the faculty, says Abdellah Sebbar of the University of Ottawa, who did his stint earlier this year—especially because he has three children and a wife with a job of her own. But Sebbar, who hails from Morocco, says that as an African, “I want to be in this process for the long run.” Turok, too, has plenty of plans for the long run. After next month’s graduations here and in South Africa, AIMS will have generated 450 alumni. With more money, there could be a fifth AIMS, and a sixth, and so on, leading to a pan-African network of thousands of well-trained alumni—including, perhaps, that new Einstein. “I really think that will transform development,” Turok says. And then, as the mathematician takes over from the dreamer: “It would cost \$100 million over the next 10 years—that’s about 0.003% of Africa’s total aid budget.”



## Ethiopia to host fourth African Institute of Mathematical Sciences

[ADDIS ABABA] Ethiopia hopes to become the next African centre of excellence in mathematical sciences, after Ghana, Senegal and South Africa, with the opening of the fourth African Institute of Mathematical Sciences (AIMS) planned for this year.

AIMS, the brainchild of Neil Turok, director of the Perimeter Institute for Theoretical Physics, in Canada, was founded in Cape Town, South Africa, in 2003 as a pan-African centre for postgraduate training and research, providing advanced, broadly applicable mathematical skills to talented students.

A second branch of the institute is set to open in Senegal in September. It was announced in May that the third institute will open in Ghana in September 2012.

Semu Mitiku, acting chairperson of the AIMS-Ethiopia steering committee and dean of the faculty of mathematics at Addis Ababa University, told SciDev. Net that a general understanding has been reached between the steering committee and the Ethiopian government on the establishment of the institute.

A detailed action plan is being put together and construction of the institute is expected to begin following a final go-ahead from the government.

Mitiku hopes the centre will be ready to admit students from around the continent in September 2012. «During its initial phase, AIMS Ethiopia has plans to accept up to 35 students from across the continent,» he said.

The Next Einstein Initiative, a programme set up by AIMS-South Africa to oversee to the setting up of 15 such institutes across Africa, will part-fund the Ethiopian institute. Ethiopia is expected to provide matching funds for construction and also provide the running costs after start-up.

Since 2003, more than 300 students from 31 African countries have received postgraduate degrees from AIMS-South Africa. And in the past six years four Ethiopians per year, on average, have received scholarships from the institute.

«AIMS Ethiopia is at a very initial stage but it is going very well. There is a lot of enthusiasm, and a lot of people are very interested in the project and wish to support it,» said Sarah Jackson, project developer for AIMS-Ethiopia.

Jackson said that training at AIMS-Ethiopia will focus on mathematical modelling applicable to areas relevant to the country's development, such as agriculture and climate change

Amsalework Ayele, a mathematician at Bahir Dar University, Ethiopia, and former AIMS scholarship recipient, said that the opening of an AIMS branch in Ethiopia was an opportunity not just for students but for science professors to learn from the experiences of renowned scientists coming to the institute.

Ultimately it is hoped that there will be 15 such centres of excellence across Africa.

## Interregional grouping of the "Horizons Francophones" project "Basic sciences: information sciences and mathematics"

Issuing region: WEST AFRICA, INTERNATIONAL

The interregional grouping of the "Horizons Francophones" project "Basic sciences: information science and mathematics" of the AUF was held at the École Nationale Supérieure Polytechnique of Yaoundé (Cameroon) from July 1 to 5, 2013.

For one week, the 24 doctoral students selected gathered for intensive training with, on the menu: a presentation of the work's progress followed by a debate, two plenary communications and sessions devoted to writing scientific articles moderated by a panel of professors.

The "Horizons Francophones" project plans to build

the capacities of the university teaching corps of the South countries in teacher and research training. The doctoral students are primarily active teachers in their university of origin or who have a teaching or support to higher education activity, who will be able, thanks to their training, to strengthen the training and research offering at their university of origin.

The "Horizons Francophones" basic sciences project was created following the interregional thematic conference in Yaoundé in March 2011 to meet the needs expressed by the member schools. It aims to reduce the shortage of teacher-researchers in the fields of mathematics and information science in the universities of French-speaking countries in Central Africa, West Africa and the Indian Ocean.



## African centres hope to produce top mathematicians

[CAPE TOWN] Senegal hopes to begin producing world-class African mathematicians with the first of three Africa-based mathematics training centres.

The Senegalese government has committed around US\$1.3 million and donated a plot of land near Mbour on the country's coast for the centre, SciDev Net was told last week.

Two other centres will be set up in Ghana and Ethiopia, according to an announcement by the Canadian government. Canada will provide US\$19 million in funding for all three centres, to be channelled through the Ontario-based Perimeter Institute for Theoretical Physics.

The Perimeter Institute's director, South Africa-born Neil Turok, founded the African Institute for Mathematical Sciences (AIMS), in Cape Town, nine years ago and the new centres will be based on the same model.

AIMS in Cape Town has already trained over 300 mathematicians from across Africa bringing recent graduates to a level where they can compete for postgraduate degrees at the world's top universities within the duration of a year-long course.

More than half of AIMS alumni went on to do pos-

tgraduate degrees at South African universities, while others secured places at institutions in Europe and the United States.

Teaching is provided both by local researchers and visiting lecturers who often donate their time for free.

«One of the reasons AIMS works is that people are prepared to contribute for the good of the cause,» said Barry Green, the director of AIMS in Cape Town. He said his institute had a surfeit of willing lecturers. He anticipated few problems attracting foreign lecturers to less developed parts of Africa.

AIMS Senegal will draw on the country's own academic linkages, particularly with France, to attract teachers, said Mamadou Sangharé, director of AIMS Senegal.

«We have a partnership with many French universities including Paris VI, Paris XI and the École Normale Supérieure, in Paris. In addition, we will employ local teachers. So it is not only foreign teachers who are coming,» Sangharé said.

Patrick Dorey, a mathematician from the UK-based Durham University, who has returned to Cape Town several times to lecture at AIMS, said the students' enthusiasm made teaching at AIMS «a very rewarding experience».

If this is replicated at the new centres, «I don't think there will be a problem in finding lecturers to attend and to return,» he said.

The centres are the brainchild of Turok, who wants to see a generation of top-class scientists hailing from Africa.

The aim is to have 15 AIMS centres across the continent by 2020 – a vision entitled the «NextEinstein».

The Senegalese centre's first intake of around 35 students will be for the 2011–12 academic year.

## Easy-Maths contributes its support to the promotion of math teaching in Cameroon

Education is the key to development. When a given society has trouble taking off, analysts generally look at its education system. Cameroon is among the poorest states on our planet. It belongs to the category of HIPC (Heavily Indebted Poor Countries) according to the classification of the Bretton Woods institutions. Its education system suffers from various ills, from the lack of basic education infrastructures to an insufficient number of qualified officers, etc. It is in this particularly difficult context that a Douala-based NGO works daily in primary schools and upper and lower secondary schools, with the goal of offsetting the catastrophic consequences of the multifaceted crisis that is battering the Cameroon education system. We met those in charge of this organization to learn more about their activities. The management of Easy-Maths was eager to answer our questions.

**Africa & Science:** Are you satisfied with the quality of the math programs in Cameroon's secondary schools?

We think that the math programs of our upper and lower secondary schools could be improved. There are ideas that should be introduced so that the students that go on to the university from secondary school are not totally out of step as seems to be the case



today.

**Africa & Science:** Do you think that the university programs and particularly those at the École Normale Supérieure are of a kind to favor the dissemination of mathematics to young people?

The university programs have been left behind as time has gone by and should be remodeled to take into account the evolution of science and the world. The mathematics that we study and teach today in our universities does not serve Cameroon's develop-

ment and does not enable us to think of how to solve the problems we encounter in our entourage.

Africa & Science: Your organization works in the field and aims to provide substantial support to teachers as well as students. What problems do you have? How can the Cameroonian and African diasporas help you?

Our organization primarily has one objective: promoting mathematics. This means several things:

- making mathematical knowledge accessible to every learner or teacher who needs it. To do so, our Internet site [www.easy-maths.org](http://www.easy-maths.org) makes it possible to reach this objective. Nonetheless, we have encountered problems digitizing documents to put on line. Many sections are still not digitized because of the volume of work to be done to make the documenta-

tion available. In this respect, the Cameroonian diaspora could help us to pay volunteer students so that they digitize courses (in the Latex format) that we will then correct to put on line.

- popularizing mathematics through games: this is the approach we have taken for over two years: we organize math competitions on a regional scale, but we would like to cover the national territory in the years to come. The search for sponsors has become a necessity to award the best students. Once again, the diaspora could facilitate the task of sponsoring and could perhaps be a donor to motivate our young brothers.

Interview by:

Moses Chi  
Africa & Science



## Nigeria: no scientific success without mathematics

The Nigerian government must invest in mathematics education if the country is to become scientifically literate, according to one of Nigeria's top mathematicians.

Sam Ale, director of the National Mathematical Centre in Abuja, Nigeria, said the country needs to spend four billion Naira (US\$31 million) over 13 years if it is to achieve its goal of being in the top 20 world economies by year 2020.

Ale's plan, announced during the 5th meeting of Nigeria's International Mathematics and Sciences Olympiads Committee, focuses on demystifying mathematics for both teachers and students.

Nigeria currently ranks as one of the least mathematically literate nations, according to the International Mathematical Union (IMU).

Reuben Ayeni, president of the Mathematical Society of Nigeria, told SciDev.Net that the investment could be used to fund scholarships for students to study mathematics at a tertiary level. He also suggested it could fund teacher- and student-driven research into effective methods of teaching mathematics. The National Mathematical Centre, in conjunction with Nigeria's federal and state education ministries, is also looking into this area.

Chris Ikporiko, vice chancellor of the country's Niger Delta University in the southern state of Bayelsa, identified the «bad foundation» in science and mathematics at secondary school level as the reason why art-based courses dominated the nation's universities, according to a report in the Financial Standard.

Other suggestions discussed at the meeting include creating a joint degree programme run by the National Mathematical Centre in conjunction with the National Open University of Nigeria, and teacher workshops funded by Nigeria's Petroleum Technology Development Fund.

Further afield, the African Millennium Mathematics Science Initiative is tackling the problem by offering fellowships for research and postgraduate mathematics teaching at any university in sub-Saharan Africa.

## The JICA trains 37,000 Nigerian teachers in mathematics and science

The Japanese International Cooperation Agency (JICA) trained, between 2006 and 2009, 37,000 teachers in three pilot states in Nigeria (Niger, Plateau and Kaduna), in the framework of the Strengthening Mathematics and Science Education project in Nigeria (SMASE).

JICA's principal representative in Nigeria, Tetsuo Seki, stated during a course the agency organized for elementary school teachers in Abuja, that teachers had been chosen to take part in a training sessions for trainers in 34 non-pilot states.

Since 2006, JICA has been steering the SMASE project, which is currently in its second phase of training primary school teachers, using the student-centered method that stresses activities, experiments and improvisation, he explained.

The project's objective, he added, is to strengthen the aptitudes of primary school teachers to give student-centered courses in math and science.

The training program will offer the participants opportunities to share knowledge and skills between the teachers, but also between the students.

Masami Isoda, a professor at Tsukuba University in Japan, gave the course on the theme: "The Japanese approach to teaching mathematics to help children learn math by themselves and for themselves."

Masami pointed out that the Japanese approach to problem-solving was one of the best in the world to



develop the teaching and learning of mathematics. The philosophy of JICA, which aims at working with the Federal Ministry of Education and other players, will lay the foundations of an alternative phase of training Nigerian teachers, to the children's benefit.



## CERN Scientist promotes physics teaching in Africa

(Courtesy of New African Business Magazine: October, 2013 Edition)

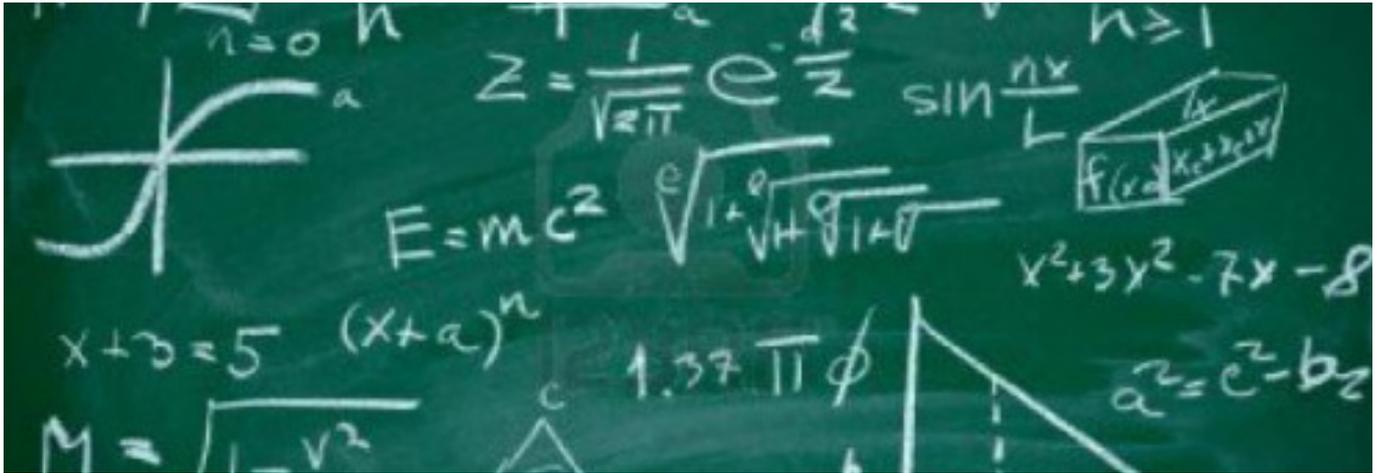
Professor Tejinder Virdee was one of the team that played a key part in the discovery of the Higgs Boson particle in Geneva. Originally from Kenya, he is keen to see science develop in the region. A winner of the 2013 Fundamental Physics prize, he used his money to bring science teachers from Africa to the Geneva lab. They took part in CERN's long-running teaching programme, with participants from over 50 countries.

To a large extent, the international community has emphasized primary education in Africa at the expense of higher education and not giving strong emphasis on support for science and technology, many believe. Britain's Institute of Physics (IOP), which has nine programmes for teacher training in sub-Saharan Africa, focuses on secondary education. It believes there is a big drive at primary level and quite a lot of focus in supporting university level. However, children need support to get from primary level to the university level.

Science teachers from Uganda and Kenya who have been on the CERN teaching programme have come back inspired and enthusiastic to pass the message

on. They say the cutting-edge scientific research at CERN is becoming increasingly relevant. It gives them an insight, and they can also start probing into the questions CERN is trying to answer. They believe those questions have an impact on the advances in technology, telecommunications and it is high time Africa took up such projects. Prof. Virdee is looking at ways of getting more involved with projects and institutions already working on improving science education in Africa.

## Capacity Development for Science and Mathematics Education in Africa Partner(s)



### Governments:

Government of Japan - Japan International Cooperation Agency (JICA)  
Government of Ghana - Government of Ghana  
Government of Japan - Japan International Cooperation Agency  
Government of Japan - Ministry of Foreign Affairs  
Government of Kenya - Government of Kenya  
Government of South Africa - Government of South Africa

### UN System: Other intergovernmental organizations:

Assoc. for the Dev. of Education in Africa (ADEA) (Tunisia)

### Description/achievement of initiative

This initiative will contribute to expansion and enhancement of science and mathematics education in Africa, and strengthen and expand the network already formulated by JICA and African Countries. Also by the participation of ADEA (Association for the Development of Education in Africa), recommended by BEGIN (Basic Education for Growth Initiative) which introduced by Japanese Government.

## Strengthening of Mathematics and Science Education - Western, Eastern, Central and Southern Africa (SMASE-WECSA)

### Students enjoy "Active Participation" in a Chemistry lesson

JICA started its first project in Africa to assist in establishing institutionalized in-service training for mathematics and science teachers in Kenya in 1998, under the "Strengthening of Mathematics and Science in Secondary Education (SMASSE)." Since many African countries face common problems in mathematics and science education, namely, the poor performance of students in those subjects and the necessity of transforming lessons from teachers-centered to learner-centered, it was recognized that the Kenyan experiences should be shared with other African countries to strengthen the capacity of teachers to teach mathematics and science more effectively. In view of the situation above, the SMASE - WECSA Association was established in 2001 with 11 countries in Africa as a network to share experiences among member countries. The number of member countries has increased to 33 by July 2009. Based on Kenya's experience, other African countries also launched similar projects to deal with their challenges in mathematics and science education. As of July 2009, 12 projects have been launched with the

aim of improving mathematics and science education.

As JICA attaches considerable importance to developing the capacity of partner countries to deal with their problems on their own, JICA has been supporting African initiatives to share among partner countries a variety of experiences and know-how accumulated through the projects and to learn from each other. JICA believes that this kind of support will enable African countries to develop the capacity to learn from peers in Africa and to develop new ways of solving their own problems.



## African Union honors outstanding African scientists through the Kwame Nkrumah Scientific Awards

Addis Ababa, 30 January 2014 - The African Union Commission has awarded USD100 000 each from the Kwame Nkrumah Scientific Awards to two outstanding African scientists. The presentation took place today, January 2014 at the African Union Headquarters in Addis Ababa, Ethiopia in the Framework of the 22nd Ordinary Session of the Assembly of Heads of State and Government. The Commissioner for Human Resources Science and Technology, Dr. Martial De Paul Ikounga announced this year's winners.

The prizes were handed out by the newly elected Chairperson of the African Union and President of the Islamic Republic of Mauritania, Mr. Mohamed Ould Abdel Aziz to Professor Andre Batiano, from Burkina Faso winner in the field of Earth and Life Sciences and Professor Kayode Oyebode Adebawale, from Nigeria, winner in the field of basic science, technology and innovation.

Dr. Nkosazana Dlamini Zuma congratulated the two laureates and said Science and Technology have to play a very important role in solving challenges in infrastructure, development and energy among others. "The Kwame Nkrumah award program is a key flagship program of our Union, it aims to raise awareness on the use of science of technology in our continent" she added. Dr. Dlamini Zuma also thanked the partners, particularly the European Union and the numerous Academy of Sciences for working with the Commission on these projects.



The African Union Kwame Nkrumah Scientific Awards, formerly known as the African Union Scientific Award Program, aims to honor top African scientists for their scientific achievements, valuable discoveries and findings. It is an opportunity to honor the memory of the great Pan-Africanist and first President of the Republic of Ghana, Dr. Kwame Nkrumah.

Established in September 2008, this program is part of the African Union Commission's commitment to ensure science and technology contributes to the sustainable development efforts of the African Union. The Human Resource Science and Technology Department of the Commission, implements the program.

## (Courtesy BBC Skills Wise for Life: Knowledge and Learning Beta),

December 2013.

### Can the Singapore method help your children learn maths?

### What can Africa learn from this?

Singapore teaches maths better than most countries including the UK, according to international rankings for secondary pupils.

The difference starts at an early age.

There are many reasons but one key factor is its step-by-step approach that can be used at home or in the classroom.

Young children are happy playing with blocks or drawing pictures. But they can find number symbols, like  $5 + 2 = 7$ , mystifying.

So the Singapore method begins by allowing children to start learning about maths by playing with real objects, blocks or cut-out pictures.

They build confidence with the basic ideas of adding and taking away. There is then a second stage of drawing pictures representing the objects. And only later do they gradually start to add numbers to their drawings.

Maths without symbols?

Straight to the symbolic - a leap too far for many children?

In education systems in the UK, pre-school children

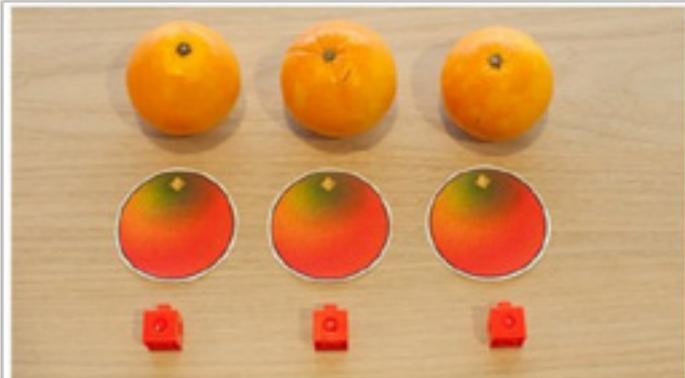
are often introduced to maths and to number symbols at the same time. For instance through brightly-coloured counting books which show a picture of an apple - or a kite or a butterfly - next to a '1'. Two new things next to a '2'. Three new things next to a '3'. Culminating in a loose group of ten things next to a '10'.

But number symbols like 5 or 10 as well as symbols like + or - are often difficult for children to understand. And if they are introduced too quickly, there is a risk that young children will struggle and from then on never fully recover their confidence in maths. Failing repeated tests on symbolic sums at school only deepens their anxiety and they soon learn that maths is not for them.

The Singapore method illustrated in more detail below goes more gradually - from handling «concrete» things, to drawing one-to-one «pictorial» iconic representations of them, to eventually understanding and using the mysterious «abstract» symbols with confidence.

# Our Maths lesson

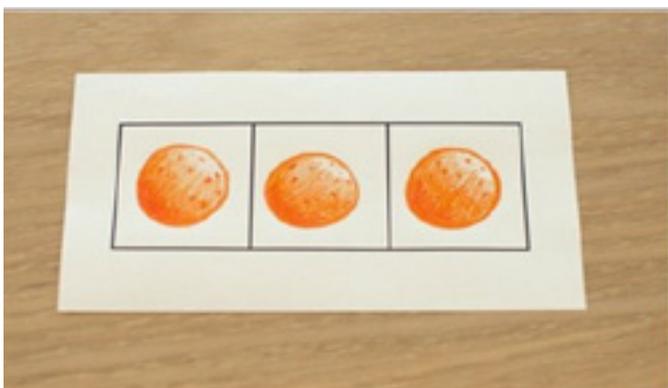
## 1. Lining up objects in a row



Children start by counting familiar things using blocks or cut-out pictures they can physically line up in a row. For instance counting pieces of fruit, their own ages, or people in the room. With one block or cut-out picture for each orange, or year, or person.

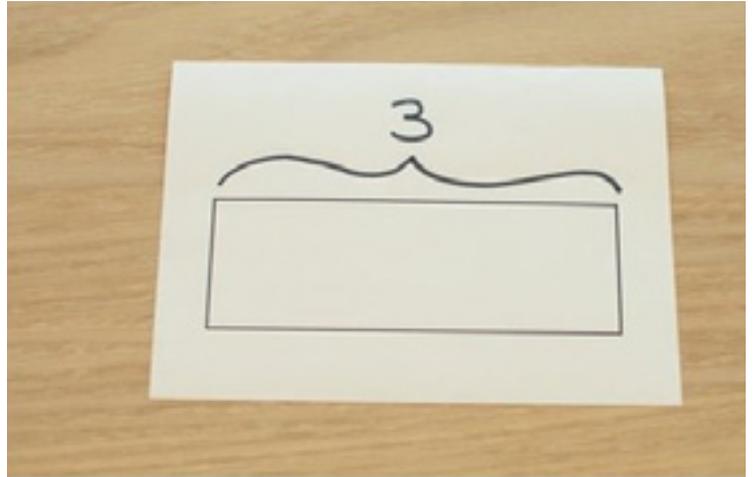
They can learn most basic maths concepts with these objects. For instance add objects to the row, or take them away, to understand adding and subtraction. Or split a row in the middle to understand halving.

## 2. Drawing boxes around pictures



Then children start to draw pictures on paper of the things they are counting, with a box around each picture. So there's one box for each thing they are counting. Over time they drop the pictures and just draw the boxes.

## 3. Labelling the boxes



In the 1960s American psychologist Jerome Bruner put forward a theory that people learn in three basic stages: by handling real objects, through pictures, and through symbols.

Jerome Bruner



Bruner said symbols are «clearly the most mysterious of the three.» In the 1980s Singapore developed its model method based on Bruner's theory.

Gradually, once they are confident with drawing boxes to count objects, children start to write the number of boxes as a figure above the drawing. Eventually they no longer need to draw all the boxes. They just draw one long box or bar and label it with the number. This step away from one-to-one representations to symbols is crucial and it may take a year or more for some children to become confident with it. But the benefits later on are worth it.

## The Singapore Model Method

This model of numbers as labelled bars is known as the Singapore model, and it's a tool children can use to understand almost any concept in maths, inclu-

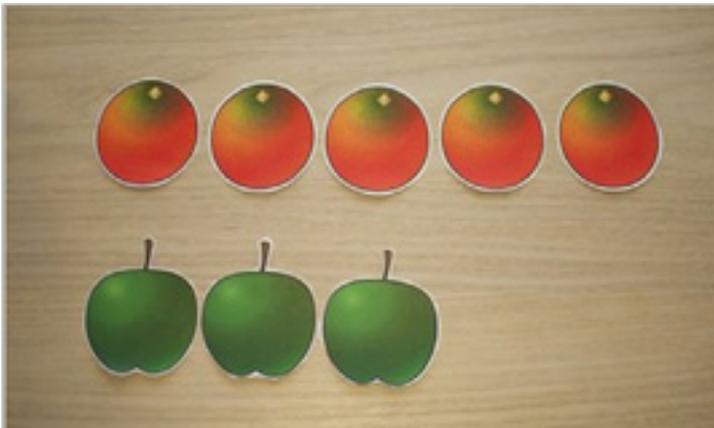
ding multiplication and division and even algebra.

Professor Lianghuo Fan, former editor-in-chief of Singapore's maths textbooks, has researched the reasons for Singapore's success in maths. As he puts it: «People have different views about the reasons for Singapore students' performance, but one thing that is universally agreed is that the Singapore model method is key.»

You can see examples of different stages of the model in this slideshow:

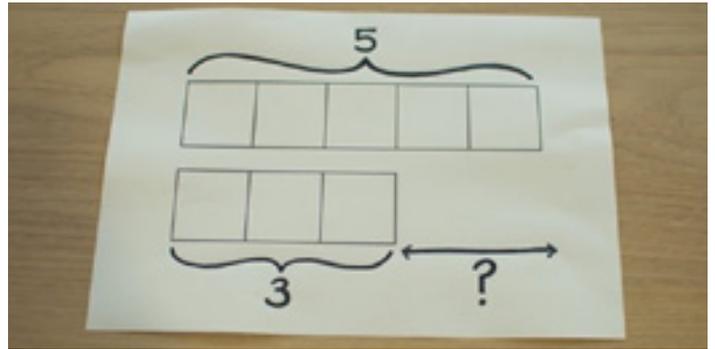


Imagine you have five oranges and three apples, how many more oranges than apples?

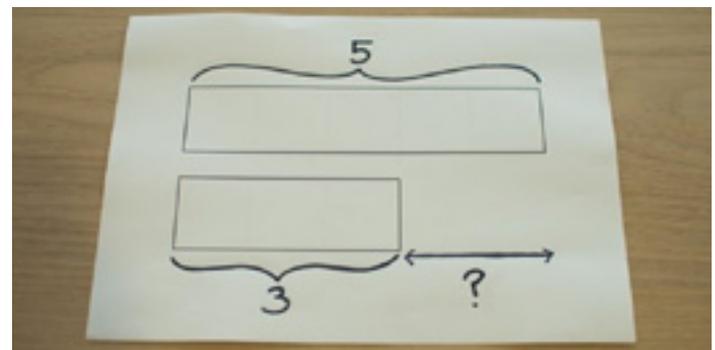


At first children model the problem with physical objects they can move around: like these cut-out pictures.

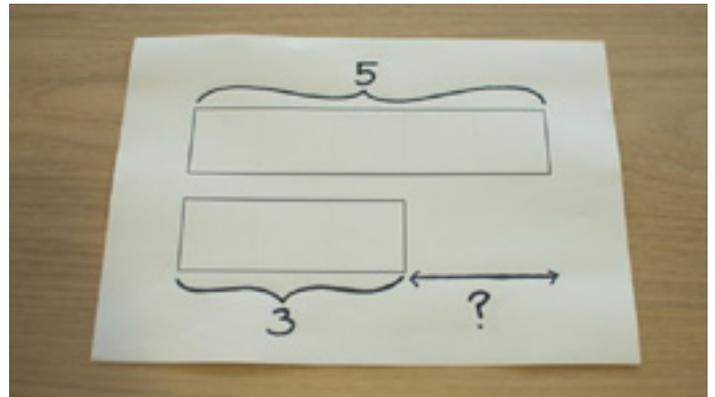
After a few months they start to draw pictures of the problem to help them think about it.



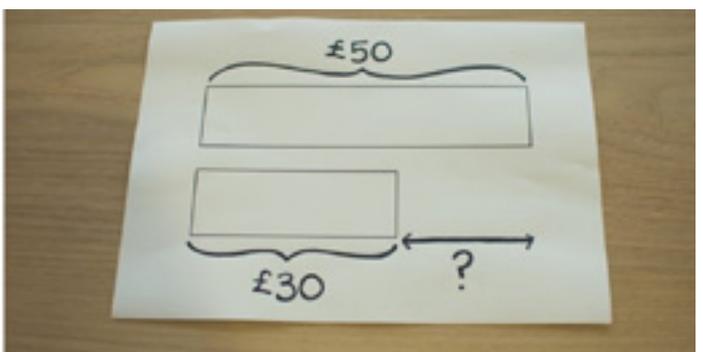
Over time children drop the pictures and just draw boxes. Then they start adding numbers as labels.



Once children are confident with the meaning of the number symbol they no longer need to draw all the boxes. However they know they can always draw the boxes in again if they need to convince themselves.

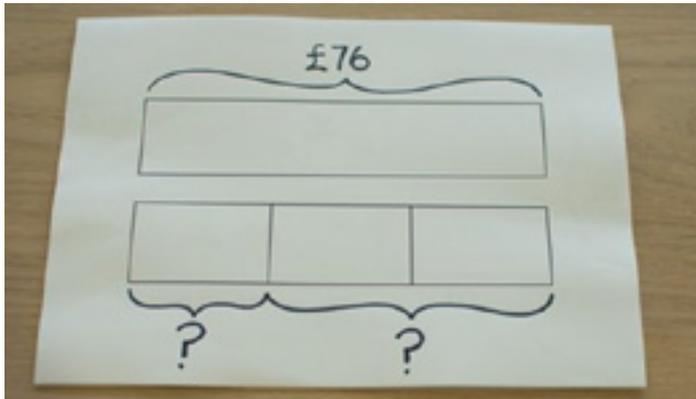


How much change if you pay for a £30 shirt with a £50 note? The model can be used to help visualise

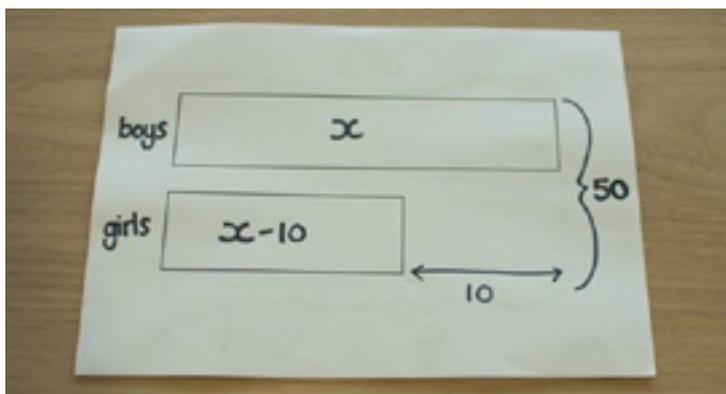


almost any maths problem.

Three people want to split a restaurant bill of £76. How much for a couple who want to pay together? The model helps break the problem down. First divide £76 by 3. Then times the answer by 2.



In a year group there are 50 children. There are 10 fewer girls than boys. How many boys? The model can help visualise the unknown quantity. You can see that  $x + x - 10 = 50$ . If you add the 10 you get  $x + x = 60$ . So  $x = 30$ .



10 top tips for trying the Singapore model method with your kids:

Count things with objects

Try counting familiar things together like the number of people in the room, kids' ages, or goals in football matches, using concrete objects like counters, buttons or small stones, lining them up one by one. If nothing's to hand use fingers.

Get some interlocking cubes

Interlocking cubes are great and can be bought for a few pounds, or your child's nursery or school may be able to lend you some. Try carrying round a few to count things when you're out and about. They are also good for kids to play with to keep them occupied.

Use cut-out pictures

Draw pictures on paper and cut them out to use as counters with your kids. Or print out our handy Singapore model cut-out pictures and use them at home with your kids, to count people, ages, goals, coins or fruit.

Do basic arithmetic with objects

You can talk about most basic arithmetic using concrete objects, adding objects to the line, taking them away. 'Multiply' literally means 'many layers' and you can show times tables by layering rows one on top of the other.

Use interactive blocks

If you have an iPhone or Android mobile why not try BBC Skillswise's interactive blocks: text SKILLSWISE to 81010 or if you are reading this on your mobile device preview the interactive times tables blocks. Please note texts to the BBC cost 12-15p, interactive not compatible with all phones.

Draw pictures

Give kids pens and paper to draw things they count, lined up in a row. Encourage them to draw boxes around the pictures. The fact they have drawn the pictures gives them a sense of ownership and means they'll probably be more confident in talking about them.

Don't rush to use figures

Hold off from using number symbols until your child is really confident with concrete and pictorial representations and can make the link. So they will always have a ready way of picturing what the symbol means as a fall-back.

Start with figures 1 to 9

When you do start using symbols to label drawn boxes, stick to 1 to 9 at first to build confidence, so one figure relates to one quantity. The leap from the figure 9 to the figure 10 involves concepts of place value and zero which can take time to understand.

Brush up your own maths to help your kids

Most of us feel a bit rusty with maths, especially the new methods used in schools these days. Why not be a learning role model to your kids by joining a local maths class for adults? You can find out about free local courses from the National Careers Service as well as family learning centres near you on the Sure Start website. Or brush up your maths skills online with maths websites for adults like BBC Skillswise.

Go slowly to build confidence

It takes time for children to get really confident with the basics. The Singapore curriculum actually covers less than the UK national curriculum in the first few years, instead taking more time to build confidence

in the basics. But this pays off in spades later on.

TOP TIP: Be positive

Above all be positive. Enjoy playing with and counting objects together, celebrate effort and praise often. Real learning involves making lots of mistakes. Try to see mistakes as positive things that highlight deeper misunderstandings. Why did I think that? Kids have years of maths lessons ahead of them and every ounce of self-confidence helps them to succeed. Boosting children's understanding with objects and pictures is key.

## ADEA Tribute to Nelson Mandela



Nelson Mandela once said "Education is the most powerful weapon which you can use to change the world". Mandela regarded education as the tool for developing Africa and empowering individuals to lift themselves out of poverty. Today, we at ADEA feel a profound sense of loss of this greatest of statesmen of all times. Indeed, it is not only Africa that has lost, but the passing away of Madiba as he is fondly known in South Africa is felt throughout the rest of the world. We join World leaders and the rest of the international community and individuals around the world to pay our profound respects to this great man. Mandela was a lifelong educator and teacher. He taught us how to become better human beings for peace and justice. For him, education was a way to break down barriers and foster peace.

Not only did Mandela speak about the importance of education, but was a man of action as well when it came to education. For instance, in 2001, he suggested to African Union Heads of State at a summit that a network of African institutions of science and technology be established in order to address the knowledge deficit on the continent. This idea contributed to bringing into being the Nelson Mandela African Institution of Science and Technology in Arusha, Tanzania, as well as other science and

technology institutions in Nigeria and Burkina Faso. While in prison in Robben Island, Mandela taught his fellow inmates and even illiterate Afrikaaner guards to read.

As we remember Mandela' life and legacy, we should take this time to continue to make this world a better world for everyone, through intensifying our commitments and efforts to ensure that every African has access to quality education on all levels. With the current impressive growth rate on the continent with economies growing faster than those of almost any other region in the world, it is time that Africa build up a strong educated and skilled workforce that can translate this growth into prosperity for the African masses.

ADEA thanks Nelson Mandela for being such a great example to mankind and especially for his commitment to empower people all over the world through education.

## Bereavement in the Benin press: Didier Houndénou of L'Autre Quotidien has died 1979 – 2013



Death has once again struck the Benin press. The journalist, a specialist in education questions, Eric Didier Kokouvi Houndénou has passed away. He died in the early hours of the morning on Saturday, December 7, 2013. A journalist at the daily newspaper L'Autre Quotidien, Chief of the Education desk, he died from kidney failure. The disease led to his spending a few weeks at the Hubert Maga National University Hospital Center where death snatched him from the affection of his friends and family. An alumni of the Dantokpa Teaching College and the Abomey-Calavi University, he was, until the day he died, a member of the Network of Journalists Specialized in Education Questions and of the Club of Journalists for the Promotion of French Cooperation and French-Speaking Communities in Benin.

The minister of communication, the president of the Union of Media Professionals, the president of the Press Employers Association and other organizations of the press presented their condolences to L'Autre Quotidien.

A member of the ADEA-COMED WG network in Cotonou, he took part in several of the working group's activities in Cotonou and elsewhere.

Very distressed by the news, the COMED WG joins everyone to present its condolences to the bereaved family, to his friends and to the newspaper L'Autre Quotidien, which has just lost one of its finest writers.

Eric Didier Kokouvi Houndénou was born on May 24, 1979. He was 34 years old.

Rest in peace and may the earth lay gently over him!



## Journalist Komla Dumor, 1972 – 2014 (Extracted from the BBC World Service website)

BBC TV presenter Komla Dumor died suddenly on Saturday, January 18, 2014 at his home in London at the age of 41, after suffering a heart attack. The Ghana-born Dumor was a presenter for BBC World News and its Focus on Africa programme. One of Ghana's best-known journalists, he joined the BBC as a radio broadcaster in 2006 after a decade of journalism in Ghana. Ghanaian President John Dramani Mahama said on Twitter that his country had lost one of its finest ambassadors. BBC Global News Director Peter Horrocks called Dumor a leading light of African journalism who would be deeply missed. He was «committed to telling the story of Africa as it really is,» «Africa's energy and enthusiasm seemed to shine through every story Komla told». Mr Horrocks said in a statement. James Harding, BBC Director of News and Current Affairs, spoke of Komla Dumor's «singular role in transforming the coverage of Africa». «He brought a depth of understanding, a great deal of courage, a joyous charm and boundless charisma to his work,» Mr Harding said. In November, 2013, Komla Dumor was described by New Africa Magazine as "One of the emerging African faces of global broadcasting". He was featured in New African magazine's November 2013 list of 100 most influential Africans. It said he had «established himself as one of the emerging African faces of global broadcasting», who had «considerable influence on how the continent is covered».

Komla Dumor was born on 3 October 1972 in Accra, Ghana. He graduated with a BA in Sociology and Psychology from the University of Ghana, and a Masters in Public Administration from Harvard University. He won the Ghana Journalist of the Year award in 2003 and joined the BBC three years later. From then until 2009 he hosted Network Africa for BBC World Service radio, before joining The World Today programme.

In 2009 Komla Dumor became the first host of Africa Business Report on BBC World News. He continued to be a regular presenter of Focus on Africa and had fronted the programme the day before he died.

Dumor travelled across Africa, meeting the continent's top entrepreneurs and reporting on the latest business trends around the continent. He interviewed a number of high-profile guests including Bill Gates, Kofi Annan, and former US President Bill Clinton. In December, 2013 he covered the funeral of former South African President, Nelson Mandela, whom he described as «one of the greatest figures of modern history». He anchored live coverage of major events including the 2010 World Cup in South Africa, the funeral of Kim Jong-il, the release of Israeli soldier Gilad Shalit, the Norway shootings and the wedding of Prince William and Kate Middleton.

In his review of 2013, published last month, Dumor said the passing of Mandela was «one of the moments that will stay with me».

«Covering the funeral for me will always be a special moment. I will look back on it with a sense of sadness. But also with gratitude. I feel lucky to have been a witness to that part of the Mandela story.»

He leaves a wife and three children.

Upcoming events

Date	Type	Responsible	Title	Venue	Contact Person	Web Link/Source
February 17 – 20	ADEA	The Ministry of National Education and Literacy (MENA) of Burkina Faso and the ADEA Working Group on Non Formal Education (ADEA/WGNFE)	Meeting on the peer review in Burkina Faso	Ouagadougou, Burkina Faso	Ibrahima Bah-Lalya Tel: +226 7789-5498 <a href="mailto:lalyabah2@yahoo.com">lalyabah2@yahoo.com</a>	
February 17 – 21	Non ADEA	UNESCO – ICT in Education	Mobile Learning Week	Paris, France	Mark West Tel: +33 (0)1 45 68 09 04 <a href="mailto:m.west@unesco.org">m.west@unesco.org</a>	<a href="http://www.unesco.org/new/en/unesco/themes/icts/m4ed/unesco-mobile-learning-week-2014/">http://www.unesco.org/new/en/unesco/themes/icts/m4ed/unesco-mobile-learning-week-2014/</a>
February 18 – 21	Non ADEA	The Southeast Asian Ministers of Education Organization (SEAMEO)	The 36th SEAMEO High Officials Meeting (SEAMEO HOM)	Bangkok, Thailand	Chanika Nonthachai <a href="mailto:chanika@seameo.org">chanika@seameo.org</a> <a href="mailto:secretariat@seameo.org">secretariat@seameo.org</a>	<a href="http://www.seameo.org/">http://www.seameo.org/</a>
February 21	Non ADEA	UNESCO – All Programme Sectors	International Mother Language Day	Paris, France	Noro Andriamiseza <a href="mailto:n.andriamiseza@unesco.org">n.andriamiseza@unesco.org</a>	<a href="http://www.unesco.org/new/en/unesco/events/all-events/?tx_browser_pi1[showUid]=27237&amp;cHash=f9e6481ad2">http://www.unesco.org/new/en/unesco/events/all-events/?tx_browser_pi1[showUid]=27237&amp;cHash=f9e6481ad2</a>
February 27 – 28	Non ADEA	UNESCO	Rethinking Learning in a Changing World: 2nd meeting of Senior Experts	Paris, France	Sobhi Tawil Marie-France Desprin <a href="mailto:mf.desprin@unesco.org">mf.desprin@unesco.org</a>	<a href="http://www.unesco.org/new/en/unesco/events/all-events/?tx_browser_pi1[showUid]=28116&amp;cHash=10a135c4c8">http://www.unesco.org/new/en/unesco/events/all-events/?tx_browser_pi1[showUid]=28116&amp;cHash=10a135c4c8</a>

March 6 – 7	Non ADEA	UNESCO	Meeting of the EFA Steering Committee and the Task Force of the EFA Steering Committee for the Post-2015 Education Agenda	Paris, France	Margarete Sachs-Israel <a href="mailto:m.sachs-israel@unesco.org">m.sachs-israel@unesco.org</a>	<a href="http://www.unesco.org/new/en/unesco/events/all-events/?tx_browser_pi1[showUid]=27996&amp;cHash=ba43944793">http://www.unesco.org/new/en/unesco/events/all-events/?tx_browser_pi1[showUid]=27996&amp;cHash=ba43944793</a>
March 10 – 15	Non ADEA	Comparative and International Education Society (CIES)	58th Annual Conference of the Comparative and International Education Society (CIES)	Toronto, Canada	Karen Mundy <a href="mailto:CIESConference@gmail.com">CIESConference@gmail.com</a>	<a href="http://www.cies.us/2014/index.shtml">http://www.cies.us/2014/index.shtml</a>
March 17 – 18	ADEA	ADEA	Extraordinary Session of the ADEA Executive Committee and the Transformational Task Force	Sevres, France	Hamidou Boukary <a href="mailto:h.boukary@afdb.org">h.boukary@afdb.org</a>	<a href="http://www.adeanet.org">http://www.adeanet.org</a>
March 27 – 28	Non ADEA	UNESCO – French National Commission for UNESCO	Symposium: "Higher education and research: What do African societies expect today?"	Paris, France	Ms Paulina Gonzalez-Pose <a href="mailto:p.gonzalez-pose@unesco.org">p.gonzalez-pose@unesco.org</a>	<a href="http://www.unesco.org/new/en/unesco/events/all-events/?tx_browser_pi1[showUid]=27978&amp;cHash=ec5bf6a55f">http://www.unesco.org/new/en/unesco/events/all-events/?tx_browser_pi1[showUid]=27978&amp;cHash=ec5bf6a55f</a>
March 27 – 28	Non ADEA	The International Center for Pedagogical Studies (CIEP)	International conference: "Succeeding education in Africa: the challenge of languages"	Sevres, France	Jean-François Rochard Tél : +33 (0)1 45 07 60 94 <a href="mailto:rochard@ciep.fr">rochard@ciep.fr</a> Emmanuel Bailles <a href="mailto:bailles@ciep.fr">bailles@ciep.fr</a> Hamidou Boukary <a href="mailto:h.boukary@afdb.org">h.boukary@afdb.org</a>	<a href="http://www.ciep.fr/conferences/reussir-education-en-afrique-enjeu-des-langues/index.php">http://www.ciep.fr/conferences/reussir-education-en-afrique-enjeu-des-langues/index.php</a>

March 31 – April 1	ADEA	The Cote d'Ivoire Ministry of State and Ministry of Employment, Social Affairs, and Vocational Training in partnership with the ADEA Inter-Country Quality Node in the field of technical and vocational skills development (ICQN/TVSD)	Experts meeting for the development of policies and strategies, and identification of innovative and relevant skills to facilitate youth employment in Africa	Abidjan, Côte d'Ivoire	Amara Kamate <a href="mailto:amarakamate25@yahoo.fr">amarakamate25@yahoo.fr</a> Richard Walther <a href="mailto:walther.richard@orange.fr">walther.richard@orange.fr</a> Hamidou Boukary <a href="mailto:h.boukary@afdb.org">h.boukary@afdb.org</a> Raky Gassama Coly <a href="mailto:r.gassama@afdb.org">r.gassama@afdb.org</a>	<a href="http://www.adeanet.org">http://www.adeanet.org</a>
March 31 – April 1	Non ADEA	Worldview International Group, in partnership with the British Educational Suppliers Association (BESA) and supported by UK Trade and Investment (UKTI)	3 <sup>rd</sup> African Resources and Technology for Education (ARTE) Show 2014 Parallel event: Worldview's African Leaders in Education Forum	Abuja, Nigeria	Charlotte Mayanja Tel: +44(0)203 371 7903 <a href="mailto:charlotte.mayanja@worldview-group.com">charlotte.mayanja@worldview-group.com</a>	<a href="http://www.besa.org.uk/arte-show-nigeria-2014">http://www.besa.org.uk/arte-show-nigeria-2014</a>
April 15 – 20	Non ADEA	The International Center for Pedagogical Studies (CIEP) in partnership with the Pôle de Dakar of the UNESCO International Institute for Educational Planning (IIEP) and the private company of international consultants "Le Vif du Sujet" (LVDS)	Training session: "The Sectorial analysis and the planning for development of education"	Sevres, France	Michel Monsauret Tel : 33 (0)1 45 07 60 43 <a href="mailto:monsauret@ciep.fr">monsauret@ciep.fr</a>	<a href="http://www.ciep.fr/">www.ciep.fr</a> ( <a href="http://www.ciep.fr/lettre/2013/decembre/la-lettre-du-ciep-n-35.html">http://www.ciep.fr/lettre/2013/decembre/la-lettre-du-ciep-n-35.html</a> )
May 19 – 23	Non ADEA	African Development Bank (AfDB)	African Development Bank (AfDB) Annual Meetings	Kigali, Rwanda		<a href="http://www.afdb.org">http://www.afdb.org</a>
May 7 – 9 or May 14 – 16 (To Be Confirmed)	ADEA	ADEA	40 <sup>th</sup> session of the ADEA Steering Committee	Tunis, Tunisia	Aloise Prosper Faye Tel : +216 7110 3964 <a href="mailto:p.faye@afdb.org">p.faye@afdb.org</a>	<a href="http://www.adea.org">http://www.adea.org</a>

July 21 – 23	ADEA	The Cote d'Ivoire Ministry of State and Ministry of Employment, Social Affairs, and Vocational Training in partnership with the ADEA Inter-Country Quality Node in the field of technical and vocational skills development (ICQN/TVSD)	Ministerial Conference on Youth Employment	Abidjan, Côte d'Ivoire	Amara Kamate <a href="mailto:amarakamate25@yahoo.fr">amarakamate25@yahoo.fr</a> Richard Walther <a href="mailto:walther.richard@orange.fr">walther.richard@orange.fr</a> Hamidou Boukary <a href="mailto:h.boukary@afdb.org">h.boukary@afdb.org</a> Raky Gassama Coly <a href="mailto:r.gassama@afdb.org">r.gassama@afdb.org</a>	<a href="http://www.adeanet.org">http://www.adeanet.org</a>
September 8	Non ADEA	UNESCO	International Literacy Day	Paris, France	Venkata S. Ilapavuluri <a href="mailto:vs.ilapavuluri@unesco.org">vs.ilapavuluri@unesco.org</a>	<a href="http://www.unesco.org/new/en/unesco/events/all-events/?tx_browser_pi1[showUid]=27834&amp;cHash=5d3fb4ab50">http://www.unesco.org/new/en/unesco/events/all-events/?tx_browser_pi1[showUid]=27834&amp;cHash=5d3fb4ab50</a>
October 6 – 7	Non ADEA	UNESCO	World Teachers' Day	Paris, France	Lucio Sia <a href="mailto:wtd@unesco.org">wtd@unesco.org</a>	<a href="http://www.unesco.org/new/en/unesco/events/all-events/?tx_browser_pi1[showUid]=27837&amp;cHash=d4dff64f2">http://www.unesco.org/new/en/unesco/events/all-events/?tx_browser_pi1[showUid]=27837&amp;cHash=d4dff64f2</a>

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**Published by WG COMED  
Jan/Fev 2014**

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