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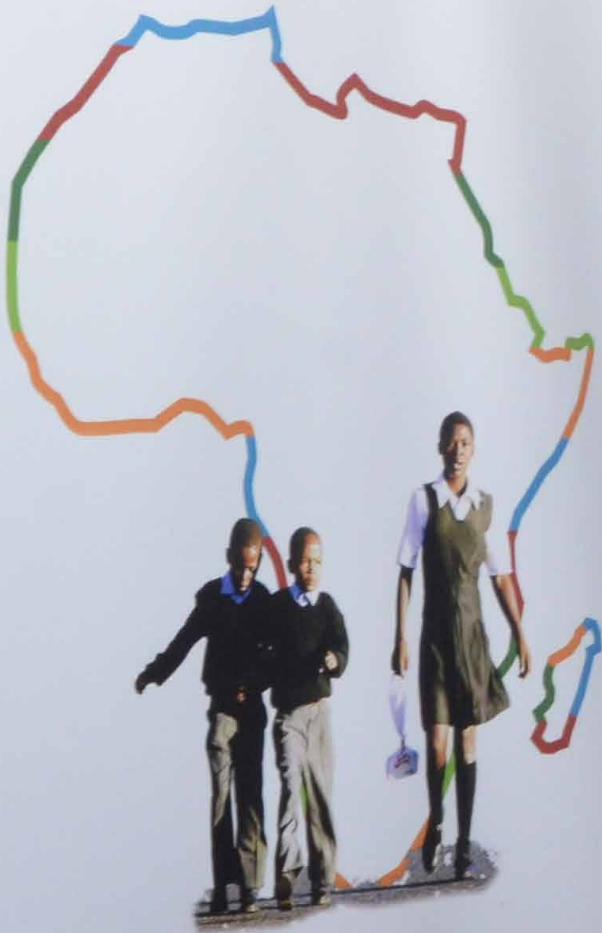
Dialogue on education for
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Africa
ICT in Education
Forum
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2nd African Ministerial Forum on ICT Integration in Education and Training

7, 8 and 9 June 2016

Heden Golf Hotel, Abidjan, Côte d'Ivoire



Ministry of
National
Education,
Côte d'Ivoire



Association for the
Development of
Education in
Africa

gesci
Founded by UN ICT Task Force



United Nations
Educational, Scientific and
Cultural Organization

ORGANISATION
INTERNATIONALE DE
la francophonie



Microsoft

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African Virtual University
Université Virtuelle Africaine
Universidade Virtual Africana

This document is a report of the 2nd African Ministerial Forum on ICT Integration in Education and Training. The Forum was held in Abidjan from 7th to 9th June 2016. This report was prepared by Claude LISHOU, the Forum's general rapporteur. Concept Note and program prepared by Tarek Chehidi.



Association for the
Development of
Education in
Africa



AGENDA

	Day before the Forum Tuesday 7 June	Day 1 Wednesday 8 June	Day 2 Thursday 9 June
Morning (09h00 – 12h30)		Session 1 – Panel of experts : <ul style="list-style-type: none"> ICT in national education and training policies and strategies – Lessons learned 	Session 4 – Panel of Experts : <ul style="list-style-type: none"> Application of ICT in teaching/learning of science, technology, engineering and mathematics (STEM) Launching of African Leaders’ Network for Sustainable Development
		Session 2 – Round Table of Experts : <ul style="list-style-type: none"> Empowering Marginalized Populations through ICT-based Educational Initiatives 	Session 5 – Ministerial Round Table : <ul style="list-style-type: none"> Incorporating ICT in Education, Shared Leadership and Policy Coherence
Lunch Break			Meeting of the 2017 ADEA Triennale Partners
Afternoon (14h30 – 18h30)	Meeting of the team of rapporteurs	<ul style="list-style-type: none"> Official Opening of the Forum Visit to the Innovation and Partnership Fairground 	Session 6 – Ministerial Round Table : <ul style="list-style-type: none"> ICT and Education in Areas and Regions Facing Crisis and Conflicts
	Meeting of facilitators	<ul style="list-style-type: none"> Round Table of co-organisers 	
	Meeting of GESCI’s partners	Session 3 – Ministerial Round Table: <ul style="list-style-type: none"> ICT and Development of Technical and Vocational Skills (DCTP) For Youth Employment and Entrepreneurship: Promising Models 	Session 7 – Ministerial Round Table : <ul style="list-style-type: none"> Inclusive Knowledge Societies and the Role of Education and ICT

Under the auspices of the Government of Côte d’Ivoire

Organisers : Ministry of Education of Côte d’Ivoire, ADEA, GESCI, AfDB, INTEL, UNESCO, OIF and Microsoft.

Guest of Honour : Republic of Senegal – Ministry of Higher Education and Research



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**2nd African Ministerial Forum on
ICT Integration in Education and Training**

7th - 9th June 2016 | Heden Golf Hotel, Abidjan

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ACRONYMS

AAU	Association of African Universities
ADEA	Association for the Development of Education in Africa
AfDB	African Development Bank
AUC	African Union Commission
AUF	French-speaking Universities Agency
AVU	African Virtual University
CLOM	Open and Massive Online Courses
CLOT	Universal Access Online Courses
GeSCI	Global e-Schools and Communities Initiative
GSM	Global System for Mobile Communications
IIEP	International Institute for Educational Planning
ICT	Information and Communication Technology
ICTE	Information and Communication Technology for Education
IFIC	French-speaking Institute for Knowledge and Distance Education Engineering
IICBA	International Institute of UNESCO for Capacity Building in Africa
INTEL	Integrated Electronics
MDGs	Millennium Development Goals
MOOC	Massive Open Online Course
MS	Microsoft
NREN	National Research and Education Networks
OER	Open Education Resources
OIF	International Organisation of the Francophonie
RELPE	Latin American Networks of Education Portals
SDGs	Sustainable Development Goals
SMS	Short Message Service
STEM	Science, Technology, Engineering and Mathematics
TELUQ	University of Quebec Distance Education
TVET	Technical and Vocational Education and Training
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USAID	United States Agency for International Development
WACREN	West and Central African Research and Education Network
WW	Education Worldwide Education



1. INTRODUCTION

The Government of Côte d'Ivoire, through the Ministry of Education, hosted the 2nd African Ministerial Forum on the theme of ICT Integration in Education and Training from June 7 to 9, 2016 in Abidjan. The Forum was jointly organized by the Association for the Development of Education in Africa (ADEA), the Global E-Schools and Communities Initiative (GESCI), the African Development Bank Group (AfDB), Intel, the United Nations Educational, Scientific and Cultural Organisation (UNESCO), the International Organization of the Francophonie (OIF) and Microsoft.

The Ministerial Forum established by ADEA, AfDB, UNESCO and their partners presented a regional political mechanism for dialogue. The purpose was to assist member states to capitalize on the possibilities of ICT to achieve national and continental goals for inclusive, quality and equitable education provision and lifelong learning for all.

The first ministerial Forum was inaugurated from December 9 to 11, 2013 in Tunis. The second Forum brought together policy makers, experts, academia, research institutes, development partners and ICT sector representatives from the private sector and civil society organizations by providing a platform for high-level regional dialogue and knowledge sharing on ways for effectively and efficiently integrating ICT in education and training systems in relation to :

- Providing universal access to quality education and relevant opportunities for lifelong learning to all Africans
- Equipping learners with skills to enable them to become full stakeholders in knowledge society development
- Promoting through education a digital literacy and creativity culture to enable Africa to strengthen its ICT industrial innovative capacities

The Forum also aimed at providing a framework for developing partnerships and projects which would attract the support of actors and stakeholders concerned with ICT integration as a means for transforming education provision. Two years have transpired since the first Forum. In that period, the Millennium Development Goals (MDGs) have been succeeded by several post 2015 agendas for development. The African Union Commission (AUC) has announced its vision for the continent (Agenda 2063) which was followed by the preparation of a strategy for Science, Technology and Innovation for Africa (STISA 2024), a continental strategy for Technical and Vocational Education and

Training (TVET) and a Continental Education Strategy for Africa (CESA 2016-2025). The latter has been adopted by the Assembly of Heads of State and Government at the African Union Summit held in January 2016, as the framework for the transformation of Africa's education and training systems. At an international level, the global community approved a new and ambitious development programme in September 2015, commonly referred to as the Sustainable Development Agenda 2030. All the above-mentioned development agendas highlight the key role of ICT as critical for the achievement of development goals in general, and in improving the quality, access and equity of education and training system provision in particular.

A recently published World Bank report entitled *World Development Report 2016 : Digital Divides* highlights development disparities underscored to a large extent by the function of technology: where digital divides are deepening between Africa and the rest of the world and within Africa itself (among generations, between rural areas and urban centres and between social groups). This is to say that notwithstanding a continental dynamic growth and enthusiasm for technology (with some 600 million mobile phone users – more in US or EU), a lot still remains to be done if Africa is to effectively use ICT to achieve education policy goals, and thereafter, social and economic development goals.

The World Bank digital divide analysis has particular application in education and training sectors saturated with ICT pilot and small project interventions. From among these, very few turn into large-scale national initiatives which can contribute to the attainment of educational goals and to the democratization of internet and technology access beyond educational circles. The variety of ICT education projects, designed and developed more often by development cooperation partners who fail to consult each another, coupled with the lack of large-scale national initiatives, contribute to the following limitations :

1. INTRODUCTION

- African governments and Ministries of Education and Training still require technical assistance to develop and implement ICT within the context of national education and training policies and strategies
- The main actors and stakeholders at national level continue to work in silos, which impede the emergence of the necessary infrastructures and ecosystems for effective and systemic ICT integration
- In the design of ICT integration programmes, too often the emphasis has been at national system deployment levels, with few initiatives engaging school and teacher level design and direction of ideas for integration
- There is a lack of coordination and alignment between ICT in education strategies and national development policies
- There is a deficit in models defining clear parameters for ICT integration in education and the way such models can be assessed and measured in order to inform effective planning and implementation
- There is a deficiency in ownership of ICT in education projects at central government and local levels

It is within this context and as a follow-up to the first Forum held in Tunis in 2013, that the government of Côte d'Ivoire, through its Ministry of National Education, hosted the 2nd African Ministerial Forum on ICT Integration in Education and Training on 8 and 9 June 2016 in Abidjan, where the Forum was co-organised by ADEA, Gesci, AfDB, Intel, UNESCO, OIF and Microsoft.



2. PARTICIPATION IN THE FORUM

The Forum brought together 155 participants from 37 countries made up of stakeholders representing education and ICT sectors (see participant list in the Annex). Apart from the co-organisers, the participants included :

- Ministers of Education, ICT, Higher Education and Scientific Research
- Policy makers and senior technical executives in the Ministries of Education, TVET, Higher Education and Scientific Research and ICT
- Education and training-related practitioners, skills and technology development experts (technical institutes, universities, research institutes)
- Participants from the public and private sectors in areas such as education, training and technology
- Regional and international experts involved in the development and implementation of education and training policies and in the integration of ICT in education and training systems (Development Cooperation Agencies, Regional Economic Communities)
- The African Diaspora which has distinguished itself in the area of integrating ICT into education and training
- International, regional and national media
- Civil society organizations (CSOs) and interest groups
- Youth organizations



3. FORUM PROCESS

3.1. INAUGURAL SESSION

- **Welcoming statements**

Mrs. Oley Dibba-Wadda, Executive Secretary, ADEA and Mr. Jerome Morrissey, Director General, GESCI

- **Official opening of the Forum by the Government of Côte d'Ivoire :**

His Excellency Mr. Robert Beugré Mambé, Governor of Abidjan, Côte d'Ivoire

His Excellency Mr. Bruno Nabagné Koné, Minister of Digital Economy and Posts, Government Spokesperson, Côte d'Ivoire

His Excellency Mrs. Kandia Kamissoko Camara, Minister of Education, Côte d'Ivoire

His Excellency Mr. Daniel Kablan Duncan, Prime Minister, Minister of Finance, Budget and Economy, Côte d'Ivoire

In their respective statements, Mrs. Oley Dibba-Wadda, Executive Secretary of ADEA, His Excellency Mr. Bruno Koné, Minister of Digital Economy and Posts, Her Excellency Mrs. Kandia Camara, Minister of Education of Côte d'Ivoire and Mr. John Galvin, Director in charge of Education at Intel Education, each affirmed their commitment and support for the integration of ICT in education and training in Africa.

In parallel with the opening ceremony, Her Excellency the Minister of Education, Mrs. Kandia Camara, on behalf of her Ministry, signed memoranda of understanding with Intel, Microsoft and GESCI.

In his speech, the Ivorian Prime Minister, His Excellency Mr. Daniel Kablan Duncan, commended the Association for the Development of Education in Africa (ADEA) for the technical support provided for the organization of the Forum dialogue and consultations on the issue of incorporating ICT into education in Africa.

On behalf of the President of the Republic, His Excellency Mr. Alassane Ouattara, the Ivorian Prime Minister welcomed the African Ministers, the experts and the various delegations that had come to participate in the Forum.

The Ivorian Prime Minister cited the WB (2016) report in his observation of the yawning digital divide between the African continent and the rest of the world. The Prime Minister commented that “there is the need to endow upcoming generations with the means to create value from ICT..., the means to make them part and parcel of the comity of nations”.

Finally, the Ivorian Prime Minister, His Excellency Mr. Daniel Kablan Duncan officially opened the second edition of African Ministerial Forum on the theme: **“Promoting Inclusive Knowledge Societies for the Implementation of Agenda 2063 for Africa and the SDGs”**.





Keynote Address

Mr. John Galvin, Vice-President in charge of Education, Intel

The power of ICT to transform education in Africa and achieve the SDGs, Mr Thierry N'Doufou, CEO, Qelasy

Transformation Today to Achieve the Goals of Tomorrow, Mr. Warren La Fleur, Officer in charge of Education, Central, West and East Africa, Microsoft



This was followed by a closed session of a round table of co-organisers

Facilitator: Mrs. Oley Dibba-Wadda, Executive Secretary of ADEA

- Mr. Jerome Morrissey, Director General, GESCI
- Mr. John Galvin, Vice-Chair of Education, Intel
- Dr. David Atchoarena, Director of Policy and Lifelong Learning Systems, UNESCO Headquarters
- Dr. Sunita Pitamber, Director of the Department of OSHD, AfDB
- Mr. Simon Ouattara, Director General, Microsoft West and Central Africa



3.2. THEMATIC SESSIONS

In alignment with the guidelines and goals set by the organisers, the Forum was conducted in seven thematic sessions where each was organized in presentation and discussion formats. The focus was to generate ideas and concrete approaches for opening pathways towards transformative shift in education and training systems in Africa with appropriate and effective integration of ICT.

The session themes were designed to explore a systems perspective of ICT integration in education and training related to :

- policy and strategy for ICT deployment that is inclusive and empowering
- technology use to support critical skills development in STEM and TVET
- leadership roles and policy coherence
- technology integration that is responsive to the multi-faceted demands of national and regional transformation development agendas towards inclusive knowledge societies

Session 1

Type of session	Panel of experts
Theme	ICT in National Education and Training Policies – Lessons learned
Relevance	The session highlighted African government recognition of the importance of ICT use to improve educational access and quality. However regional reports and forums indicated low ICT application in relation to teaching and learning (the African Development Bank Group and the World Bank Group, eTransformAfrica: ICT for Education in Africa). For the most part, the use of ICT in education and training is focused on administering and managing systems

Seven presentations were made followed by discussion:

Côte d'Ivoire's ICT strategy in the area of education	Mr. Aboubacar Coulibaly, Director of Information and Communication Technology at the Ministry of Education, Côte d'Ivoire
Initiative 1-1 of Kenya	Mr. John Temba, Head of ICT Department for Education, Ministry of Education, Kenya
Niger's ICT Project - Highlighting Policy and Strategy: Cost Sharing	Dr. Erwan Le Quentrec, Department of Sociology and Economics on Usages of Orange Labs (SENSE)
PPP for the Implementation of ICT Policies and Strategies in Education	Mr. Moïse Kouakou, Marketing, Sales and Business Development Officer, Qelasy
Digital Technology and Education in a Transformed Country: The Case of Portugal	Mr. João Pedro Lopes, Director of Institutional Affairs, JP Sa Couto



National Research and Education Networks (NRENS) and their key role in ICT at the national level concerning education policies in Africa

Mrs. Nodumo Dhlamini, Director of ICT Services and Knowledge Management, Association of African Universities (AAU)

Training my Generation- Gabon 5000

Mr. Laurent Ndaywel Mbosele, Project Manager, UNESCO

Dr. Mpine Makoe, Director of the Institute for Open and Distance Learning of the University of South Africa (UNISA), moderated the session and highlighted the critical role of policies in providing a clear vision, guideline and roadmap for economic development and sustainable goals. Dr. Mpine described two types of policies: strategic policies (vision as to where we are going and what we hope to achieve by 2030) and operational policies (how to get there). After the presentation and plenary sessions, the moderator summarized the challenges, the success factors and key recommendations which emerged from the session on ICT policy and strategy in education.

Challenges

- Most countries have ICT policies and some have strategies that enable them to use ICT in an integrated manner
 - However, there is lack of awareness raising and policy ownership between the various levels of education systems in relation to: national institutional vision and implementation (macro level), dissemination to partners and institutional providers of teacher education, training programmes and content development (meso level), school vision and implementation (micro level)
 - Infrastructural challenges in national network energy and connectivity coverage inhibiting equitable access to technological solutions
 - Technology integration creating new cognitive, digital, and information divides as a result of access constraints
 - Lack of ICT skills in education and governance systems from national to classroom levels in relation to: essential leadership skills for technology use to strengthen management and information systems in respect of ICT data management; teachers' skills for the pedagogical integration of ICT; student ICT skills to access and use information, to solve problems and to innovate products and processes that will help them to adapt, participate in and contribute to knowledge-based economies
-

Success factors

- ICT Master Plan and Strategy: Developed on the basis of multi-level consultation of stakeholders and partners; coherence across ministerial policies - finance, energy, education (formal and informal, vocational training, youth), research, science, technology and innovation and ICT; clear guidelines, indicators and timelines for impact monitoring and evaluation
- Technology: Integrated end-to-end system models covering technical assistance, e-content development, connectivity solutions, mobile options, contextualized responsive systems adequate to the needs of schools and communities
- Curriculum: Emphasis on e-content, reformed curricula and pedagogical strategies; integration of ICT as a specialist subject area; development of ICT skills for strengthening innovative practice, the quality of teaching and learning and preparing young people with higher order skills to contribute to new knowledge economies
- New employment opportunities in the computer industry: digital books, digital editors, smartphone revolution - with derived employment opportunities related to maintenance (devices and peripherals, school systems)
- Professional Development : Teacher development models for ICT integration from pre-service to in-service
- Cost sharing : Based on new models of public-private partnership. The Portugal Magellan Initiative illustrates a sustainable distributed costs model involving a triad of Government, beneficiaries and telecommunications operator contributions. The model shows sustainable upscaling potential which does not depend exclusively on Government intervention with :
 - Distribution of the model ownership to communities/families
 - Support of beneficiary capacities to contribute with possibilities for credit through micro-finance systems
- Integration of regional policies: Infrastructure development (re-organization of current structures), connectivity (negotiation of reasonable costs for national education and research networks with national and regional service providers – that places emphasis on provision of services and re-investment)



Recommendations on ICT policies in education

- Provide a clear vision, guidelines and roadmap for economic and sustainable development goals
- Develop strategies defining both visions for ICT integration and operational components for implementation in education planning and action from national to school level
- Integrate robust elements for monitoring and evaluation to measure impact of ICT interventions in the education sector and their potential to speed up inclusive access at all system levels (from pre-school, to primary, secondary, higher education, TVET and in the formal and informal context)
- Harmonize capacities through learning from pilot and national/ regional deployments
- Focus on what is doable and what are the available resources trialled and validated in pilot models
- Ensure that specific contextualized needs are addressed and models are disseminated for access across the entire educational system
- Negotiate models for sustainable interventions - which draw on shared contributions by beneficiary communities and public-private partnerships
- Put an emphasis on policy for building teacher ICT competences as well as student ICT skills







Session 2

Type of session	Panel of Experts
Theme	Empowering marginalized populations through ICT-based educational initiatives
Relevance	<p>The SDG No. 4 urges governments and the international community to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”. The CESA 2016-2025, an African framework for transforming education and training related to the global goal for quality education provision is underpinned by six principles among which is the realization that “global, inclusive quality education providing good conditions for continuous education is a prerequisite for sustainable development”. These commitments towards inclusive education are not simply the result of an education approach based on human rights, but also motivated by the fact that the countries would not be able to attain sustainable development and prosperity while marginalizing groups that can contribute to their socio-economic development. Countries must harness the totality of their potential to achieve inclusive growth and sustainable development on the basis of innovative teaching models and the appropriate use of technology. The attainment of this very ambitious endeavour can be realized by “reaching out to the marginalized”</p>

Eight presentations were made, followed by discussions :

Initiative of CUA Africa + Education	Mr. François Baudry, General Manager, People TV
A favorable environment for the use of accessible technology to ensure inclusive education and information access in Uganda:	Mr. Jacob du Toit, Communication & Information Adviser, UNESCO Regional Office for East Africa
Integration of ICT at the National Institute of Education and Training of Young Blind People in Senegal	Mrs. N’Gossé Fall, Inspector of Secondary Education, Ministry of Education
Support Project for Education by using Solar-powered Internet at Schoo	Mr. Min Kim, Principal Researcher at the KERIS Centre for Policy Research and International Cooperation, KERIS, Republic of Korea
ICT for Literacy of Marginalized Groups	Mr. Gabriel Cohn Bendit, Vice-President, REPTA
Use of ICT for Literacy and Digital Technology in areas affected by conflicts	Mrs. Sana Ghenima, General Manager, SANABIL MED
Empowering Marginalized Groups Through ICT: The Case of Senegal	Dr. Toumani Doumbouya, Coordinator, RCE, Senegal
The Global Book Fund and Technology Integration	Anthony Bloome, Sr. Education Technology Specialist, USAID

After the presentations and plenary discussions, the facilitator, Professor Hamadou Saliah-Hassane of TÉLUQ provided a summary of the challenges, success factors and key recommendations which emerged from the session on empowering marginalized populations through ICT-based educational initiatives.

Challenges

- How to use ICT for marginalized populations/people with disabilities
- Integrating an inclusive approach to information access for people with disabilities
- How to develop adapted digital spaces training
- Improving ICT Education Policies for Inclusive provision
- Developing ICT Infrastructure, in particular Internet Access
- Developing Learning Tools in Local Languages
- Moving from the Pilot Project Phase to Upscaling and Re-using Existing Devices
- Thinking About Mobile Classroom Concepts
- Challenges faced in Maintaining ICT Equipment
- Collaboration with Research Centres to find adaptive solutions for the needs of marginalized populations/people with disabilities

Success factors

- Harnessing opportunities to use solar energy in rural areas
- Geographical accessibility of ICT Infrastructure
- Adaptation of ICT tools and content in the local languages
- Governance of projects by establishing steering and monitoring committees
- Availability of an efficient and inclusive ecosystem: starting from policy, organizing the system, infrastructure and human resources
- Involvement of marginalized populations in defining user needs as a means of creating a conducive environment for inclusive use of technology

Recommendations

- Viewing the issues of equity in the area of ICT: accessibility and availability of suitable learning equipment and content, especially for marginalized populations
- Scaling-up pilot projects with the aim of institutionalizing them
- Re-thinking the maintenance and re-use of ICT equipment
- Creating an efficient and inclusive ecosystem
- Promoting partnership with the private sector for the establishment of suitable project procedures





Session 3

Type of session

Ministerial Round Table

Theme

ICT and Development of Technical and Vocational Skills Development (TVSD) for Youth Employment and Entrepreneurship: Promising Models

Relevance

According to the background note of the African Development Bank Group on demographic developments in Africa, the African population aged between 15 and 39 years will reach 637 million by 2030. The harnessing of this rapid increase in the youth population to promote growth on the continent or as a source of instability will depend, among others, on the relevant learning opportunities provided by African education systems to the youth. Africa cannot afford not to derive benefits from its demographic strength since government experts and development partners must propose innovative models to equip the African youth with skills for employment and entrepreneurship. The CESA 2016-2025 calls for the development and implementation of innovative strategies to broaden TVET opportunities both at secondary and tertiary levels and strengthen the linkages between the labour market and the education and training systems.

- His Excellency Mr. Daouada Mamadou Marthe, Minister of Primary Education, Literacy, Promotion of National Languages and Civic Education, Niger
- His Excellency Prof. Mary Teuw Niane, Minister of Higher Education and Research, Senegal
- His Excellency Mr. Abdoulaye Yero Baldé, Minister of Higher Education and Scientific Research, Guinea
- His Excellency Prof. Narciso Damásio dos Santos Benedito, Secretary of State for Education, Angola
- Mr. Jerome Morrissey, Director General, GESCI
- Mr. David Maccaron, Director of Education EMEA, Intel

The facilitator, Mrs. Satu Jarvinen, Director of Educational Services engaged the panel with some relevant comments and questions. She described the problems concerning the upsurge of youth unemployment and development of the needed related skills. She explained how in Finland, 50% of the youth go into TVET. Mrs. Satu put three questions on the table for discussion, namely: At what stage do we find ourselves in terms of challenges? Are we too confident with the power of ICT? What are we doing to find new innovative solutions in the area of integrating ICT?



Challenges

- Youth unemployment is a global challenge
- The rate of youth unemployment is very high in Africa
- People are engaged in the ICT sector and informal learning

Learning

- The existing structures have not been able to provide progressive solutions to meet the needs of developing skills to tackle the issue
- Good models have already been developed and the countries want to share best practices
- However, new innovative approaches that completely use digital technology (e.g. automation) should be developed

Recommendations

- Additional political will to undertake reforms that promote ICT
- ICT Integration models in educational systems should allow for more efficiency and equity and guarantee access without setting aside the quality factor. The models and experiences of Kenya and Portugal serve as examples
- The most important factor now is to examine integrating ICT and financing opportunities with the support of key institutions such as the African Development Bank Group
- Supporting teacher educators to integrate ICT into training
- Establishing mechanisms for the registration of more girls into the ICT industry and providing positive models to attract and retain girls in the sector and engage them in practical experiences
- Necessity to develop or adapt the frameworks for skills development and capacity building of 21st century learners outside the schools
- Recruit and train more ICT teachers?



Session 4

Type of session	Panel of Experts
Theme	Application of ICT in teaching/learning of science, technology, engineering and mathematics (STEM)
Relevance	Promotion of teaching/learning of STEM is a key factor for the future of Africa's social development and economic growth. The continent needs STEM skills to think and drive its growth, by incorporating the gender dimension. "If Africans hope to solve the problems and move ahead in their social and economic development in their own countries – instead of leaving them in the hands of international humanitarian organizations – all African learners would need to acquire high level STEM skills" (World Economic Forum -WEF, 2015). African Union's STISA-2024 places science, technology and innovation at the centre of development and socio-economic growth in Africa.

Seven presentations were made followed by discussions:

African digital schools' Initiative: STEM, ICT and the Teaching Profession	Mrs. Mary Hooker, Principal Education Specialist , GESCI
ICT and Open and Distance Learning (AOD) for capacity building of teachers in STEM in Africa	Dr. Temechegn Engida, Programme Officer, UNESCO-IICBA
ICT Applications and STEM Secondary Education in Mauritius	Mr. Ricaud Auckbur, Director of Tertiary Education & E-Education, Ministry of Education and Human Resources, Tertiary Education and Scientific Research, Mauritius
ICT and Girls in STEM Education	Mrs. Martha Muhwezi, Principal Programme Coordination Officer, FAWE
ICT and STEM in Secondary Education in Morocco	Mr. Aziz El Hajir, Ministry of Education, Morocco
Enhanced Access to Resources under STEM: The Experience of the African Virtual University	Dr. Bakary Diallo, President, African Virtual University
Technological Education in Côte d'Ivoire: Situational Analysis	Dr. Koné Tiemoman, Director of Information and Technology Science, Ministry of Higher Education and Research, Côte d'Ivoire

After the presentations and plenary discussions, the facilitator, Dr. Alexa Joyce, International Director of Public Sector Educational Enterprises Development at Microsoft provided a summary of challenges, success factors and key recommendations which emerged from the session on ICT applications in teaching/learning of STEM.

Challenges

- ICT to achieve the goals of STEM learning
- STEM equity in terms of skills and performance
- How to build capacity
- How Africa could follow the technological evolution
- Taking the gender dimension into consideration: ensuring that girls get involved in STEM
- Access to the content for distance training
- How to solve the problem of mass enrolment

Success factors

- Change in paradigm
- Teacher Training
- Development of Distance Education
- Project Management, Planning and Evaluation
- Partnership
- Awareness raising and encouragement among girls
- Conducive environment
- Need for institutionalization through specific budgetary allocation
- Establishment of appropriate infrastructure

Recommendations

- Support for teachers
 - Integrating ICT from the beginning of the career path
 - Inclusion of Gender Dimension in the Thematic Area
 - Need to have a paradigm shift in the promotion of STEM
 - STEM Development Policy
 - Organisation of Competitions to get Girls Involved in STEM
 - Awareness raising among partners on the Gender Issue
 - Integration of ICT in the curricula
 - Importance of Cooperation with the Ministries to harmonize training policies
 - Improving the digital environment and developing distance practical work
-



Session 5

Type of session Ministerial Round Table

Theme **Integration of ICT, shared leadership and policy coherence**

Relevance The existence of such a large number of pilot programmes and a very limited number of ICT-based large-scale initiatives in the education and training systems in Africa can be explained by: a) the lack of linkage between ICT in educational policy with other policy sectors (i.e. STI and ICT); b) the lack of alignment in national social and economic development policies, thus making it difficult to mobilize the entire government and the stakeholders as well as the necessary resources; and c) the lack of the necessary shared leadership for step by step linkage with the visions and ambitions to the top and bottom, and also analysis of the real issues and finding of actual solutions which will translate the ambitions into achievable policies/strategies and effective programmes.

- His Excellency Mr. Bruno Nabagné Koné, Minister of Digital Economy and Posts, Côte d'Ivoire
- His Excellency Mr. Paul Koffi Koffi, Minister of Technical Education and Vocational Training, Côte d'Ivoire
- His Excellency Mr. Jean Martin Coulibaly, Minister of Education and Literacy, Burkina Faso
- Dr. Michael Chilala, Director General, Examinations Council, Zambia
- Dr. Fencheng Miao, Officer in charge of ICT Education, UNESCO
- Dr. Alexa Joyce, International Director of Public Sector Education Development Enterprises, Microsoft
- Mr. Thierry N'doufou, Director General, Quelasy

After the presentations and plenary discussions, the facilitator Dr. Patti Swarts, Director of Programmes, GESCI gave a summary of the challenges, success factors and key recommendations which emerged from the session on integration of ICT in education, shared leadership and policy coherence.

Challenges

- Providing adequate financial resources
- Solving the issue of access to technology
- Establishing coherence in ICT integration
- Ensuring shared leadership together with policy coherence

Success factors

- Establish a national framework to drive actions
- Have in place a sectoral and comprehensive approach
- Ensure capacity building at all levels
- Ensure regular monitoring/evaluation



**Recommendations**

- Ensure the involvement of all stakeholders and adopt a cross-cutting sectoral approach
- Strengthen management capacity of administrative setups and teachers
- Ensure coordination of efforts by all possible actions
- Put in place all incentive mechanisms to improve educational contents
- Promote the establishment of sustainable and long-term projects and scaling up
- Put in place a strong policy framework which guides actions to be taken

Session 6**Type of session** Ministerial Round Table**Theme** **ICT and education in areas and regions affected by crises and conflicts****Relevance**

Education is recognized as a universal right for all, an essential element of economic and social development of nations. Conflicts and crises hamper progress towards achieving the SDGs education. In areas and regions affected by crises and conflicts, the effects on the education system undermine the achievement of these goals. How to mitigate the impact of crises and identify the ways and means of ensuring access to education for children and young people in crisis situations, as part of the 2030 Education Agenda. While highlighting the main challenges and lessons learnt, discussions and proposals should guarantee access to safe and quality education for every child living in a crisis situation. How to harness the potential of ICT in regions or areas affected by crises and conflicts to achieve the goals of an inclusive, quality and equitable education.

- Her Excellency Mrs. Nialé Kaba, Minister for Planning and Development, Côte d'Ivoire
- Her Excellency Prof. Ramata Ly-Bakayoko, Minister of Higher Education and Scientific Research, Côte d'Ivoire
- His Excellency Mr. Mallam Adamu ADAMU, Minister of Education, Nigeria
- His Excellency Dr. Saku Dukuly, Deputy Minister of Science, Technology, Vocational and Specialized Education, Liberia
- Her Excellency Mrs. Ester Anna – Liisa Shiwoom wenyo Nghipondoka, Deputy Minister of Education, Arts and Culture, Namibia
- Dr. Mario Franco, President, Fondation Millennium@EDU
- Dr. Mona Laroussi, Managing Director, IFIC - AUF

After plenary presentations and discussions, Mr. Mohamed Touré, Resident Representative, UNHCR Abidjan summarized the key challenges, success factors and recommendations that emerged from this session on ICT and education in areas and regions beset with crises and conflicts.

Challenges

- Management and access to education during crisis
- How to get the best out of ICT to provide education during crisis
- Role of Governments in maintaining education during conflicts
- How to deal with the rehabilitation and reconstruction of Infrastructure during crisis
- Addressing electricity and connectivity challenges in conflict areas
- Provision of training programmes for refugees
- How to ensure the continuity of teaching in the event of strikes
- Quality of training in conflict-stricken areas

Success factors

- Provision of ICT infrastructure
- Distance education
- Promoting peace through ICT
- Restoring education through ICT
- Continuing education
- Availability and access to energy

Recommendations

- Consider education as a universal right even in the event of a conflict
- Strengthen partnership with humanitarian agencies
- Improve connectivity and availability of energy sources
- Adopt specific measures for refugees
- Reallocate resources to ensure more fairness
- Prioritize countries facing conflicts
- Establish specific infrastructure for access in areas affected by conflicts





Session 7

Type of session Ministerial Round Table

Theme **Inclusive knowledge-based societies and the role of education and ICT**

Relevance The building of inclusive knowledge-based societies in Africa paves the way for growth and the achievement of sustainable development goals. It is common knowledge that the process of building a knowledge society is based on two (2) pillars (i.e. education and STI) and a catalyst factor (ICT). It is therefore essential that leaders, policy-makers and public administrators have a critical understanding of the concept of knowledge society. The concept should basically depend on the relevance and efficiency of the impact of education policies and how ICT is used to eventually achieve sustainable development and promote development and expression of cultural and linguistic diversity for all.

- Her Excellency Mrs. Kandia Kamissoko Camara, Minister of Education, Côte d'Ivoire
- His Excellency Mr. Sidi Tiémoko Touré, Minister for Youth Development, Youth Employment and Civic Service, Côte d'Ivoire
- Her Excellency Prof. Mary Teuw Niane, Minister for Higher Education and Scientific Research, Senegal
- Mr. Lacina Koné, Presidential Adviser on ICT Affairs
- Mrs. Ann Thérèse Ndong-Jatta, Director of UNESCO's Regional Office for Education in Africa
- Mr. Warren La Fleur, Education Lead for West, East & Central Africa, Microsoft
- Mr. Mamadou Ndoye, former Minister of Education, Senegal
- Dr. Mario Franco, President, Millennium@EDU Foundation

Challenges

- Advent of inclusive quality education
- Administrative management driven by ICT
- Training of primary school teachers
- Development of ICT contents
- Development of knowledge-based society and economy
- Addressing obsolescence and renewal of ICT equipment
- Success of basic education
- Adapting training to employment
- Support for teachers in rural areas

Success Factors

- Creation of digital classrooms
- Distance education for basic school teachers
- Training in ICT
- Access to ICT for all, especially for pupils and teachers
- The existence of platforms linking companies and job seekers

Recommendations

- Make education free and compulsory
- Promote an inclusive access to information
- Introduce ICT in training and make it a teaching subject
- Use ICT to govern the system and manage staff
- Develop community roots via an Open Digital Space
- Put in place the reforms required for new generations
- Implement the three pillars (Education/STI/Leadership) of the knowledge-based societies
- Invest in research to identify training needs
- Engage all stakeholders in achieving knowledge-based societies





4. ICT AND EDUCATION: STRATEGIC ANALYSIS OF PRACTICES RELEVANT TO THE TRANSFORMATION AND SUSTAINABLE DEVELOPMENT IN AFRICA

From the three-day fruitful presentations and discussions, the following analysis attempts to identify key insights on contextual data and development issues, policy guidelines for action, lessons learnt from experiences, perspectives, messages and recommendations.

The integration of ICT in education can transform Africa within the framework accepted by all for Sustainable Development Goal 4, to be extended to related SDGs 5, 7, 8 and 9. But, one must first seek to understand the reasons for mixed achievement of MDGs in order to adjust the implementation and achievement strategy of SDG 4.

The resultant goal could therefore be referred to in the following terms :

Reducing or eliminating poverty, providing everyone the opportunity to be in good health and a guaranteed well-being, providing everyone the opportunity to access quality education and lifelong learning without any discrimination whatsoever while respecting environmental standards and allowing everyone to have a decent job to support growth on the continent.

The presentations and discussions throughout the Forum revealed an urgent need to improve and transform education systems and training in Africa through relevant and effective integration of ICT. The essential requirement was to build a real understanding of the impact of the technological tool in transforming education with a view to going beyond previous programmes, inadequate reforms and a sense of tinkering with educational change.

In his speech, Mr. John Galvin, vice-president of INTEL, spoke about the potential of technology integration in education for human capacity building to adapt and prepare for the future. In future, 8 jobs out of 10 will require technical skills and training for employment opportunities that are yet to see the light of the day. The most important requirements for students, quite apart from getting access to technology, are design skills to be able to take ideas and put them into practice.

Mr. Thierry N'Doufou, CEO Qelasy describes a continent in full transformation with and through the use of technology, which impacts more than 200.000 million dynamic young people between 15 and 24 years. Growth trends in telephony and connectivity are the highest in the world, exporting mobile innovation models in the world, giving hope to this continent which is digitally open and ready for development challenges through the intermediary of education.

Mr. Warren La Fleur of Microsoft highlights the difficulties in the private sector to find adequate human resources in science, technology, engineering and mathematics. As a matter of fact, these difficulties reflect the poor performance and poor educational system results of the continent from basic to higher education.

These are the drivers for the argument of successful industry practices transfer in the digitization of the education sector. Educational transformation goes beyond technology. To achieve an ambitious common vision, the whole system must be changed throughout the territories with regional visions and strategies and prioritization of actions.

Achieving sustainable development is really possible only through inter-sectoral efforts

In view of the key role it plays, education should take into account the interdependence of Ministries responsible for ICT, Higher Education and Scientific Research, Energy and Employment, Technical and Vocational Education, digital economy, national entrepreneurship, craft industry and SMEs and youth development, civic service and youth employment, and help to bring about the change of mentality needed to trigger actions for sustainable development.

Sustainable development will not only be the fruit of technological solutions, policy regulations or financial instruments. Recognizing their important role, SDGs are not solely confined to education and pursuing an independent goal, but they also include targets related to education in other SDGs, such as health, growth and employment, consumption and sustainable production and climate change. To get there, we should examine the cross-cutting linkages between education and other issues related to sustainable development, while emphasizing the transformative power of education and showing the importance of inter-sectoral approaches.

Public and Private Partnership (PPP): Investment in Education

Companies should develop partnerships with civil society organizations, governments and among them to create new solutions to improve learning and data collection for education; help align school curricula with the requirements in the job market; develop technologies for teaching, including technologies for the most marginalized groups; and participate in multi-stakeholder platforms.

Africa, a continent in full economic and demographic growth increasingly connected and digitally opened up

Africa is made up of 54 countries and inhabited by more than 1 billion people and it is characterized by uninterrupted economic growth of more than 5% over the next 10 years, and by more than 200 living languages, by over 200 million people aged between 15 and 24 years.

Many initiatives (e.g. WACREN, Ubuntu ...) are underway to bridge the gap and interconnect the major cities including the hinterlands.

Autonomous and robust mobile digital classrooms

Access to education should be possible everywhere, via mobile classes, self-sufficient in energy, less dependent on telecommunication networks, offering an All-in-One education (digital resources for the teacher, lesson delivery platforms, homework management platform and other tests, digital mobile laboratories for science education, language laboratories, mobile digital libraries). The digital educational content, designed for African schools, must be embedded in tablets which are resistant to adverse weather conditions (rain, dust, heat).

Different ways of using technologies but still not fully used in education

Today, technology is all over Africa and it is used in many areas to improve living conditions. However, technology is mainly used in Africa for communicate, information and entertainment, but it is not yet sufficiently developed for self-training.

5. CLOSING SESSION

The Managing Director of GESCI, Mr. Jérôme MORRISSEY underscored “the crucial importance of education and skills development for social cohesion, employment and more generally for the development of knowledge-based societies”. He also added that “countries should give priority to improving their education models, through integration of digital technologies”. He recalled that such an orientation must compete with Sustainable Development Goal (SDG) No. 4 which is to “ensure an inclusive and equitable education and promote lifelong learning opportunities.”



The Executive Secretary of ADEA, Mrs. Oley DIBBAWADDA stated that “the integration of ICT in education is a technical and political issue that will ensure continuing education for both teachers and learners.”



After the Forum, the Minister of Education of Côte d'Ivoire, His Excellency Mrs. Kandia Kamissoko CAMARA, delivered the official closing remarks. She said in particular that: “the Forum showed that Africa has committed itself wholeheartedly to digital technologies. Our countries are aspiring to become emerging countries; they will succeed with a key element, which is quality education that includes ICT.”



6. RECOMMENDATIONS

All the recommendations that emerged from the Forum aim at improving ICT integration in education and developing 21st century skills required for Africa's development. Participants are convinced of the power of ICT to transform education in Africa and achieve the SDGs. They call on governments and stakeholders in education and training to consider the following recommendations :

POLCY RECOMMENDATIONS

To engage in shared national and regional policies and actions of transformation programmes on the continent

Move from policy formulation to action by developing regional and national programmes and strategies as well as accountability mechanisms consistent with Africa's 2063 Agenda and the 2030 Global Agenda.

Strengthen public and private partnerships to accelerate the operationalization of political decisions

Create an enabling environment for partnerships essential to the relevance and sustainability of ICT integration in the development and accelerated implementation of education and training policies and strategies creating synergies among all stakeholders who play a role in building a digital education-based knowledge society.

PRACTICAL RECOMMENDATIONS

Consider ICT as a lever for change in formal, informal and non-formal education

- Integrate digital technology in all vocational and technical skills development programmes
- Accelerate the use of ICT to offer each student an equal opportunity to access quality education
- Design and deliver training courses tailored to the needs of children and young people beset with crises and conflicts and other marginalized groups
- Create multi-functional digital access spaces and make them available to all the driving forces in the country (pupils, students, youth, women and economic actors) to support education, health and a favourable business environment

Develop learner design and problem solving capabilities to fit into the 21st century job market

- Promote the employment and self-employment of the youth through holistic training combining mastery of the latest technologies, support by professionals and an incubation period for the creation of start-up businesses with logistical and financial support
- Put in place sustainable financing strategies through partnership development with foundations, technical and financial partners, telecommunications operators and regulators and various digital solidarity funds

Adapt regional and national qualification frameworks to diversified accreditations and certifications

- Establish mechanisms for credential recognition and technical and vocational skills certifications outside formal settings so as to promote access to employment as well as youth employability and mobility
- Encourage the creation of training contents drawing on indigenous cultures through provision of incentives

Engage in multi-sectoral, multi-partner, multi-systems networking to achieve priority strategic actions

- Establish technological alliances to provide the African continent with the latest equipment and operating systems
- Ensure energy supply in schools by setting up mini-networks and systems where there is no conventional energy supply networks
- Create awareness about the importance of economic benefit that the private sector could derive and especially young economic operators to invest in computer equipment assembling companies (e.g. computers, tablets, ...) or energy companies (e.g. solar panels, batteries, inverters, ...) required for the integration of ICT in education.



7. CONCLUSION

It is difficult, if not impossible to think about the context of this report concerning the rich ideas which have been developed during the three-day Forum's discussions.

Having been a platform for the sharing of knowledge and experiences, the Forum provided the space for discussions on how to integrate ICT in education as a way of improving quality and the services, and to equip learners with 21st century skills that would enable them to become full-fledged actors of knowledge societies and to be part and parcel of its economy.

The panels of experts and the ministerial round tables reflected on the following themes :

- ICT and development of technical and vocational skills for youth employment and entrepreneurship
- ICT in national educational and training policies and strategies
- Empowerment of marginalized populations through ICT education-based initiatives
- ICT in education and learning of science, technology, engineering and mathematics
- ICT in education, shared leadership and policy coherence
- ICT and Education in areas and regions affected by crisis and conflicts
- Inclusive knowledge societies and the role of education and ICT

African countries responded massively to ADEA's call. Many development cooperation partners, research institutions, private sector representatives and actors from civil society organizations and youth participated actively in the Forum.

The Forum was the platform to build partnerships to speed up the use and integration of ICT in education and training and to enrich the ADEA 2017 Triennale. In conclusion, we would like to paraphrase Mrs. Oley Dibba-Wadda, Executive Secretary of ADEA, who, on her assumption of office declared that, it is "time to act" and ADEA must provide leadership to ensure that the education agenda in Africa is consistent with the realities, that is, "*education and training drive the acquisition of critical knowledge and skills for employment, peace and prosperity to allow Africans to become a dynamic and driving force around the world*".

Cat.	Full Name	Organisation	Country	Email Address
Expert	Mr. Mamadou N'DOYE	Association for the Development of Education in Africa (ADEA)	Senegal	mam.ndoye@gmail.com
Expert	Mr. SY ISMAÏLA	LCS Technodidac - Les Classiques of Senegal	Senegal	isma.sy@orange.sn
Expert	Mr. Kouassi Eric VIKEY	Benin - Ministry of Planning and Development	Benin	kouassie@gmail.com
Expert	His Excellency Mr. Mamour Alieu JAGNE	African, Caribbean, and Pacific Group of States (ACP)	Belgium	jagne@acp.int
Expert	Mr. Mehdi EZZINE	Centre National des Technologies en Education (CNTE)	Tunisia	mehdi.ezzine@minedu.edunet.tn
Expert	Mr. Kamel KAOUECH	e-Mobile Technologies	Tunisia	k.kaouech@emobiletechnologies.com
Expert	Mr. Michael JUNG	International Association for the Evaluation of Educational Achievement (IEA)	Germany	michael.jung@iea-dpc.de
Expert	Mr. Seindou CISSE	Côte d'Ivoire - Ministry of Higher Education and Scientific Research	Côte d'Ivoire	seindou.6c@gmail.com
Expert	Mr. Samuel AWUKU	University College London (UCL)	United Kingdom	awuku@btinternet.com
Exhibitor	Mr. Serge Stéphane AOUELY	Qelasy	Côte d'Ivoire	stephane.aouely@qelasy.com
Exhibitor	Mr. Ekra KOUASSI HAMED	Qelasy	Côte d'Ivoire	hamed.ekra@qelasy.com
Ministry	Mr. Nessemou Eric GOKPEYA	Côte d'Ivoire - Ministry for the African Integration and Ivorians abroad (MIAIE)	Côte d'Ivoire	e.gokpeya@integration.gouv.ci
Ministry	Dr. Manuel Kavungo MAYIMONA	Angola - Ministry of Education	Angola	
Ministry	Mr. Romeo Prince MUSSA	RDC - Ministry of Primary and Secondary Education & Initiation into New Citizenship	RDC	romeomussa@gmail.com
Ministry	Mr. JohnsaïTandi DEWAH	Zimbabwe - Ministry of Higher and Tertiary Education	Zimbabwe	johndewah@gmail.com
Ministry	Mr. Joseph WAMBUA	Kenya Institute of Curriculum Development (KICD)	Kenya	jwambua46@gmail.com
Ministry	Dr. Abdou SENE	Senegal - Ministry of Higher Education and Research	Senegal	abdou.sene@ugb.edu.sn
Ministry	Mr. Toumane DOUMBOUYA	Senegal - Ministry of Higher Education and Research	Senegal	toumane@hotmail.com
Ministry	Mr. Thierno Aliou DIALLO	Guinea - Ministry of Higher Education and Scientific Research	Guinea	ta.diallo@isfad-gn.org
Ministry	Mrs. NdierebyNgotty DIATTA	Senegal - Ministry of Higher Education and Research	Senegal	ndierebyngotty@gmail.com
Ministry	Mr. Mamadou DIOP	Senegal - Ministry of Higher Education and Research	Senegal	isegcesmi@gmail.com
Ministry	Mr. Ousmane DIOUF	Senegal - Ministry of Higher Education and Research	Senegal	ousmanedf@gmail.com
Ministry	Dr. Mouhamadou Mansour FAYE	Senegal - Ministry of Higher Education and Research	Senegal	mansour.faye@uvs.edu.sn
Ministry	Mrs. Diop AISSATOU SEYDI	Senegal - Ministry of Higher Education and Research	Senegal	aissatou.seydi1@gmail.com
Ministry	Mr. Niane ABOUBAKRY	Senegal - Ministry of Higher Education and Research	Senegal	abniane@yahoo.fr
Ministry	Dr. Samuel OUYA	Senegal - Ministry of Higher Education and Research	Senegal	samuel.ouya@gmail.com
Ministry	Dr. Ibrahima NIANG	Senegal - Ministry of Higher Education and Research	Senegal	ibrahima1.niang@ucad.edu.sn
Ministry	Prof. Ousmane THIARE	Senegal - Ministry of Higher Education and Research	Senegal	othiare@ugb.edu.sn



Ministry	Dr. Seydina Moussa NDIAYE	Senegal - Ministry of Higher Education and Research	Senegal	seydina.ndiaye@mesr.gouv.sn
Ministry	Mr. Henry KAVUMA	South Africa - Ministry for Basic Education	South Africa	Kavuma.h@dbe.gov.za
Ministry	Dr. Nouhou DIABY	Senegal - Ministry of Higher Education and Research	Senegal	ndiaby1@gmail.com
Ministry	Dr. Kauxique MAGANLAL	Mozambique - Ministry of Education and Human Development	Mozambique	kauxique@mined.gov.mz
Ministry	Mr. Abdourahman AHMED	Djibouti - Ministry of National Education & Vocational Training	Djibouti	abdouhag@yahoo.fr
Ministry	Mr. Joseph Elias MBOWE	National Examination Council of Tanzania	Tanzania	mbowej@gmail.com
Ministry	His Excellency Mr. Saku DUKULY	Liberia - Ministry of Education	Liberia	saku2468@gmail.com
Ministry	Mr. Jovin MUKADI TSANGALA	RDC - Ministry of Primary and Secondary Education & Initiation into New Citizenship	RDC	joemukadi2005@yahoo.fr
Ministry	Mr. Serge Thierry TSITOARA	Madagascar - Ministry of Education	Madagascar	tsitoara@gmail.com
Ministry	Dr. Leonard AKWILAPO	Tanzania - Ministry of Education, Science and Technology	Tanzania, United Republic of	akwilapo@gmail.com
Ministry	Prof. Essoham ASSIMA-KPAT-CHA	Togo - Ministry of Higher Education and Research	Togo	assimage@yahoo.fr
Ministry	S.E. Prof. Narciso Damásio Dos Santos BENEDITO	Angola - Ministry of Education	Angola	narcisobenedito@gmail.com
Ministry	Mrs. Dambo Judith Balduina MATEUS	Angola - Ministry of Education	Angola	
Ministry	S.E. M. Jean Martin COULIBALY	Burkina Faso - Ministry of National Education and Literacy	Burkina Faso	
Ministry	Mrs. Catherine KABORE/SAWADOGO	Burkina Faso - Ministry of National Education et de Literacy	Burkina Faso	cathkab@yahoo.fr
Ministry	Mrs. Rochester Mamubi MUSHABATI	Namibia - Ministry of Education, Arts and Culture	Namibia	rmushabati@nied.edu.na
Ministry	Mr. Stanley KANOVENGI	Namibia - Ministry of Education, Arts and Culture	Namibia	skanovengi@gmail.com
Ministry	His Excellency Mrs. Ester Anna Liisa Shiwoomwenyo NGHIPONDOKA	Namibia - Ministry of Education, Arts and Culture	Namibia	ester.nghipondoka@gmail.com
Ministry	Mr. Arzika SABIU	Niger - Ministry of Primary Education, Literacy and the Promotion of National Languages & Civics	Niger	asabiou@yahoo.fr
Minister	S.E. M. Mary Teuw NIANE	Senegal - Ministry of Higher Education and Research	Senegal	
Facilitator	Prof. Hamadou SALIAH-HASSANE	TELUQ	Canada	hamadou.saliah-hassane@teluq.ca
Facilitator	Prof. Mpine MAKOE	University of South Africa (UNISA)	South Africa	qakisme@unisa.ac.za
Facilitator	Mrs. Satu JÄRVINEN	Omnia	Finland	jarvinen.m.satu@gmail.com
Organizer	Mr. GNOLEBA GROGUHE AMEDE	Côte d'Ivoire - Ministry of National Education	Côte d'Ivoire	gnolbat@yahoo.fr
Organizer	Mr. SARR ALIOUNE	Côte d'Ivoire - Ministry of National Education	Côte d'Ivoire	sarhci@yahoo.fr
Organizer	Mr. PEKOULA DELPHIN	Côte d'Ivoire - Ministry of National Education	Côte d'Ivoire	bagoue@gmail.com
Organizer	Mr. ISIDOR MAMBO	Côte d'Ivoire - Ministry of National Education	Côte d'Ivoire	ok.mambo@gmail.com
Organizer	Mr. Abdoul Karim LORN	Côte d'Ivoire - Ministry of National Education	Côte d'Ivoire	kamsolorn@gmail.com
Organizer	Mr. KOUADIO EPHREM YAO	Côte d'Ivoire - Ministry of National Education	Côte d'Ivoire	yaoephrem@yahoo.fr

Organizer	Mr. M'BAYE MALICK	Côte d'Ivoire - Ministry of National Education	Côte d'Ivoire	malckombaye78@gmail.com
Organizer	Mr. Fabrice BOEVI	Microsoft Corporation	Côte d'Ivoire	fabribo@microsoft.com
Organizer	Mr. Aboubacar COULIBALY	Côte d'Ivoire - Ministry of National Education	Côte d'Ivoire	a.coulibaly@education.gouv.ci
Organizer	Mr. Brahim SANGARE	Côte d'Ivoire - Ministry of National Education	Côte d'Ivoire	bsangson@yahoo.fr
Organizer	Mr. NdaywelMbosele LAURENT	United Nations Educational, Scientific and Cultural Organisation (UNESCO)	Gabon	m.ndaywel@unesco.org
Organizer	Mr. Foday KARGBO	Association for the Development of Education in Africa (ADEA)	Côte d'Ivoire	f.kargbo@afdb.org
Organizer	Mr. Khaled SHALABY	INTEL Corporation	Egypt	khaled.said@intel.com
Organizer	Mrs. Akissi Agnes KOFFI	Côte d'Ivoire - Ministry of National Education	Côte d'Ivoire	agnesckoffi@yahoo.fr
Organizer	Mr. Issouf YEO	Côte d'Ivoire - Ministry of National Education	Côte d'Ivoire	issoufyeo@outlook.com
Organizer	Mr. Ouatarra FANGAKALAMA	Côte d'Ivoire - Ministry of National Education	Côte d'Ivoire	ofangakalama@yahoo.fr
Organizer	Mr. Loua Henri YORO	Côte d'Ivoire - Ministry of National Education	Côte d'Ivoire	yorohaymet@yahoo.fr
Organizer	Mrs. Yessoh ANGOUA MARIE GISELE	Côte d'Ivoire - Ministry of Technical and Vocational Training (METFP)	Côte d'Ivoire	marieu1yessoh@gmail.com
Organizer	Mr. Dadie ALBERT	Côte d'Ivoire - Ministry of Higher Education and Scientific Research	Côte d'Ivoire	albert.dadie@mesrs.edu.ci
Organizer	Mrs. Jihane LAGHZALI	INTEL Corporation	Morocco	jihane.laghzali@intel.com
Organizer	Dr. Fengchun MIAO	United Nations Educational, Scientific and Cultural Organisation (UNESCO)	France	f.miao@unesco.org
Organizer	Mrs. Ann Therese NDONG-JATTA	United Nations Educational, Scientific and Cultural Organisation (UNESCO)	Senegal	at.ndong-jatta@unesco.org
Organizer	Mr. Paul CONSTANTIN	International Organisation of La Francophonie (OIF)	France	constantinp@francophonie.org
Organizer	Mr. Joao FIDALGO	INTEL Corporation	South Africa	joao.c.fidalgo@intel.com
Organizer	Mr. David ATCHOARENA	United Nations Educational, Scientific and Cultural Organisation (UNESCO)	France	d.atchoarena@unesco.org
Organizer	Mr. Simon OUATTARA	Microsoft Corporation	Côte d'Ivoire	simonou@microsoft.com
Organizer	Mr. Jaco DU TOIT	United Nations Educational, Scientific and Cultural Organisation (UNESCO)	Kenya	j.dutoit@unesco.org
Organizer	Mrs. Seynabou NDOYE	Microsoft Corporation	Senegal	a-seyn@microsoft.com
Organizer	Mr. Warren LA FLEUR	Microsoft Corporation	South Africa	warren.lafleur@microsoft.com
Organizer	Mrs. Victoria UWADOKA	Microsoft Corporation	Côte d'Ivoire	NDEEUW@MICROSOFT.COM
Organizer	Mr. Joel Alemibola ELEGBE	Association for the Development of Education in Africa (ADEA)	Côte d'Ivoire	j.elegbe@afdb.org
Organizer	Mrs. Oley DIBBA-WADDA	Association for the Development of Education in Africa (ADEA)	Côte d'Ivoire	o.dibba-wadda@afdb.org
Organizer	Mrs. Raky GASSAMA COLY	Association for the Development of Education in Africa (ADEA)	Côte d'Ivoire	r.gassamacoly@afdb.org
ORGANIZER	Mrs. Alexa JOYCE	Microsoft Corporation	Belgium	alexa.joyce@microsoft.com
Organizer	Mr. David MCCARRON	INTEL Corporation	United Kingdom	david.mccarron@intel.com
Organizer	Mr. John GALVIN	INTEL Corporation	United States	john.galvin@intel.com
Organizer	Mr. Carlos MARTINEZ	INTEL Corporation	Nigeria	carlos.martinez@intel.com
Organizer	Mrs. Aissatou SOW	INTEL Corporation	Morocco	aissatou.sow@intel.com
Organizer	Mr. Jerome MORRISSEY	Global e-Schools and Communities Initiative (GeSCI)	Kenya	jerome.morrissey@gesci.org



Organizer	Mrs. Thanh-Hoa DESRUELLES	Global e-Schools and Communities Initiative (GeSCI)	France	thanh-hoadesruelles@gesci.org
Organizer	Mrs. Sanou LEYE DIOP	Association for the Development of Education in Africa (ADEA)	Côte d'Ivoire	s.leye-diop@afdb.org
Organizer	Dr. Patti SWARTS	Global e-Schools and Communities Initiative (GeSCI)	Kenya	patti.swarts@gesci.org
Organizer	Mr. Senthil Kumar MARIMUTHU KOOTHAN	Global e-Schools and Communities Initiative (GeSCI)	Kenya	senthil.kumar@gesci.org
Organizer	Mrs. Mary HOOKER	Global e-Schools and Communities Initiative (GeSCI)	Kenya	mary.hooker@gesci.org
Organizer	Mrs. RamataAlmamy MBAYE	Association for the Development of Education in Africa (ADEA)	Côte d'Ivoire	r.mbaye@afdb.org
Organizer	Mr. Stefano DE CUPIS	Association for the Development of Education in Africa (ADEA)	Côte d'Ivoire	s.decupis@afdb.org
Organizer	Mr. Steve KOISSY-KPEIN	Association for the Development of Education in Africa (ADEA)	Côte d'Ivoire	d.koissy-kpein@afdb.org
Organizer	Mr. Mamy Rijason RAZAFIMAHATRATRA	Association for the Development of Education in Africa (ADEA)	Côte d'Ivoire	m.razafimahatratra@afdb.org
Organizer	Mrs. Aida Mademe SYLLA	Association for the Development of Education in Africa (ADEA)	Côte d'Ivoire	a.m.sylla@afdb.org
Organizer	Mr. Shem BODO	Association for the Development of Education in Africa (ADEA)	Côte d'Ivoire	s.bodo@afdb.org
Organizer	Mr. Aloise Prosper FAYE	Association for the Development of Education in Africa (ADEA)	Côte d'Ivoire	p.faye@afdb.org
Organizer	Dr. Tarek CHEHIDI	Global e-Schools and Communities Initiative (GeSCI)	Kenya	tarek.chehidi@gesci.org
Panelist	Dr. Tiemoman KONE	Côte d'Ivoire - Ministry of Higher Education and Scientific Research	Côte d'Ivoire	tiemoman.kone@mesrs.edu.ci
Paneliste	Mrs. Ngossé FALL	Académy of Thiès	Senegal	ngossefall@yahoo.fr
Panelist	Dr. Michael CHILALA	Examinations Council of Zambia	Zambia	michaelchilala7@gmail.com
Panelist	Mrs. Hendrina DOROBA	Forum for African Women Educationalists (FAWE)	Kenya	HDoroba@fawe.org
Panelist	Mr. John TEMBA	Kenya - Ministry of Education, Science and Technology	Kenya	jtemba@education.go.ke
Panelist	Mr. Mario FRANCO	Millennium@EDUFoundation	Portugal	mfranco@millenniumedu.ngo
Panelist	Dr. Erwan LE QUENTREC	Orange France	France	erwan.lequentrec@orange.com
Panelist	Mrs. Sana GHENIMA	SANABIL MED	Tunisia	sana.ghenima7@gmail.com
Panelist	Mrs. Martha MUHWEZI	Forum for African Women Educationalists (FAWE)	Kenya	MMuhwezi@fawe.org
Panelist	Prof. Gabriel COHN BENDIT	Réseau Education Pour Tous en Afrique (REPTA)	France	jeangabriel.cohnbendit@gmail.com
Panelist	Dr. TemechegnEngida MERINE	UNESCO IICBA	Ethiopia	t.engida@unesco.org
Panelist	Dr. Mona LAROUSSE	French-speaking Universities Agency (AUF)	Tunisia	mona.laroussi@auf.org
Panelist	Mr. Thierry N'DOUFOU	Qelasy	Côte d'Ivoire	thierry.ndoufou@qelasy.com
Panelist	Mr. François BAUDRY	People TV	France	benjamin.riffle@people-television.com
Panelist	Mr. Aziz EL HAJIR	Morocco - Ministry of Education	Morocco	aziz.elhajir@men.gov.ma
Panelist	Mr. Ricaud AUCKBUR	Mauritius - Ministry of Education and Human Resources, Tertiary Education and Scientific Research	Mauritius	rauckbur@govmu.org
Partner	Mr. Didier ARLOT	KA Technologies Group	France	darlot@kadsm.com
Partner	Dr. Victor AGBEGNENOU	KA Technologies Group	France	contact@katecgroup.com

Partner	Mrs. Séverine DONNET-DESCARTES	Swiss Agency for Development and Cooperation (SDC)	Côte d'Ivoire	severine.donnet-descartes@eda.admin.ch
Partner	Mrs. Jocelyne BOSSON	French-speaking Universities Agency (AUF)	Côte d'Ivoire	jocelyne.bosson@auf.org
Partner	Mrs. Nodumo DHLAMINI	Association of African Universities (AAU)	Ghana	ndhlamini@aau.org
Partner	Mr. Zhang XIAYU	Huawei Technologies	Côte d'Ivoire	zhangxiaoyu@huawei.com
Partner	Mr. Liu ZEMIN	Huawei Technologies	Côte d'Ivoire	lionel.liu@huawei.com
Partner	Mr. Najib RHIATI	Islamic Organisation for Education, Science and Culture (ISESCO)	Morocco	narhiati@gmail.com
Partner	Mr. Alioune Badara NDIAYE	Aide et Action International Afrique	Burkina Faso	sadia.ndiaye@aide-et-action.org
Partner	Mr. Ndiaga Mahip DIOP	Conférence des ministres de l'Éducation des Etats et gouvernements de la Francophonie (CONFEMEN)	Senegal	nmdiop@confemen.org
Partner	Dr. Capo CHICHI ALAIN	Groupe CERCO	Côte d'Ivoire	a.capo@groupecerco.com
Partner	Mr. Damase ZOURE	Aide et Action International Afrique	Côte d'Ivoire	zoure.damase@aide-et-action.org
Partner	Mr. Mohamadou Arabani SAIBOU	Ecole Supérieure Multinationale des Télécommunications (ESMT)	Senegal	mohamadou.saibou@esmt.sn
Partner	Dr. Hamidou BOLY	Economic Community of West African States (ECOWAS)	Nigeria	hboly@ecowas.int
Partner	Mr. Anthony BLOOME	United States Agency for International Development (USAID)	United States	abloome@usaid.gov
Partner	Mrs. Esther GACICIO	Kenya Institute of Curriculum Development (KICD)	Kenya	egacicio@kicd.ac.ke
Partner	Mrs. Inge VERVLOESEM	United Nations Children's Fund (UNICEF)	Senegal	ivervloesem@unicef.org
Partner	Mr. Tae-Hun KWON	Korea Education and Research Information Service (KERIS)	Korea, Republic of	lufu95@keris.or.kr
Partner	Mr. Min KIM	Korea Education and Research Information Service (KERIS)	Korea, Republic of	minkim@keris.or.kr
Partner	Mrs. Elizabeth WEST	Jacobs Foundation	Côte d'Ivoire	elizabeth.west@trecc.ci
Partner	Mr. Laurent CORTESE	French Development Agency (AFD)	Côte d'Ivoire	cortesel@afd.fr
Partner	Mrs. Laurianne LE LEM	French Development Agency (AFD)	Côte d'Ivoire	leleml@afd.fr
Partner	Mr. Yao YDO	United Nations Educational, Scientific and Cultural Organisation (UNESCO)	Côte d'Ivoire	y.ydo@unesco.org
Partner	Dr. Callistus OGOL	African Union Commission (AUC)	Ethiopia	Ogolc@africa-union.org
Partner	Mrs. FiauxNiada MARY-LUCE	Swiss Agency for Development and Cooperation (SDC)	Benin	mary-luce.fiauxniada@eda.admin.ch
Partner	Mrs. Sabina VIGANI	Jacobs Foundation	Côte d'Ivoire	sabina.vigani@jacobsfoundation.org
Media	Mr. Kennedy ABWAO	Pan African News Agency (PANA)	Kenya	abwaokenn@gmail.com
Media	Mr. Adrien BIZIEAU	People TV	France	benjamin.riffle@people-television.com
Media	Mr. Yameogo PARATEBA	Promotion de l'Audiovisuel pour l'Éducation en Afrique (PAVEA)	Burkina Faso	paratebayameogo@yahoo.fr
Media	Mr. Jean-Claude FRISQUE	Promotion de l'Audiovisuel pour l'Éducation en Afrique (PAVEA)	Burkina Faso	jc.frisque@gmail.com
Rapporteur	Prof. Roger Marcelin FAYE	Ecole Supérieure Polytechnique de Dakar	Senegal	roger.faye@ucad.edu.sn
Rapporteur	Prof. Claude LISHOU	Ecole Supérieure Polytechnique de Dakar	Senegal	claudelishou@gmail.com
Sponsor	Mr. Mathias GOLDSTEIN	African Virtual University (AVU)	Kenya	mgoldstein@avu.org
Sponsor	Mr. Moïse Désiré KOUAKOU	Qelasy	Côte d'Ivoire	moise.kouakou@qelasy.com
Sponsor	Dr. João LOPES	JP Sá Couto - Inspiring Knowledge	Portugal	jplopes@jpsacouto.pt

General Coordinators of the Forum:

Mr. Brahim Sangaré, MEN Côte d'Ivoire : bsangson@yahoo.fr

Dr. Tarek Chehidi, GESCI : tarek.chehidi@gesci.org

Mr. Shem Bodo, ADEA : s.bodo@afdb.org

Media contacts:

Mr. Said Dosso, Communication Assistant, Ministry of National Education, Côte d'Ivoire, T. +225 20222957, youngsaid13@gmail.com

Mr. Stefano De Cupis, Senior Communications Officer, ADEA, T. +225 2026 4261, s.decupis@afdb.org

Mrs. Thanh-Hoa Desruelles, Senior Expert, Advocacy, Partner Relations and Communications, GESCI

Team of Forum rapporteurs:

Prof. Claude Lishou, ESP/UCAD : claudio.lishou@ucad.edu.sn

Prof. Roger M. Faye, ESP/UCAD: roger.faye@ucad.edu.sn

Mrs. Mary Hooker, GESCI : mary.hooker@gesci.org

Dr. Frédéric Holo, ENS/Abidjan : amonholo@gmail.com



Association for the
Development of
Education in
Africa