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International Centre
for Higher Education Innovation
under the auspices of UNESCO
联合国教科文组织高等教育创新中心



Synthesis Report of Seminar on ICT in Higher Education Innovation for African Countries 2017

Botswana, Cameroon, Djibouti, Egypt, Ethiopia, Ghana, Malawi



August 7-27, 2017
Shenzhen, China

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of
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Acknowledgements

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Contributors & Editors

LI Ming

BI Xiaohan

LI Xue

SONG Hang

ZHU Kejin

Published by

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Shenzhen, Guangdong 518055 P. R. China

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Chapter 1

Higher Education in Africa

The past 40 years have witnessed great progress and, undeniably, big problems in higher education development in sub-Saharan Africa. The number of students receiving higher education experienced a two-fold increase from 2.7 million to 9.3 million in Sub-Saharan Africa from 1991 to 2006 (World Bank, 2010). In the past 40 years, the average annual growth rate of higher education enrollment in Sub-Saharan Africa reached 8.4%, compared to a global average of 4.3%. By 2010, the number of enrolled students in higher education institutions in sub-Saharan Africa had amounted to 4.8 million, a 20-time increase compared with that in 1970. Should the current growth rate continue, there will be a dramatic increase of university students in the coming 10 years and a more challenging problem of student admission is to rise at that time. Therefore, how to scale up access to higher education to meet the demand of people is a significant issue in most African countries.

According to the University Rankings website, by February 2017, there had been 1,497 universities in Africa. However, the rapid development of higher education scale is to some degree realized at the cost of education quality.

How to balance accessibility and quality of higher education is posing a great challenge to Sub-Saharan Africa. Problems such as isolation from social context, outdated teaching methods, inadequacy of university teachers in quality and quantity, backward administration system and so forth, have seriously impeded higher education development, and consequently, social and economic advancement in African countries. Consequently, many African countries gradually pay more attention to safeguarding higher education quality, a key field of the work of UNESCO. Additionally, poor information communication technology (ICT) infrastructures have hindered the innovation and development of higher education in Africa.

The rapid development of ICT has changed the traditional education development modes and exerted significant influence on issues such as methods of teaching and learning, ways and means of providing education, education administration and teachers' professional development. It has been pointed out in Qingdao Declaration by UNESCO that "technology offers unprecedented opportunities to reduce the long-existing learning divide". The emergence of Massive Open Online Courses (MOOCs), Open Educational Resources (OERs) and Open, Distance and e-learning (ODEL)

provides more access to high quality learning and effectively reduces the high cost of higher education in Africa. They may serve as effective solutions to a series of problems in the development of African higher education. Therefore, it is suggested that African countries should fully explore the potential of education informationalization, increase access to higher education, facilitate dissemination of knowledge and information, promote innovation in higher education system, and improve quality and efficiency of education to achieve education equity.

The International Centre for Higher Education Innovation under the auspices of UNESCO (UNESCO-ICHEI) was approved at the 38th General Conference of United Nations Educational, Scientific, and Cultural Organization (UNESCO) on November 13th, 2015. It is the 10th UNESCO Category 2 Centre in Education in the world and the 1st Category 2 Centre in Higher Education in China. UNESCO-ICHEI has always adhered to the purpose and mission of UNESCO, and draws on the advantages of ICT industries in Shenzhen and China's experience of popularizing higher education. Through four major functions of knowledge production, capacity building, technical support and information sharing, UNESCO-ICHEI provides services to UN members, devotes itself to narrowing the gap of higher education between developing and developed countries, creates conditions for the open learning of lifelong learners, and promotes the development, quality and equity in higher education in developing countries in Asian-Pacific region and Africa. The UNESCO Shenzhen Funds-in-Trust project was established based on the agreement between Shenzhen Municipal Government and UNESCO in 2015. Shenzhen Municipal Government donated 2 million US dollars to UNESCO, 75% of which will be used in Africa and 25% of which in Asia with a 3-year implementation cycle (2016-2018). UNESCO-ICHEI is playing an active role in the UNESCO Shenzhen Funds-in-Trust project.

Against this backdrop, sponsored by the Ministry of Commerce of China and jointly organized by Shenzhen Association for Promoting International Economic & Technological Cooperation, the Center for Higher Education Research (CHER) of Southern University of Science and Technology (SUSTech) and UNESCO-ICHEI, the "Seminar on ICT in Higher Education Innovation for African Countries 2017" was held in SUSTech from August 7 to 27, 2017. The seminar aims to achieve the mission of UNESCO-ICHEI, i.e.,

to draw on the advantages of information and communication technological enterprises in Shenzhen and China's experience of popularizing higher education, to create conditions for the open learning of lifelong learners, to meet the demands for quality higher education resources, to help improve higher education quality in Asian and African developing countries, especially those along the maritime silk road, and to promote the educational equality. This seminar provided specific trainings on ICT application capacity to the representatives of ministries of education and universities from the project countries and non-project countries, through which the ICT skills and application capacity of the African participants were improved. Meanwhile, the seminar provided an opportunity for UNESCO-ICHEI to gain a deeper understanding of and conduct analysis on the ICT development and ICT application in higher education in different African countries, laying a solid foundation for UNESCO-ICHEI to carry out works in Africa in the future.

In total, 32 government officials of departmental and divisional levels in higher education systems, university senior officials and professors from 7 African countries, i.e., Ethiopia, Egypt, Djibouti, Ghana, Malawi, Cameroon and Botswana, participated in the seminar and studied theories and practices of ICT application in higher education.

In this seminar, specific curriculums on policies, ICT-enabled teaching and learning, ICT technologies and general knowledge were designed in accordance with the background of the participants. Besides, focusing on ICT application in higher education, both theoretical and practical curriculums were designed and experienced lecturers specialized in higher education policy making, pedagogy, online education and ICT techniques were invited to provide various quality courses. In addition, participants were arranged to visit and communicate with universities and enterprises with advanced experience in higher education innovation, such as Weidong Cloud Education Group, Huawei, XuetangX, Tsinghua University, Beijing Normal University, South China Normal University, Createview Group, Shenzhen AEE Technology, Shenzhen Metro and so forth. All the participants believed that this seminar was a study trip of considerable practical significance, which greatly enriched their understanding on ICT application in higher education, broadened their expertise in relevant fields and offered them opportunities to observe and study the experience of educational

Higher Education in Africa

informationalization in China. The seminar showcased China's achievements in terms of ICT application in higher education, which helped participants to fully understand and draw lessons from China's experience and strength in the field of ICT in higher education that can then be implemented in their countries to strengthen their own higher education system.

During the seminar, representatives of government and universities from the 7 countries thoroughly discussed the application of ICT in higher education in their respective countries and made final presentations on said topic. In order to maximize the effect of this Seminar and further share these output to more countries, UNESCO-ICHEI compiled the curriculums, final presentations of the participants and other relevant information of the Seminar into this Synthesis Report, allowing a better understanding of the Seminar and higher education in these 7 countries for more people.



Chapter 2

Overview of the Seminar

- 2.1 Objectives and Implementation Scheme
- 2.2 Training Module
- 2.3 Participants
- 2.4 Lecturers
- 2.5 Partners

2.1 Objectives and Implementation Scheme

2.1.1 Objectives

In general, the seminar aims to improve staff competency in terms of ICT application in higher education in all perspectives, to help member states achieve UNESCO Education 2030 goals. The seminar hopes that



Policy makers and university decision-makers can:

Enhance understanding of ICT in higher education; Gain new insights of ICT-enabled/enhanced higher education innovation; Strengthen the capacity of ICT policy making;



University professors/lecturers can:

Improve ICT literacy and engagement of using ICT in teaching and learning; play active role of embedding ICT into higher education;



Technicians can:

Raise awareness of technology's role in higher education and adapt their expertise into the development of university.

2.1.2 Implementation Scheme



To achieve the objectives, UNESCO-ICHEI encourage all participants to follow the implementation scheme:

Before the Seminar

◆ Task Contents

- ※ Take stock of the policies and programmes of ICT Application in Education in the project countries/Universities.
- ※ Take stock of the academic papers regarding the ICT Application in Education in the project countries.
- ※ Take stock of classic cases of ICT Application in Education in the project countries/universities.
- ※ Take stock of photos/logos/models/videos regarding the localization of ICT Application in Education.

◆ Task Requirements

- ※ Submission of the above-mentioned documents/materials.
- ※ Prepare the PowerPoint presentation according to the documents collected.

During the Seminar

◆ Task Objectives

- ※ Complete the Seminar courses and build capacity according to their respective backgrounds.
- ※ Formulate a Country/University based Proposal of ICT Application in Education. The Proposal should be co-authored by three groups of participants: policy makers, teachers and ICT technicians, with each group undertaking different sections, namely policy making, ICT-enhanced Teaching and Learning, and ICT Infrastructure.

◆ Task Contents

- ※ Form task group by nation or university and raise awareness of the necessity, objectives and importance of ICT capacity building in the

Overview of the Seminar

project countries/universities;

- ✘ Formulate the respective Country/ University ICT Application Proposal concerning policy making, administration, application in Teaching and Learning, Evaluation and ICT Infrastructure, based on the courses, study visits and workshops offered during the Seminar.
- ✘ Formulate a draft proposal of ICT Application in Education.
- ✘ Make PowerPoint presentation or poster of the draft proposal of ICT Application in Education for mutual communication and information sharing.

Follow up

◆ Task Objectives

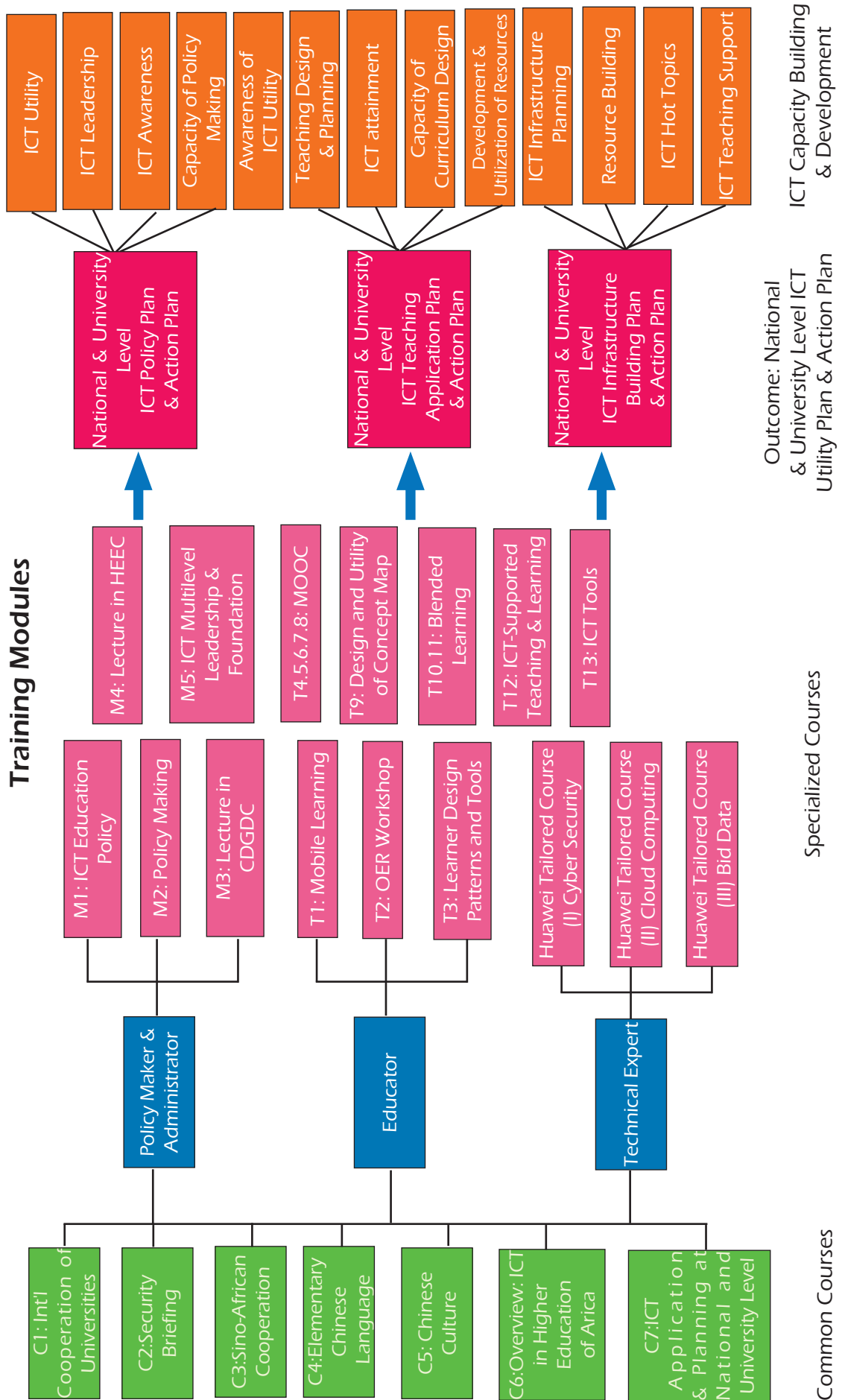
- ✘ Gain awareness of participants' personal and professional development henceforth and impacts of the Seminar on them, hereby to serve as the foundation for further improvement of the Seminar.

◆ Task Contents

- ✘ Gain understanding of impacts of the Seminar on participants' professional development in the future.
- ✘ Gain awareness of the evolution of participants' ICT demand.

2.2 Training Modules

The Seminar is mainly designed for high-level participants from Africa countries. Participants are officials from government including Ministry of Education, University leaders and professors, and ICT experts. In view of the difference of backgrounds, the Seminar is designed to give specialized trainings for policy makers, pedagogical staff and ICT technology experts.



Overview of the Seminar

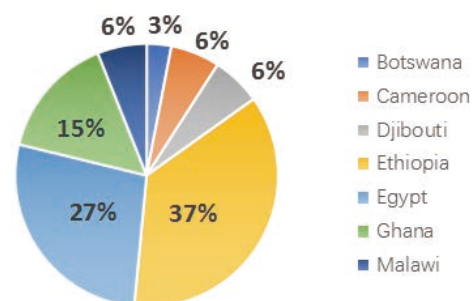
Thus, the Seminar is composed of four modules, which are: ICT policy and management, ICT-enabled teaching and learning, ICT technology, and common courses. Lecturers specialized in these four domains are invited to give relative courses. The courses are designed in consultation with lecturers, experts from UNESCO-ICHEI, advisors from universities and representatives from 7 participating countries. Participants are recommended to customize their own study plan by choosing the specialized courses according to their professional backgrounds, while common courses, field studies and visits are open to all.

2.3 Participants

2.3.1 Overview

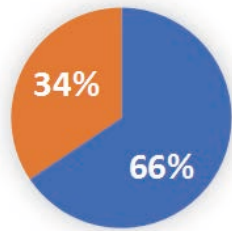


Seminar on ICT in Higher Education Innovation for African Countries 2017 is designed for government officials, academic staff and technicians in universities from African countries. In the end, 32 participants from 7 African countries applied and joined in the Seminar. The 7 countries are Botswana, Cameroon, Djibouti, Ethiopia, Egypt, Ghana, Malawi.



Participants by Country

21 participants work for university and 11 work for government.

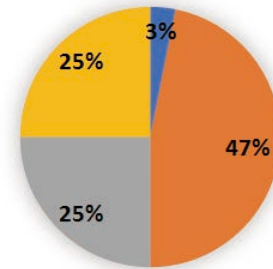


■ University ■ Government

Participants by Profession

When recruiting participants, the organizer of the seminar called for attention on gender equality. Among 32 participants, 24 are male and 8 are female. Yet it still can be improved by getting more female participants involved in the future.

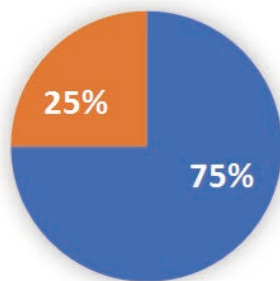
The age of the participants ranges from 28 to 58. Half of the group is older than 40. The biggest age group is 30-39, while 15 people fall into this group.



■ 20-29 ■ 30-39 ■ 40-49 ■ 50-59

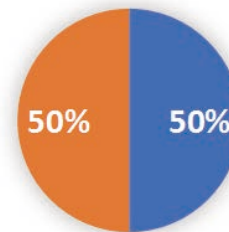
Participants by Age

Out of 32 participants, 16 people hold PhD. Degree.



■ Male ■ Female

Participants by Gender



■ Doctor ■ Other

Participants Education Background

2.3.2 Participants Lists

Botswana

	Full Name	Title/Institution
1	MPHO LESOGO	Principal Computer Programmer, Ministry of Education

Cameroon

	Full Name	Title/Institution
1	Dr EMILE KENMOGNE	Professor of Philosophy, Service Inspector, Ministry of Higher Eductaion
2	FRANCOISE NJA MVE EPSE ZOALANG ENAMA	Director of Financial Office, University of Yaounde I

Djibouti

	Full Name	Title/Institution
1	Dr MAGTERRY IBRAHIM	Lecturer, University of Djibouti
2	ABDOULK ADER OSMAN GUEDI	Assistant professor, University of Djibouti

Egypt

	Full Name	Title/Institution
1	Dr ABDELNASSER B I SINGAB	Vice President, Ain Shams University(ASU)
2	Dr EMADELDIN MAHMOUD H HASSAN	Vice Dean of Faculty of Engineering for post graduates & research, Ain Shams University(ASU)
3	Dr MOHAMED SHERIF A M AHMED	Director for Department of Project Developments, Associate Professor, Ain Shams University(ASU)
4	Dr ESRAA ABDELSAYED H MOHAMED	Head of International Office, Professor, Ain Shams University(ASU)
5	Dr BASSANT ABDELHAMID M AHMED	Assistant Professor, Faculty of Engineering, Ain Shams University(ASU)
6	Dr MICHAEL NAIEM A IBRAHIM	Assistant Professor, Faculty of Engineering, Ain Shams University(ASU)
7	Dr SHERIN MOHAMED M MOUSSA	Associate Professor, Faculty of Computer and Information Sciences, Ain Shams University(ASU)
8	MOHAMED ADEL A E KANDEL	Network Admin, Ministry of Higher Education

Ethiopia

	Full Name	Title/Institution
1	Dr TIBEBE BESHAIH TESEMA	Assistant Professor of Information System, Coordinator of IS PhD Program, Addis Ababa University (AAU)
2	Dr SALEHU ANTENEH TEMARE	Director of IT Doctoral Program, Addis Ababa University (AAU)

(continue on next page)

(continued)

3	Dr MESSAY MULUGETA TEFERA	Assistant Professor, Coordinator of PhD Program at College of Development Studies, Board Member of BHU, Addis Ababa University (AAU)
4	Dr YALEMZEWD NEGASH SHIFERA	Assistant Professor, Dean of School of Electrical and Computer Engineering, Addis Ababa University (AAU)
5	YOSEF SHIFERAW RETA	Director of ICT, Addis Ababa University (AAU)
6	DANIEL ABEBE NEGASH	Chair, Information Technology, Assistant Professor, Addis Ababa University (AAU)
7	Dr DAGMAWI LEMMA GOBENA	Chair of Computer Science Department, Assistant Professor, Addis Ababa University (AAU)
8	TIGABU DAGNE AKAL	Head of Center of Information Technology and Scientific Computing, Addis Ababa University (AAU)
9	Dr SURAFEL LEMMA ABEBE	Chair of Computer Engineering, Assistant Professor, Addis Ababa University (AAU)
10	ZELALEM ASSEFA AZENE	Director of Education and Research Network, Ministry of Education
11	HAREGEWOIN MIROTAW SHUMIYE	Director of IT and Data Center, Ethiopian Investment Commission
12	ZELALEM LEMMA AYANO	Information Technology Expert, Ethiopian Investment Commission

Ghana

	Full Name	Title/Institution
1	RUTH ODI TURKSON	Senior Administrator, Tertiary Education, Ministry of Education
2	SAMUEL ADJETEY OKANG	Deputy Director, National Coordinator, Ministry of Education
3	PAA KODWO SAM	Assistant Director, Tertiary Education, Ministry of Education
4	PAULINA ANSAH	Assistant Director, Pre-Tertiary Education, Ministry of Education
5	AZUMI RITA YUSSIF	Principal Computer Programmer, Ministry of Education

Malawi

	Full Name	Title/Institution
1	HUBERT KANYOMA	IT Manager, University of Malawi
2	WALUSUNGU GONDWE	IT Manager, Malawi University of Science and Technology

2.4 Lecturers



Prof. Dr. LI Ming

Director of UNESCO-ICHEI

Former Chairperson of University Council of Southern University of Science and Technology (SUSTech)

Dr. LI Ming has the qualification of associate professor and a doctoral degree in management from the School of Management, Xi'an Jiaotong University. From July 1982 to May 1992, Li Ming was a lecturer and then an associate professor (December 1988) in the Program of Political Economics, Department of Social Sciences in Xi'an Jiaotong University, with research interest in policy studies of macro-economics.

In May 1992, he moved to Shenzhen. For the two decades after that, he worked in many important government positions, which include Division Chief of the Policy Research Office of the Shenzhen Municipal Committee of the CPC, Director of Luohu District Economic Development Board of Shenzhen, Deputy District Head of the Shenzhen Luohu District People's Government, Director of Longgang District People's Congress Standing Committee, Vice Mayor of the Shenzhen People's Government, Director of the Shenzhen Public Security Bureau, Deputy Secretary of Shenzhen Politics and Law Committee, and member of the Shenzhen CPC Standing Committee. Through his long and distinguished career in government and on many different positions, Dr. Li has gained rich experiences in economic policy-making and public administration, acquired in-depth knowledge about the society and economy of Shenzhen, and developed a keen understanding about the critical role that higher education can play for his second hometown Shenzhen. In January 2014, Ming Li was appointed the Chairperson of University Council of SUSTech, and in September, the acting president during SUSTech's presidential search. Excited to return to his beloved field of higher education, Dr. Li is committed to the mission and goals of SUSTech and dedicated to leading SUSTech to become a globally recognized excellent research university.

Course Delivered in the Seminar:

- keynote speech on Forum on Higher Education Innovation: University Cooperation and Innovation



Prof. Dr. Abdel Nasser Badawi Singab

Vice President for postgraduate studies and research
Ain Shams University

He is also a consultant of the Minister of Health and Population for the Pharmaceutical affairs, Egypt. He was the Chairman of the grievance committee of Pharmacists internship at the Ministry of Health in 2015. Professor Abdel Nasser Badawi Singab has developed research collaboration with scientists from the countries of Finland, Japan, Germany, China and South Korea since 2002. He has contributed to the cooperation agreement in the field of traditional Chinese medicine between Heilongjiang University of Chinese medicine and Ain Shams University.

Professor Abdel Nasser Badawi Singab has published books, book chapters and numerous research articles in local and internationally reputed journals. He has been the executive editor for the American journal "Medicinal & Aromatic plants", a member in the editorial board of the American journal "Journal of Pharmacology & Therapeutics", a reviewer in many international scientific journals such as Atherosclerosis, Pharmaceutical biology, Chinese herbal medicine, Ethiopian Pharmaceutical Science & Aromatic & Medicinal Plants .etc. Professor Abdel Nasser Badawi Singab received his Bachelor's degree in Pharmaceutical Sciences from Zagazig University and Master's degree in Pharmacognosy from AL-Azhar University. He holds a PhD in Pharmacognosy from AL-Azhar University with a PhD channel program in Meiji University of Pharmacy.

Course Delivered in the Seminar:

- keynote speech on Forum on Higher Education Innovation: University Cooperation and Innovation



Dr. QU Jian

Vice President, China Development Institute,
Expert Committee Member of Ministry of Commerce of China,
SEZ Consultant of Asian Development Bank,
Professor and Post-doctoral Researcher in Economics,
Registered Consulting Engineer

Overview of the Seminar

Dr. Qu Jian specializes in industrial economy, regional development strategy and development of special economic zones and industrial parks. During his career of more than 25 years, he hosted more than 100 research projects for public policy makers, as well as various feasibility studies of regional development and investment for the foreign and domestic enterprises. Since 2012, Dr. Qu and Chinese team provided consultation on master planning, industrial planning, spatial planning, investment feasibilities and legislation proposals for special economic zones and industrial parks in many countries, including Ethiopia, India, Republic of Congo, Kenya and Sri Lanka. These projects are highly appraised by World Bank, Asian Development Bank and the host country government. Dr. Qu has written over 100 academic papers, mostly of which are on FDI and regional development. He also makes lots of appearances in economic programs on TV.

Course Delivered in the Seminar:

- **Recent China-Africa Cooperation**



Jaco du Toit

*Adviser for Communication and Information,
UNESCO Regional Office for Eastern Africa in Nairobi*

Jaco du Toit has been working with UNESCO since 1998 and worked in North Africa, Southern Africa, Eastern Africa and the Arab States. Work in these countries focused among other thematic themes on Information and Communication Technologies (ICT) in the field of Education, Science and Culture and community media development. He is leading ICT in Education initiatives in several countries in Eastern Africa focusing on ICT and Teacher training initiatives, Open solutions, ICTs and disabilities and promoting knowledge societies. He also worked extensively in capacity development initiatives for community radios aiming at bridging the gap between poor people-specially women and girls-and the public debate on issues of local public concern. This is achieved through capacity-building activities in local radio stations, improving the programming quality, providing training on the use of ICTs and helping them to increase their geographical range of news coverage with a network of correspondents.

Courses Delivered in the Seminar:

- Overview of ICT in Higher Education in Africa;
- Knowledge Society and ICT Policy Making Workshop;
- Open Educational Resources Workshop

**Aurora CHEUNG**

Associate Project Officer,
UNESCO Regional Office for Eastern Africa in Nairobi

Aurora Cheung has worked for UNESCO since 2012, first joining UNESCO Headquarters in Paris, then moved to UNESCO Regional Office for Eastern Africa in Nairobi in 2015. She received a B.A. in language and translation, and a post-graduate diploma in education, both from the University of Hong Kong. She also received a M.A. in language education from the Institute of Education, United College London. She has managed ICT in education and teacher training projects in over 10 countries in Eastern, Western, Central, and Southern Africa. Prior to joining UNESCO, she was a teacher and an examiner for four years in Hong Kong.

Course Delivered in the Seminar:

- Knowledge Society and ICT Policy Making Workshop

**Prof. Dr. LAW Nancy W.Y.**

Professor in the Division of Information Technology in Education, Faculty of Education at the University of Hong Kong

Dr. LAW Nancy W.Y. is a professor in the Division of Information Technology in Education, Faculty of Education at the University of Hong Kong (<http://web.edu.hku.hk/staff/academic/nlaw>). She served as the Founding Director for the Centre for Information Technology in Education (CITE) for 15 years

Overview of the Seminar

from 1998. Her key research focus is on studying technology-enhanced pedagogical innovations for learning at student, teacher and school levels to inform leadership and policy models for scalable change at institutional and system levels. She is currently leading a learning design technology for teacher learning project, and a major interdisciplinary research project on learning and assessment of digital citizenship from childhood to early adulthood.

Courses Delivered in the Seminar:

- **Creating a Multilevel Leadership Infrastructure for ICT-enabled Higher Education Innovation;**
- **Workshop on Using Learning Design Patterns and Tools to Integrate ICT into Higher Education**



Dr. MIAO Fengchun

Chief of the Unit for ICT in Education
at UNESCO Headquarters

Dr. MIAO Fengchun is the Chief of the Unit for ICT in Education at UNESCO Headquarters in Paris. He is leading several major global ICT in education programmes of UNESCO Education Sector including on ICT in Education Policy, Harnessing ICT to Achieve Education 2030, UNESCO ICT Competency Framework for Teachers (ICT-CFT), Open Education Resources, Mobile Learning, and UNESCO Prize for the Use of ICT in Education. He has launched several flagship ICT in education events of UNESCO, including UNESCO's annual Mobile Learning Week and been running it for 6 years consecutively, the Asia-Pacific Ministerial Forum on ICT in Education, and the African Ministerial Forum on ICT in Education. He conceptualized and coordinated UNESCO's International Conference on ICT and Post-2015 Education as well as the drafting and adoption of the Qingdao Declaration on leveraging ICT to achieve Education 2030.

Based on 11 years of experience working in UNESCO and drawn lessons learned from serving more than 60 countries directly, he has deepened his understanding about the use of ICT for access to learning opportunities,

enhancement of quality of education and learning, provision of education service, and education management. Before joining UNESCO, Dr. Miao was the Director General of the National Research Centre for Computer Education, Ministry of Education, China. In that capacity, he was responsible for the development of ICT in education policy and ICT standards and managing the National Association for the Use of ICT in K-12 Schools of China. Highlights of his achievements during that period include National Guidelines for Curriculum Reform for China K-12 Schools, National ICT in Education Master Plan 2005-2010, ICT Curriculum Standards for Students (K-12), China Educational Technology Standard for Teachers, and five series of ICT textbooks for students.

Course Delivered in the Seminar:

- **Harnessing ICT for Achieving SDG 4 Education 2030**



ZHAO Jing

Instructor, Huawei Global Technology Training Center

Ms ZHAO has 10 years plus ICT industry work experience. She's the first lady to get Huawei Certified Internetwork Expert Cloud certificate. As a Huawei certified trainer, she is authorized to deliver courses like Cloud computing course, including HCNA/HCNP/HCIE-cloud, Fusion Sphere related cloud computing products delivery; Storage series courses, including storage foundation and Server SAN; and Bigdata series course, including Huawei Bigdata Solution and Bigdata Cutting-edge Technology & Trends.

Proficient in Japanese and English, Ms ZHAO Jing has multi-languages delivery ability. She's experienced in international delivery. Her customers come from Japan, Pakistan, Saudi Arabia, Africa and Latin America. She has also supported many important projects including Ethiopia INSA Training, Ethiopia YEKA Project, Algeria MOHE Cloud Datacenter Project, Saudi Arabia National Grid SA Training, Pakistan UET HCNP-Cloud training, Japan Halp HCS-Field-Server Training Standard Training, Cuba ENERGOIMPORT Training project Server E9000 delivery, South Pacific Area HCIE-Cloud Interviewing Online Training, CSC Internal employee VDI technology

Overview of the Seminar

principle training, LotusNotes, O365 etc. office application training.

She graduated from Tianjin University of Technology with Bachelor Degree. Before joining Huawei, she worked as Team Leader for CalTek Technology International.Inc, responsible for Aisa Five-Star hotel network maintenance and customer complaints from 2012-2014 and Computer Sciences Corporation(CSC), Japan Region SME, responsible for new hires' training and client IT technical support from 2014-2016.

Courses Delivered in the Seminar:

- Cloud Computing Training;
- Big Data Overview



JI Xiaodong

Instructor, Huawei Global Technology Training Center

Pay special attention to Cyberspace Security and Case Based teaching and learning Since 2004, be responsible for emergency response to bank network security incident. Since 2012, be responsible for information security risk assessment and emergency response plan. Since 2016, development training courses of routing and switching and network security.2016.9, "Your Future Starts Here with HCIE", an online speech on the development of network technology. 2016.12, HCNP-Security online training course.

Course Delivered in the Seminar:

- Network Security Trends and Solutions



Dr. LIU Haiming

Senior lecturer in computer science and technology,
University of Bedfordshire UK

LIU Haiming worked in various the UK Universities since her successful completion of her PhD in 2010, namely The Open University, University of Central Lancashire and University of Bedfordshire. Her research interests are in Human-Computer Integration, Personalized and Interactive Multimedia Information Retrieval and Seeking, technology enhanced learning and teaching, user modelling and e-business. She has been publishing high quality papers in related research communities. Her interdisciplinary research and experience of working with companies has contributed to a number of winning projects, for example, a recent winning of a four years highly prestigious H2020 Marie Curie Innovative Training Network grant on adaptive information retrieval funded by European Research Commission and a two years Knowledge Transfer Project on Internet of Things for Soil System funded by UK Technology Strategy Board. Haiming teaches all computer science related subjects at BSc and MSc level. She also supervises all level of student projects, including graduate level projects, post graduate level projects and PhD project. So far she has supervised four PhD students to successful completions. She is currently supervising five on-going PhD students. Two further PhD students are to join her research team in October 2017.

Course Delivered in the Seminar:

- Fundamentals of User Interaction Design



Prof. Dr. MU Su

Professor at School of Information Technology in Education, South China Normal University (SCNU), vice director of Modern Distance Education Institute of SCNU and chief experts of National Teacher Training Program on ICT in education

Dr. Mu had been visiting researcher in Knowledge Media Institute of Open University of UK and visiting professor in San Francisco State University in US. She focuses on research and practice of distance education, online teaching and learning, design and implement of online course, online plus offline hybrid learning. She has published more than 30 papers in academic journals and 10 books based on her research and practice. She teaches 4 courses for under program student and 2 courses of master student in O+O hybrid learning, designed and organized online training projects on ICT enhanced Teaching for teachers in Guangdong, Hannan, Guangxi, Xinjiang,

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Jiangxi and so on and has rich experience about distance education and online teaching. Dr. MU has many publications, including Deepening and Reconstruction: Mobile Learning and Online Education, Promote Development of Learning- Teaching and Learning Theory and Approach in Cyber World, Research and Teaching Capacity Building for Teachers in ICT World, Lifelong Learning Capacity Building for Teachers in ICT Environment.

Course Delivered in the Seminar:

- MOOC: Design, Implement and Applicate Online Course



Prof. Dr. ZHAO Jianhua

Professor and Deputy Director of the Research Center for Higher Education, Southern University of Science and Technology (SUSTech), Senior Expert of UNESCO International Center for Higher Education Innovation

Before Prof. ZHAO joined SUSTech, he had been working in the School of Information Technology in Education as Deputy Dean and Professor for more than 20 years. Prof. ZHAO got his PhD from South China Normal University, China in 2002, and the University of Sheffield in 2006. He is a EC member of Global Chinese Society of Computer in Education, an advisor of Macau Society for ICT in Education, a Teaching Steering Committee member of Guangdong Elementary Education, and etc. Prof. ZHAO have conducted more than 40 research projects and published more than 100 journal papers. Prof. ZHAO is member of numerous editorial board, e.g., Journal of Computers in Education, Journal of Technology Enhanced Learning, and International Journal of Social Media and Interactive Learning Environments. His research interests include ICT-supported Learning and Teaching, Learning Sciences and Technologies, Teachers' Professional Development etc.

Course Delivered in the Seminar:

- ICT Application & Planning at National and Institutional Level

Facilitators

**BI Xiaohan**

Programme Officer, Africa Programme Office, UNESCO-ICHEI

BI Xiaohan is currently a programme officer of UNESCO-ICHEI, working in the field of African Higher Education. Before joining UNESCO-ICHEI, she worked in UNESCO-Libreville (Gabon) for one year, sponsored by the Chinese government, and mainly worked on project of Culture of Peace for Africa. She also had experience of working in Chinese National Commission for UNESCO, in the Ministry of Education, for the project of education. BI Xiaohan graduated from School of Social Science in Tsinghua University.

**LI Xue**

Programme Officer, Africa Programme Office, UNESCO-ICHEI

Ms LI Xue has been working with UNESCO since 2015, first joining UNESCO Cluster Office to the Democratic People's Republic of Korea (DPRK), Japan, Mongolia, the People's Republic of China and the Republic of Korea (ROK) in Beijing, then moved to UNESCO Regional Office for Eastern Africa in Nairobi, both with Communication and Information sector. Since October 2016, she has been working with UNESCO-ICHEI in Shenzhen, China. She has facilitated projects in ICT in education, digital literacy, open digital library, etc. She received Bachelor of Economics from Renmin University of China and Master of Literature from Capital Normal University. Before joining UNESCO she worked as journalist for NorSensus Media & Syndication in Norway.



SONG Hang

Programme Officer, Africa Programme Office, UNESCO-ICHEI

Dr. Hang SONG joined UNESCO-ICHEI in December 2016 and is currently a programme officer of Africa Programme Office. He achieved his PhD from Brunel University London (England) in June 2016 and his research was focused on Piezoelectric Electrospun polyvinylidene fluoride (PVDF) nanocomposites for energy harvesting applications. During his PhD he gave seminars on mechanics and materials to Bachelor of Engineering (BEng) students, co-supervised and technically supported BEng final year projects and marked BEng assignments and examination papers. He also completed Graduate Learning and Teaching Program of Brunel University London, Scanning Electron Microscope (SEM) training course of Experimental Techniques Centre (ETC) and In-sessional Academic English Program. Dr. SONG played a role of leader of an American-China team of 12 members for Educational Outreach in deprived rural area of Shaanxi Province (China) in July 2011.



ZHU Kejin

PhD student of the joint program between HKU and SUSTech

ZHU Kejin is a PhD student of the joint program between the University of Hong Kong and Southern University of Science and Technology. Her research interest mainly focuses on comparative higher education between China and Africa. Currently, she is actively engaged in UNESCO-ICHEI's "ICT in Higher Education" projects in Africa. Prior to being admitted into the doctoral program, she received her M.S.Ed in educational linguistics from the University of Pennsylvania and accumulated relevant teaching experiences in both American and Chinese universities.

2.5 Partners



Southern University of Science and Technology



Southern University of Science and Technology (SUSTech) is a public university founded in the Shenzhen Special Economic Zone of China. It launched with a mission to reform higher education in China. Since then, it has been widely regarded as a pioneer and innovator in collectively moving China's higher education forward, and is committed to the construction of innovative country and innovative city of Shenzhen. Since its foundation, SUSTech has been carrying forward the spirit of "Dare to Try, Seeking Truth, Pursuing Innovation, and Striving for Excellence", focusing on the school-running characteristics of "Research, Innovation and Entrepreneurship". In the next five years, under a visionary leadership and with an outstanding faculty trained around the world, SUSTech is determined to fulfill its goal of building a world-class institution of higher education and cutting-edge research with broad societal impacts, contributing to the advancement of science and technology in an increasingly global economy.



Weidong Cloud Education Group

Established in 2012, Qingdao, currently Weidong Cloud Education Group has branches in 12 countries worldwide. Weidong Cloud Education owns



International Cloud Education Industrial Park and International Research Institute of ICT-Based Education. Weidong merged Demos international vocational education group and Brest Business School. We focus on building an Internet-based educational ecosystem, and aim to currently provide high-quality resources, products, and services for basic education and vocational education for the global education market. Weidong Cloud Education is the strategic partner of UNESCO, providing international digital education resource sharing platforms for its 195-member countries and regions. Weidong has helped UNESCO hold International Conference on ICT for the second consecutive year. Meanwhile, Weidong has many identities and responsibilities, such as the executive chairman unit of the International Internet Education Alliance (IIEA), the executive director unit of the International Universities Innovation Alliance (IUIA), the member of the leading group of Center for Public-Private Partnership of Tsinghua University (TUPPP), etc. Weidong has been actively carrying out international exchanges and cooperation programs and begins to explore and establish new cooperation modes with the governments of other countries and regions worldwide.



Huawei Technologies Co., Ltd.

Huawei is a leading global information and communications technology (ICT) solutions provider. Driven by a commitment to sound operations, ongoing



innovation, and open collaboration, we have established a competitive ICT portfolio of end-to-end solutions in telecom and enterprise networks, devices, and cloud technology and services. Our ICT solutions, products, and services are used in more than 170 countries and regions, serving over one-third of the world's population. With 180,000 employees, Huawei is committed to enabling the future information society, and building a Better-Connected World. The rise of Huawei in Sub-Saharan Africa has its humble beginnings in 1998 when Huawei established operations in Kenya on the basis of its reputation as a “preferred low-cost, yet high-quality mobile network builder”. In the 19 years since its entry into the region, Huawei now conducts activities in over 40 countries across Africa and is among the top three telecommunications companies with operations in the region.



Shenzhen Metro Group Co., Ltd.

Shenzhen Metro Group Co., Ltd., founded on July 31, 1998, is a large-scale sole proprietorship SOE under the direct control of the State-owned Assets Supervision and Administration Commission of the People's Government of Shenzhen, and the leader in the construction and operation of rail transit of the city, with main businesses covering metro engineering construction, metro operation, investment and financing, resources operation and



property management, engineering investigation and design, etc., formed a quaternity industrial chain of metro "investment and financing, construction, operation, resources operation and property development".

In recent years, Shenzhen Metro Group Co., Ltd. achieved abundant business fruits from various sectors: construction and investment ranking top in Shenzhen fixed asset investment, operation of go-abroad winning project in Ethiopia, continuous promotion of metro and property market brands, breakthrough in general contracting of municipal design, prosperous operation in the underground space along metro lines in the respect of resources, customer satisfaction in property management of over 96%, and running big and strong of metro industrial chain. At the same time, Shenzhen Metro Group Co., Ltd. has been successively awarded over 90 national and municipal patents and prizes, 10 national prizes including Zhan Tianyou Award and Lu Ban Award, 11 provincial prizes including S&T Innovation Achievement, and over 20 municipal prizes including S&T Progress; the corporate technological innovation, brand advantages, and other soft powers are increasing each year.



Xuetangx.com

XuetangX was found by MOOC-CN Information Technology(Beijing)CO,Ltd and the MOE Research Center for Online Education. XuetangX offers



interactive MOOCs (Massive Open Online Courses) from the world's best universities, colleges and organizations. Courses from Tsinghua, Fudan, MITx, HarvardX and many other universities can be taken here for free. We aim to provide the advance systematic educations to the public and offering the opportunity for every single Chinese to enjoy the best educations that are available around world. Through our institutional partner, Tsinghua MOE Research Center for Online Education, along with other leading global universities, we present the best of higher education online and committed to improve the topic diversity. XuetangX is the world's first Chinese Massive Open Online Courses (MOOC) Company founded in 2013 by Tsinghua University, it is also the platform for research and application of China Ministry of Education Online Education Center. Participants of the seminar visited XuetangX and learnt the whole process of making and maintaining MOOC platform.



Beijing Normal University

Beijing Normal University, a key university under the administration of the Ministry of Education, is a renowned institution of higher education known for teacher education, education science and basic learning in both the



arts and the sciences. Among the national key universities built during the time of China's Seventh and Eighth Five-Year Plans, Beijing Normal University is acknowledged as one of the nation's first ten key universities. The school entered into the first "211 Project" Construction Program during the time of the Ninth Five-Year Plan. On the occasion of the 2002 Centennial Celebration, the Ministry of Education and Beijing Municipality said they attached great importance to collaboration in the development of Beijing Normal University. The Ninth Congress of the Communist Party of China in Beijing listed Beijing Normal University as among the institutions it was supporting to become world-class universities. Over the Tenth Five-Year Plan period, the university was listed on the nation's "985 Project" Construction program.



Tsinghua University

Tsinghua University was established in 1911, originally under the name "Tsinghua Xuetang". The school was renamed "Tsinghua School" in 1912. The university section was founded in 1925. The name "National Tsinghua University" was adopted in 1928. After the founding of the People's Republic of China, the University was molded into a polytechnic institute



focusing on engineering in the nationwide restructuring of universities and colleges undertaken in 1952. In November 1952, Mr. Jiang Nanxiang became the President of the University. He made significant contributions in leading Tsinghua to become the national center for training engineers and scientists with both professional proficiency and personal integrity. At present, the university has 20 schools and 57 departments with faculties in science, engineering, humanities, law, medicine, history, philosophy, economics, management, education and art. As one of China's most renowned universities, Tsinghua has become an important institution for fostering talent and scientific research.



South China Normal University

South China Normal University boasts a long history, which can be traced back to the former Teachers' College of Xiangqin University founded in August 1933. In 1996 SCUN entered the national key universities of "211 Project" ranks, the University of Guangdong province people's government and the Ministry of education and the ranks of high-level university of Guangdong Province overall construction in 2015 also the national "world first-class discipline construction ranks in 2017.



Guangzhou CreateView Optoelectronics Technology Co.,Ltd.



Guangzhou CreateView Opto-electronics display Technology Co., Ltd, adheres to the "innovation, deepen the application of fusion" concept, with wisdom education cloud service platform, focus on R & D and manufacturing industry: education teaching intelligent terminal product development, all kinds of teaching application software system, to carry out the planning and

design of regional education and teacher training service the operating data, value-added services, providing comprehensive solutions of wisdom education for the education sector, to provide business service platform for enterprises, construction of wisdom education ecosystem, become the leading Chinese wisdom education service operators.



Shenzhen AEE Technology Co., Ltd.



AEE Shenzhen electric Aviation Technology Co. Ltd. as a leading manufacturer of unmanned aircraft equipment level, is committed to the development of the whole industry chain to unmanned aircraft products as the core, R & D and production of machine supporting industrial products without focus on equipment, equipment level of UAV manned rotorcraft and intelligent camera, high-end carbon fiber products, AEE only in the original General Armament Department "unmanned aircraft system" military standard drafting enterprises, only to participate in the Ministry of public security police "unmanned aircraft system" industry standard drafting enterprise, the first access to the Ministry of public security police "unmanned machine system" national standard of qualified products, participate in the formulation of the "Shenzhen municipal government (2013 -2020) the drafting of aerospace planning the outline of the government planning outline" in the industry, and the editor of four UAV national

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standards, written seven UAV industry standard With the national level two, military secret units, the national military weapons and equipment manufacturing qualification, national military standard quality system certification, PCT international patent invention, the more than 600 patents, AEE products are widely used in military, police and civilian industries, four major areas, providing products as a whole global industry and wisdom safe city the construction of solutions.



Artron

Artron Art Center (Shenzhen)



Artron Art Group (Artron), a comprehensive cultural industry group founded in 1993, is committed to inheriting, enhancing and spreading art value. Based on abundant art data, Artron provides art industry and art fans with professional service and experience of quality products by integrated application of IT, advanced digital science and innovative crafts and materials. Artron has initiated an innovative business model with art data as its core, IT as its means and coverage of full art chain with an aim to building products, service and experiences for the chain. Integrating those resources, technologies and experiences of Artron Art Group specializing in the art

circle over two decades, and upon big data, cloud computing and other leading technologies, Artron Data provides art agencies and artists with fully integrated services including data acquisition, processing, management and application with China Artwork Database as its core.



Sunrise Art Center, Shenzhen, China



Founded in 2006, Sunrise Art Center is located in the far end of Dafen Village. The founder of Sunrise, has ingeniously integrated traditional Chinese architectural art into the space. The classical Chinese architecture presents you the glamor of history, while the modern facilities of exhibition hall, multi-function hall and conference hall provide artists and scholars with a place for exhibition, academic research and communication.



Chapter 3

Report of ICT Application in Higher Education

- 3.1 Botswana
- 3.2 Cameroon
- 3.3 Djibouti
- 3.4 Egypt
- 3.5 Ethiopia
- 3.6 Ghana
- 3.7 Malawi

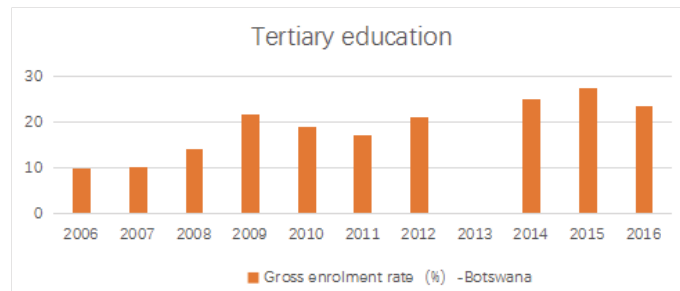
During the training, the participants are encouraged to form group by nation or institution and deeply comprehend the necessity, objectives and implications of ICT capacity building in their country or institution. Then design the planning scheme for development of ICT in their country or institution. Policy developers and administrators, educators, and technicians will be responsible for policy, teaching and learning, and infrastructure sectors respectively. On the last day of the training session, each country presented in front the group for sharing. Here are the planning schemes for development of ICT from the 7 participating countries:

3.1 Botswana

3.1.1 Higher education in Botswana



Botswana made great strides in educational development after independence in 1966. At that time there were very few graduates in the country and very few Botswana attended secondary school. With the discovery of diamonds just after independence and the increase in government revenue that this brought, there was a huge increase in educational provision in the country. The University of Botswana, Botho University, Limkokwing University of Creative Technology, Botswana International University of Science and Technology are the institutions that offer university education in the country. The University of Botswana is the national university which was established in 1982 by act of parliament and is headquartered at Gaborone. The gross enrolment ratio has increased from 10% in 2006 to 23.43% in 2016.



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3.1.2 National Information & Communications Technology Policy - “Maitlamo”

The Ministry of Communications, Science and Technology (MCST) was set up with a mandate to turn Botswana into an information and knowledge based economy. The ministry’s mission is to promote the wider use of relevant information and communications technologies (ICT), and formulate science and research policies, whilst coordinating their implementation.

At MCST the benefits of progressive ICT use in national development is recognized and we believe that it could be used to a greater extent in meeting Botswana’s economic diversification plans. With this view, a National Information & Communications Technology Policy, “Maitlamo” was drafted in 2005 and a legislative framework that would support this policy is identified.

The National Assembly approved the National ICT Policy in August 2007. The Policy serves to provide Botswana with a clear and compelling roadmap that will drive the social, economic, cultural and political transformation. The Policy complements and builds upon the Vision 2016 platform. It provides key strategies essential for achieving Botswana’s national development targets within the scope of ICT development including possible routes to implementation. Maitlamo also provides application recommendations across varied ICT areas in Government services, and the private sector.

In addition, the policy addresses the subject of community access to ICT, which is critical to the success of any implementation effort. It affects the economic growth of the sector, infrastructure development, ICT related security and promotes the creation of relevant legislation.

It is believed this Policy will enable the country to secure a key regional position in the emerging global information society by creating an enabling environment for the growth of a sustainable ICT industry.

3.2 Cameroon

3.2.1 Higher education in Cameroon



©PAMAPS, University of Yaounde I

Cameroon is one of Central African young states that fought fiercely to achieve its independence in 1960 after being colonized by France and Britain. These historical data explain the linguistic heritage of Cameroon which has two official languages, namely English and French. Cameroon is also one of the only countries that has two educational systems operating simultaneously: one that is based on its British/Anglophone colonial past and one on its French/Francophone colonial past.

Cameroon is a member of the United Nations Organization. It has ratified most of the international treaties. The country is counting on the virtues and strengths of knowledge and intelligence to boost its economic and social development. This is the reason why the university has a pride of place in the country.

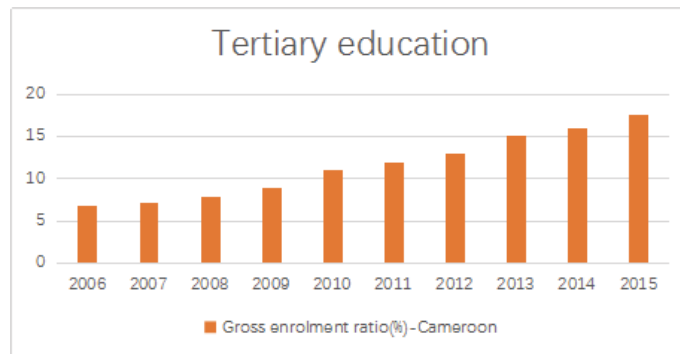
Admission to higher education requires a Baccalauréat de l'Enseignement Secondaire, Baccalauréat Technique, four passes on the General Certificate of Education Ordinary Level or two passes on the General Certificate of Education Advanced Level. Universities are either Francophone or Anglophone, or offer programs in both languages.

Anglophone university education closely mirrors British higher education.

Admission requires sufficient passes on the General Certificate of Certificate of Education Advanced Level. Undergraduate programs leading to a bachelor’s degree consist of three years of study. Graduate studies include a one-year Postgraduate Diploma and master’s programs that are one to two years. All graduate programs require a bachelor’s degree for admission. Doctoral programs are three years and require a master’s degree for admission.

Francophone higher education is virtually the same as higher education in France, including the adoption of the L-M-D (licence-master-doctorat) system that France implemented in response to the Bologna Declaration.

The gross enrolment ratio of tertiary education has increased from 6.76% in 2006 to 17.48% in 2015.



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3.2.2 Cameroon’s University Map

Cameroonian Ministry of Higher Education (MINESUP) is in charge of implementing and developing government policies and programmes in higher education. It studies and advises the government on ways to adapt the higher education system to national social and economic realities; particularly on the appropriateness of higher education in regards to the needs of the national economy.

Cameroon’s university map has gradually been consolidated. In 1961, the Higher Teachers’ Training College, the first university institution in the country was created. The landscape has evolved and today there are eight (8) state-owned universities and 215 Private institutions of Higher Education (PIHEs) for a student population of about 500,000.

The growing increase in students' enrolment results in an imbalance in the teacher-student ratio. About 100,000 new students knock at the doors of higher education every year. This is the background that decided the President of the Republic to launch the "Cameroon E-National Higher Education Network".

3.2.3 "Cameroon E-National Higher Education Network :ONE STUDENT, ONE COMPUTER"

This project is a commitment by the President of the Republic, His Excellency Paul BIYA, to boost the leap towards distance education in Cameroon through the slogan : "one student, one computer".

It aims at donating for free a laptop computer connected to the internet to students from a public or private institution. Prof. Jacques FAME NDONGO is the project manager, under the supervision of the Prime Minister Head of Government, His Excellency Philemon YANG.

It has been designed to donate 500,000 computers to Cameroonian students registered through a biometric process, be they from public or private university institution.

In addition to the donation of laptop computers, the "Cameroon E-National Higher Education Network" project provides for the construction of ten (10) University digital development centres (UDDCs), one per state university, one centre for the Cameroon-Congo inter-states university in Sangmelima, and another centre for the coordination of the entire network.

Lastly, the project provides for the extension of the connection speed in universities which is expected to move from the current capacity of 1 gigabit to 12 gigabits per second for all universities.

Cameroon's Government relies on the success of this project to freely donate computers to students and definitely embark the Cameroonian University on an ambitious distance education programme which would include Massive Open Online Courses (MOOCs), E-Learning, E-Commerce, online Interactive Course, Online library, Online data, e. assessment,

Synchronous learning, Virtual labs, e. Humanities, etc.

3.2.4 The Project Management and Status

The “Cameroon E-National Higher Education Network” project which dates back to June 2015 with the signing in Beijing of a Framework economic and cultural cooperation agreement between the Republic of Cameroon and the People’s Republic of China is backed by a cooperation loan with EXIMBANK of China.

The 500,000 computers are currently being manufactured here at Shenzhen by the Sichuan Telecom Construction Engineering Co. Ltd. The first computers are expected in Cameroon in December this year.

3.2. 5 International Reaction on the Project: FR UNESCO, AUF

On 4th August 2016, UNESCO commended the Government of Cameroon for the initiative of the country’s President to donate 500,000 computers to students from public and private universities and embark the country’s University on an ambitious modernization project.

On 10th August 2016, the Agence Universitaire de la Francophonie - AUF- (the Francophonie University Agency) expressed its satisfaction to the Government of Cameroon on the strategic decision by the President of the Republic to donate 500,000 computers to Cameroonian students.

According to the AUF, this is a strong sovereign decision which aims at aligning the Cameroonian youth with the digital economy.

3.3 Djibouti

3.3.1 Higher education in Djibouti



©University of Djibouti

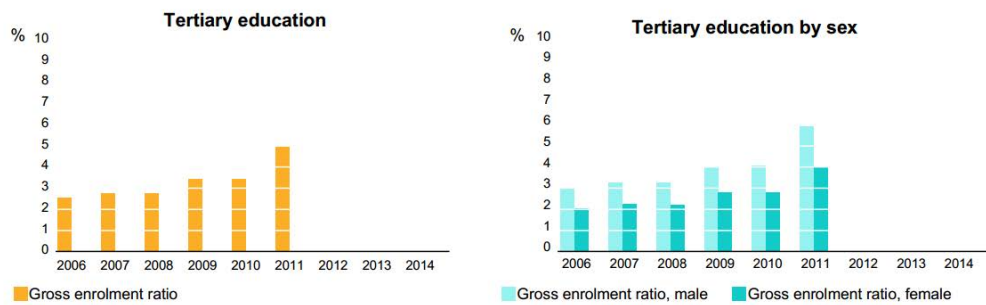
The education system of Djibouti is strongly influenced by France. Institutions of higher learning in the country include the University of Djibouti. According to Ministry of Education's Strategic Document for Higher Education and Research 2015-2019, Djibouti is facing following challenges in higher education.

The Challenge of Quantity

Pressures on the education system will intensify because of steady demographic growth. According to UNESCO Institute for Statistics the gross enrolment ratio increases from 2.55% in 2006 to 4.99% in 2011. More than 8000 students enrolled in higher education for the 2014-2015, a number that is constantly increasing.

The university campus was designed for 10,000 university students. In 2017, 9548 students were enrolled into University of Djibouti reaching the limit of its capacity. There is an expressed wish to facilitate the realization of a second campus of a comparable size that will add to the existing capacity and, before the end of the decade, assist in offering a more holistic framework for welcoming students. Elsewhere, in order to improve the conditions of students living far from campus, a university restaurant and

bus system will be put in place.



Tertiary education	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Gross enrolment ratio (%)										
Total	2.55	2.76	2.76	3.44	3.44	4.99
Female	2.06	2.25	2.22	2.82	2.81	4.02
Male	3.04	3.26	3.28	4.04	4.07	5.94

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The Challenge of Quality

The quality challenge is that of responding accurately to the needs of the growing national economy in order to insure employment to an increasing amount of graduates as well as supplying skills that will enable graduates to create jobs in the future (rather than only taking jobs). This managerial culture is expected to make the engineering students the engine of the economy by taking advantage of the different opportunities of macro-level development projects (new roads, railroads, ports, etc.) as well as the future development of geothermal, wind, and solar energy in order to contribute to the betterment of the Republic of Djibouti.

It is in this way that the University of Djibouti is pushing itself more and more towards the establishment of high level areas of study that are accessible through examinations.

Finally, given the geopolitical context, a bilingual, or better yet a trilingual environment must become the golden rule enforced at the University of Djibouti in order to ensure the excellence of its programs.

This would take place over the 2015-2019 period in the following form

- 1- Support for the **Faculty of Engineering** (supplying necessary

- equipment) *Opened in 2013*
- 2- Establishment of a **Faculty of Business** *Expected in 2015/16*
- 3- Establishment of a **Faculty of Architecture** *Expected in 2015/16*
- 4- Establishment of an **Entrepreneurship Center** at the University of Djibouti
- 5- Establishment of a **University Centre of Language Education**

These establishments, starting with the current Faculty of Engineering, will function in direct partnership with renowned foreign universities in order to ensure quality pedagogy as well as the possibility of further or complementary student in these same universities for our best graduates (with a scholarship).

National Research as an Engine for Development

The national applied research has, for many years, been the engine for economic development in the country. Two examples remind us of this, that of numerous geophysical studies that determined the precise characteristics of our geothermal deposits and, in light of an identified resource both exploitable and profitable, the interest of industries. A second example of this is the case of wind-power, which permitted the launching of the desalination of seawater project in Doraleh and was completely powered by wind-power.

3.3.2 University of Djibouti

The history of University of Djibouti went back to 1990:

- ◆ 1990: creation of B.T.S in Public School of Djibouti -First advanced training
- ◆ 2001: creation of Pole University of Djibouti
 - ※ Supported by strong governmental will
 - ※ coming from the general situation of education in 1999
 - ※ based on a distance education system with local tutor

Report of ICT Application in Higher Education

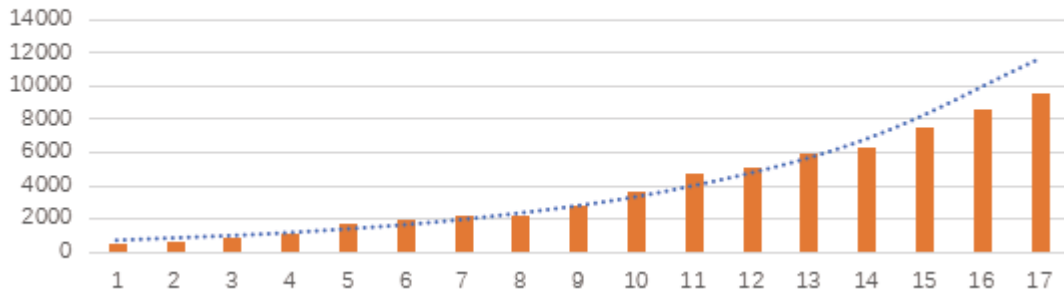
- ◆ 2006: creation of University of Djibouti in full operation
 - ✧ Question of the quality of Djibouti teachers
 - ✧ Adoption of LMD system (Bachelor, Master, Doctor)

By now, the university has 7 faculties: Faculty of Law, Economy and Management, Faculty of Literature, Languages and Social Sciences, Faculty of Science, University Institute of Technology, University Institute of Industrial Technology, Faculty of Engineering and Faculty of Medicine.

The number of students have increased greatly from 461 in 2001 to 9548 in 2017.

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009
Students	461	659	886	1146	1698	1945	2166	2246	2800
Difference		198	227	260	552	247	221	80	554
Evolution		43%	34%	29%	48%	15%	11%	4%	25%
Year	2010	2011	2012	2013	2014	2015	2016	2017	
Students	3650	4723	5080	5893	6348	7481	8614	9548	
Difference	850	1073	357	813	455	1133	1133	934	
Evolution	30%	29%	8%	16%	8%	18%	15%	11%	

Evolution of total numbers



eCampus Project

University of Djibouti uses eCampus as a Platform of Management for students' whole university life cycle. Built on a unique and common database, it operates the whole process for the management of students, including registration, input of credits, planning of examinations, printing of certificates, etc.

◆ Advantages of eCampus

For administration: permitted to manage on the same platform

- » the university courses
- » course planning

For faculties : permitted to conduct direct on line management

- » teaching and examinations
- » students communication/events

For students : permitted to have direct on-line access

- » students document
- » course planning and examination results

◆ Major ambitions for eCampus

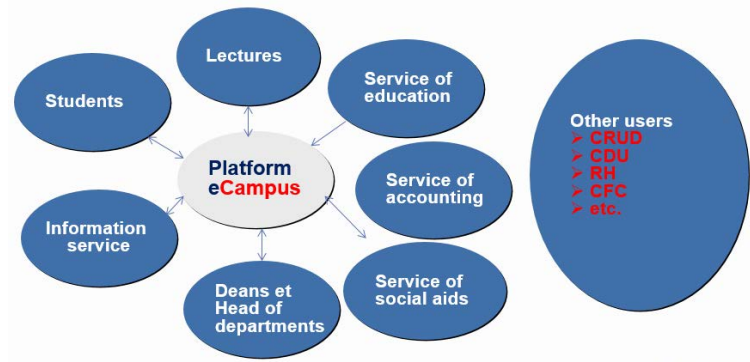
- » From registration to the delivery of certificates
- » Integration of new tools and university management: Human Resources, Finance, Logistics, etc.
- » The production of each member of university community: Students, Lecturers, Administration, Technical support, etc.

◆ Major qualities of eCampus

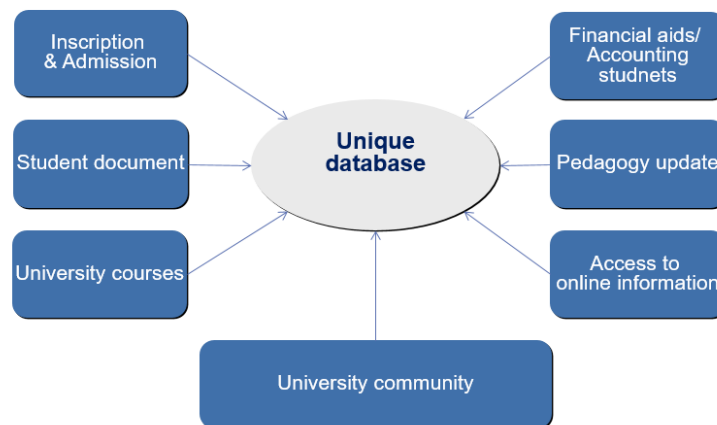
- » The flexibility and rigor in organization
- » Being active and full of anticipation
- » Utilization of computers as privileged working tools
- » The autonomy and job sharing
- » Self-education and continued personal development

◆ Major functions of eCampus

- » Process of pre-registration
- » Students' space
- » Process of pedagogic registration
- » Lecturers' space
- » Consultation of credits



Users of eCampus



Implementation Modules of eCampus

Plan for University of Djibouti

- ◆ 2016-2017 : 50 teachers trained on the utilization of Moodle
- ◆ 2017-2018 : Put in place a smart classroom and an expert team
- ◆ 2017-2018 : Proposed subjects for teaching in the form of eLearning
 - » Written and oral communication
 - » Preparation for employment
- ◆ 2019-2020: Proposed professional models for teaching in the form of eLearning
 - » Logistics & Transport
 - » Accountability & Finance
- ◆ 2019-2020 : Proposed qualified training on eLearning

- » Académie CISCO
- » Académie ORACLE

3.4 Egypt

3.4.1 Egypt Higher Education

General responsibility for education in Egypt is divided between the Ministry of Education and the Ministry of Higher Education. The Ministry of Education



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oversees preschool, primary, preparatory and secondary education, while the Ministry of Higher Education oversees postsecondary education. The Supreme Council of Universities sets overall policy and supervises the establishment of new institutions.

The Ministry of Higher Education supervises the tertiary level of education. There are a number of universities catering to students in diverse fields. At the tertiary level, there were a total of 2,646,000 students enrolled across all levels in 2010, with 19 percent of those enrolled in a private institution and 51 percent female. The gross enrollment ratio at the tertiary level was 32 percent in 2010, above the regional average of 24 percent for Arab States and also above the world average of 29 percent.

In an article of Nick Clark in World Education News & Reviews, Egypt's youth are calling for a reform of the tertiary system such that it would better meet the needs of the labor market and produce employable graduates in an economic environment where opportunities have stalled and jobs have become increasingly hard to come by. For the 21.3 million Egyptians aged 15 to 29, the unemployment rate stood at a dizzying 77.5 percent in 2012, while the overall unemployment rate rose to 12.6 percent according to statistics from CAPMAS, the state statistics agency.

Degree Programs of Egypt

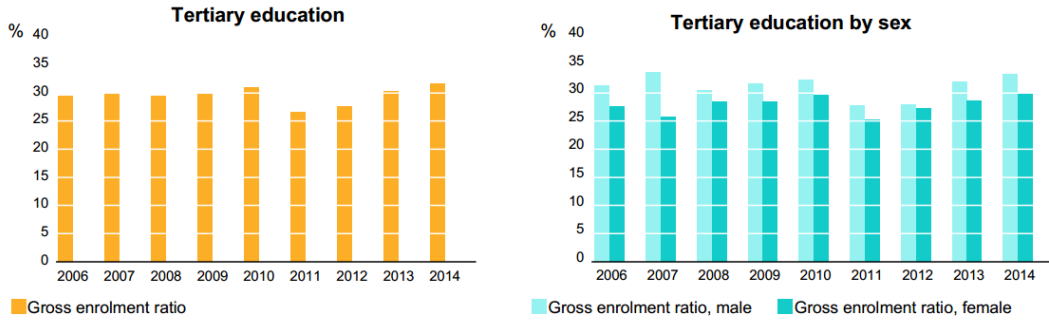
Egypt is known to have the best and the largest education system in the Middle east and North Africa and it is still growing at the fast pace since 1990. The Government of Egypt is also taking various promotional measures to improve the education system in the country. For this purpose, they are hiring teachers on merit basis to improve the standard of education for the children.

Education System

Presently the following system of Education is being followed in Egypt. It is fundamentally divided into 2 stages:

1. School Education (Pre Higher Education): Ministry of Education holds an authority on this stage.
2. Higher Education: Ministry of Higher education holds an authority on this stage.

As far as higher education is concerned, the same is provided by public and private universities in Egypt which are providing their students both professional and technical training. Ministry of Higher education and scientific research takes responsibility of these universities. All the operations of the universities including administration, degree courses are determined by laws and government regulations. University of Cairo and Alexandria also provide facility of open college education. Private Universities in Egypt can set their own criteria regarding courses and fees without any intervention from the Ministry. The gross enrolment ratio has increased from 29.43% in 2006 to 31.68% in 2014.



Tertiary education	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Gross enrolment ratio (%)										
Total	29.43	29.71	29.4	29.95	30.9	26.52	27.62	30.32	31.68	...
Female	27.5	25.65	28.36	28.32	29.52	25.24	27.24	28.59	29.92	...
Male	31.26	33.6	30.39	31.51	32.22	27.74	27.98	31.97	33.37	...

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3.4.2 Egypt 2030 Vision

Egypt has casted a complete version for where it sees itself in 2030. Its main focus is sustainability. The plan has multiple axes but ICT is an enabler for all axes from health to education to resource efficiency. This justifies the investments allocated and the vested interest in modernizing the ICT infrastructure.

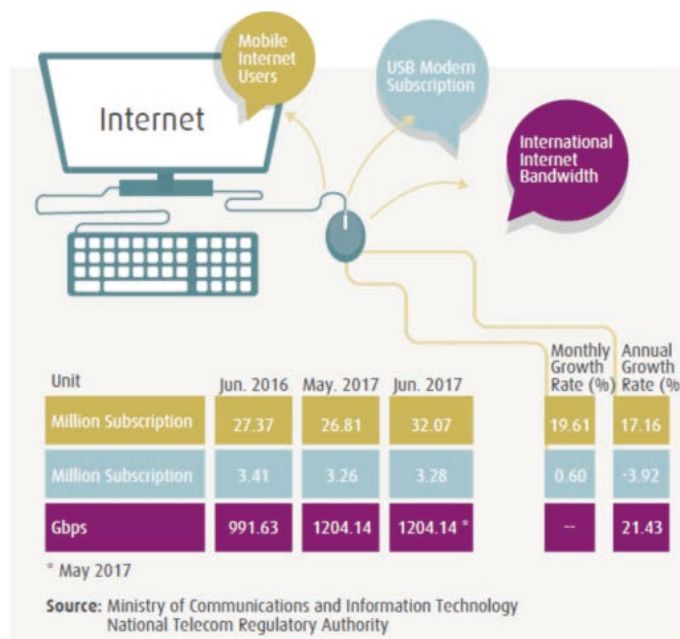
A full description of Egypt 2030 vision can be found through the following link <http://www.cabinet.gov.eg/English/GovernmentStrategy/Pages/Egypt%E2%80%99sVision2030.aspx>

3.4.3 Existing ICT Policy in Egypt

Egypt has started moving towards ICT in 1992 when it launched a major program to train university graduates to become world class programmers. This came with the re-organization of the ministry of communications and transport to become the ministry of communications and information technology (MCIT). MCIT took over the transformation of the Egyptian economy to be ready for the digital age. They expanded their program from software programming to include electronic design, embedded systems and mechatronics. The country has invested a portion of its revenues off air licensing to foster this transformation.

Initiatives

- ◆ Lowering internet access pricing
- ◆ Raising bandwidth
- ◆ Allowing mobile internet
- ◆ Liberating the telecom market
- ◆ Expand training opportunities as well as creating faculties of information technology in many universities in addition to normal computer and software engineering graduates
- ◆ Significantly upgrade ICT infrastructure
- ◆ Creation of the information technology authority. ITIDA
- ◆ Creation of ICT startup funding mechanisms
- ◆ E-Government initiative
- ◆ Creating the Egyptian Knowledge Bank (EKB)
- ◆ Support Small and Medium Enterprises in ICT sector

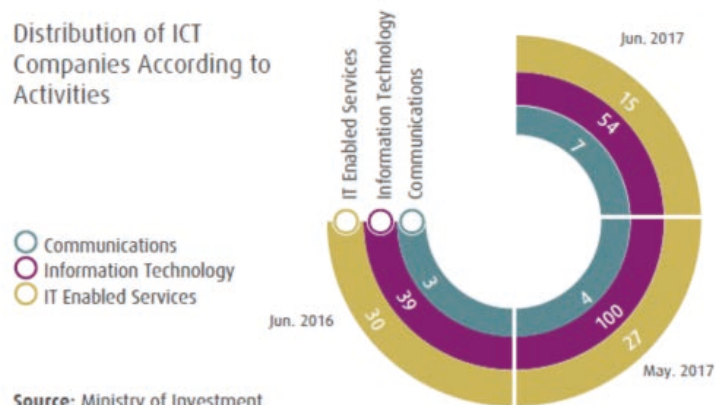


Mobile Subscription		Mobile Penetration	
Million Subscription		%	
96.22	Jun. 2016	108.94	
100.42	May. 2017	111.85	
100.31	Jun. 2017	111.56	
-0.11	Monthly Growth Rate (%)	-0.29	
4.24	Annual Growth Rate (%)	2.62	

Source: Ministry of Communications and Information Technology
National Telecom Regulatory Authority

Unit		Jun. 2016	May. 2017	Jun. 2017
Issued Capital of Newly Established ICT Companies	Million EGP			
	Communications	1.21	0.36	0.36
	Information Technology	12.90	19.64	15.12
	IT Enabled Services	8.36	156.60	7.35
Total		22.47	176.60	22.82
Number of Newly Established ICT Companies	Companies			
	Communications	3	4	7
	Information Technology	39	100	54
	IT Enabled Services	30	27	15
Total		72	131	76

Distribution of ICT Companies According to Activities



Source: Ministry of Investment
General Authority for Free Zones and Investment

3.4.4 Objectives

- ◆ Build knowledge-centric society
- ◆ Increase youth employability.
- ◆ Improve citizen's quality of life
- ◆ Improve resource utilization

◆ Improve service efficiency

Telecommunications and ICT are pivotal in Egypt's development plans in the past two decades and Egypt's 2030 vision outlined by the Egyptian president.

Four of the important initiatives in the education sector are:

- » Virtual Labs;
- » Thinking in 3D;
- » Drama Based Learning;
- » Interactive e-Book

For the health sector, ICT projects completed are:

- » IT Health Master Plan;
- » National Healthcare Capacity Building Project;
- » Women's Health Outreach Program;
- » Health Insurance Student Hospital Development - Abou El Reish;
- » Updating Alexandria Regional Centre for Women's Health & Development;
- » Information System Unit in Public Hospitals;
- » Digital Medical Files (Family Health Units);
- » Suez Insurance Hospital Development;
- » Human Resources Training at Health Ministry;
- » National Project for Integrated system of X-ray Transfer

Other aspects of the ICT policy in Egypt include e-government, e-content, Green ICT and ICT for legislative services.

3.4.5 ICT in Ain Shams University

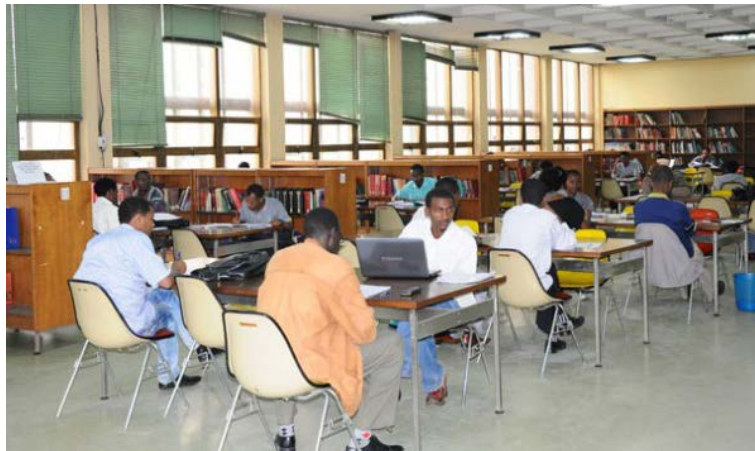
Given the vast size of ASU into 19 faculties with close to 250,000 students. Faculty and staff members, ASU recognizes the importance of ICT in its operation. There are different venues moving at different paces. ICT is

recognized as the pivot for modernizing ASU going into the future. Some of the steps taken and on-going are:

- ◆ Automating student information system (SIS) in multiple faculties and working on the rest
- ◆ Disseminating Learning Management Systems (LMS) in multiple faculties
- ◆ Creating a central portal for the entire university with modules for managing faculty affairs, campus services, and asset management.
- ◆ Enhancing the use of computing facilities and servers in and intra-faculties
- ◆ Enhancing IT services
- ◆ Library modernization
- ◆ Built a VR lab within the faculty of engineering
- ◆ Encouraged professors to build e-content for their courses by paying monetary incentives as well as provide support by building the content for the professor even starting from paper-based lecture notes
- ◆ Spread basic digital technology in class rooms and lecture halls from computers to data-show projectors.

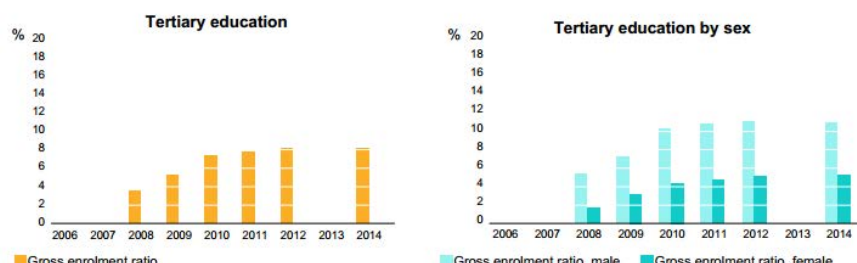
3.5 Ethiopia

3.5.1 Higher Education in Ethiopia



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The introduction of higher education in Ethiopia began in the mid-1960s. It is only in that past fifteen years, access to higher education has opened to the wider population. According to Ministry of Education, in 2004/05, the number of public higher education institutions has increased, from 8 to 36 (33 take students directly from grade twelve), distributed across all regions of the country. Private higher education institutions have also expanded, reaching 98 institutions in total, accommodating around 15% of all student enrolment by the end of the Education Sector Development Program IV period. This extra capacity has allowed rapid increases in intake. Undergraduate enrolment (government and private) rose from 447,693 in 2010/11, to 593,571 in 2013/14. According to UNESCO UIS, the gross enrolment ratio of Tertiary education has been increased from 3.54% in 2008 to 8.13% in 2014.



Tertiary education	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Gross enrolment ratio (%)										
Total	3.54	5.25	7.33	7.76	8.14	...	8.13	...
Female	1.68	3.22	4.41	4.71	5.16	...	5.27	...
Male	5.39	7.27	10.24	10.78	11.1	...	10.94	...

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3.5.2 Existing ICT Policy in Ethiopia

Considering ICT as a vital tool for development, the Ethiopian Government proclaimed National ICT Policy and Strategy in August 2009. The Government has made the development of ICT one of its strategic priorities.

- ◆ The Government is committed to accelerate the development of ICT in order to:
 - ※ strengthen the on-going process of sustainable socioeconomic development and poverty reduction endeavors
 - ※ ensure that all citizens have equal and equitable access to government services and information
- ◆ The objectives of the ICT policy and strategy are as follows:
 - ※ Build ICT Infrastructure throughout the country and make it accessible.
 - ※ Create the necessary skilled human resources required for the proper development and application of ICT and expand the society's basic knowledge and usage of it.
 - ※ Develop the necessary legal framework for the application of ICT and design and implement appropriate security systems for the prevention of unlawful practices.
 - ※ Promote the use of ICT for modernizing the civil and public services to enhance its efficiency and effectiveness for service delivery; so as to promote good governance and reduce wastage of resources.
 - ※ Expand and strengthen the role of the private sector to ensure the rapid development of ICT.

Ethiopia's ICT policy is one of the fundamental components of the country's socioeconomic development goals and objectives. Thus, the focus of the policy will be on the following areas that are considered strategic for the success of ICT development.

- ◆ ICT infrastructure development
- ◆ Human resource development

- ◆ ICT's legal systems and security
- ◆ ICT for governance/E-Government/especially:
 - ※ ICT in the education sector
 - ※ ICT for improved health
 - ※ ICT for agricultural modernization
- ◆ ICT industry and private sector development
- ◆ ICT for research and development

3.5.3 Ethiopia's Growth and Transformation Plan(GTP) I (2010 – 2015)

- ◆ Development Policies and Strategies of the Government are the overall frameworks of the GTP
- ◆ Within these frameworks, the main bases include:
 - ※ Performance of plan for accelerated and sustained development to end poverty (PASED) and lessons drawn during its implementation
 - ※ The country's vision
- ◆ The main agenda of the plan is to sustain broad-based, rapid and equitable economic growth to reduce and ultimately eradicate poverty
- ◆ Implemented in phases
 - ※ GTP I, from 2010 to 2015
 - ※ GTP II, from 2015 to 2020
- ◆ Focus
 - ※ Reachability to education and other services
 - ※ Expand and ensure the qualities of education and health services and achieve MDGs in the social sector
- ◆ Strategic directions
 - ※ Enhance the information communication technology infrastructure

and human development

- ※ Utilize ICT in government administration, industry development and private sector development
- ※ Enhancing expansion and quality of social development
 - Improve access and quality of education & training
 - To strengthen the ongoing efforts in expanding education and ensure quality
 - To exert maximum effort to alleviate problems that limit children's & women's participation in education
- ※ And others...

◆ What has been achieved

- ※ Education (Higher education)
- ※ Undergraduate enrolment in regular programs in both public and private higher education institutions has increased from 207,179 in 2009/10 to by 2014/15
- ※ Enrolment in postgraduate program has increased from 14,272 in 2009/10 to 33,915 by 2014/15
- ※ The share of female students in undergraduate program has increased from 29 percent in 2009/10 to 32 percent by 2014/15
- ※ Share of female students in the postgraduate program reached 19 percent by the end of 2014/15
- ※ 70 percent of undergraduate students were enrolled in Science and Technology program and 40 percent of them were enrolled in engineering and technology program

3.5.4 Ethiopia's GTP II (2015 – 2020)

◆ Focus

- ※ Quality
- ※ Human development and technology capacity building
- ※ Ensure digital infrastructure expansion and its quality

◆ Strategic directions

- ※ Improve educational participation, quality and relevance at all education levels
 - ※ Provide a student friendly environment especially for young women students
 - ※ Guide research system in higher education institutions by the role they play in economic growth and development of the country
 - ※ Accelerate information, communication technology development, human development, ensure the legal framework and security
 - ※ And others...
- ◆ Excerpt of major targets (Human development and technology capacity building)
- ※ Focus on the development of university teachers, and on equipping research, laboratory and workshop facilities to ensure the quality of higher education
 - ※ Improve the quality of education, teacher development program will be strengthened and teacher to student ratio will reach 1:19
 - ※ Increase proportion of qualified teachers in higher education institutions (second and third degree) from 58:15 in 2014/15 to 75:25 by the end of 2019/20
 - ※ Implement one to three thematic areas of excellence per university
 - ※ Ensure quality through results based efforts
 - ※ Revise curricula based on integrated competence-oriented education system
 - ※ Focus training programs on science and technology fields and its quality will be enhanced in efficiency to bring it on par with other similar countries institutions.

3.5.5 Brief Strategic Plan for ICT in HEI in Ethiopia

- ◆ The exclusive inclusion of ICT in HEI's in Ethiopia is the ultimate goal of this strategy.
- ◆ In order to achieve this goal the following activities separately and also in parallel should be done.

- ※ Awareness Creation of the role of ICT in HEI
- ※ Creation of Knowledge Societies
- ※ Creation of OER- and its Accessibility (modularization) - Start from LOOC (or SPOC) with a goal of MOOC
- ※ Knowledge creation and the associated business modeling.

No.	Task Description	Year1	Year2	Year3	Year4	Year5
1	Awareness Creation of the role of ICT in HEI					
2	Creation of Knowledge Societies					
3	Creation of OER - Its accessibility (Modernization)					
4	Knowledge Creation					
5	Business Modeling and Production.					

Awareness Creation of the role of ICT in HEI

- ◆ First thing First - This same workshop has to be repeated in our university
- ◆ Creating a group that will facilitate the awareness creation in the university.
- ◆ Utilizing the OBOR opportunity to train staffs and technicians every year.
- ◆ Work with MoE to propagate the effort county wide.
- ◆ Organize a national workshop
- ◆ Design ways to sustain the awareness creation in the future.
- ◆ Awareness creation is not a one time Job.
 - ※ Periodic workshops
 - ※ Bulletins and pamphlets have to prepared and distributed periodically
 - ※ Using the university radio station for the cause.
- ◆ Technical Staff capacity development to maintain the sustainability of the infrastructure and the OER and knowledge that will be created in the

coming phases.

- ※ A number of opportunities exist to achieve this goal.

Creation of Knowledge Society

◆ Ethiopian Current Status

- ※ Agrarian Economy
- ※ We focuses now on Industrialization (GTP II ((2015 - 2020))

◆ Strategy: Creating Information and Knowledge Society in parallel to Industrialization

- ※ Information Society: Creation, distribution and treatment of information based on the use of ICT. Most significant economic and cultural activities are supported by the technology

- ※ Knowledge Societies:

- Knowledge is acquired, created, disseminated and applied to enhance economic and social development.
- Capabilities not just to acquire information but also to transform it into knowledge and understanding
- The conditions for generating knowledge and processing information have been greatly changed by a technological revolution focused on information processing, knowledge generation, and information technologies

◆ Awareness creation to the public at large

◆ Develop Knowledge Society Policy based on the following principles

- ※ Freedom of expression
- ※ Cultural and linguistic diversity
- ※ Universal access to information and knowledge
- ※ Quality education for all

◆ The Knowledge Society we aspire will be possible through

- ※ The spread of digital technology

- ※ Openness
- ※ Accessibility
- ※ Multi-stakeholder participation
- ◆ Start Creation of Information and Knowledge Society at HEI
- ◆ Indispensable Role of HEI: Create Human Knowledge (students, teachers, researchers, scientists, academic entrepreneurs)

Creation of OER

- ◆ Open Educational Resources (OER)
 - ※ Part of Open Solutions
 - ※ Could be courses, curriculums, test...
- ◆ It is a paradigm shift to Support and encourage instructors to create, revise, and adopt course materials that increase student learning and student access to high quality, innovative learning materials, at lower cost.
- ◆ Issues in OER
 - ※ Commitment from all stakeholders
 - Making sure that stakeholders are buying the idea
 - Also all of them participate
 - ※ Implementation procedures and details
 - ※ Understanding benefits and challenges
- ◆ What is required? Strategic priorities
 - ※ OER policy
 - Adopting UNESCO's template
 - Develop and implement open licensing policies
 - ※ Awareness creation regarding the benefits
 - Citing examples of how the wide public and a person making his/her content open is benefiting
 - Grow and foster communities that support the development and

mainstreaming of OER.

- Better communicate the value of OER to educators, policy makers and other key constituencies
- ✘ Infrastructure development
 - Build key tools that enable more effective development, management, discovery and reuse of OER
- ✘ Content Development
 - Build OER content to fill gaps in key disciplines
 - Provide Incentives for content developers

Knowledge creation and the associated business modeling

◆ The final goal of this whole plan depends on the creation of massive OER in Ethiopia. Once achieved and proved successful, then, learning from the experience of China, knowledge creation and creating the business model to sell the created knowledge will commence so as to insure the sustainability.

◆ The experience of the following companies will be adapted and/or emulated to fit the country's and the region's requirements.

- ✘ Create View
- ✘ Weidong
- ✘ Tsinghua University and the MOOC platform at XuetangX (Beijing)
- ✘ Southern China Norman University
- ✘ Scope
- ✘ And So on

◆ This task will also be made to include all circles of the education sector in addition to HEIs.

3.5.6 The Case of AAU

◆ The ICT Policy of AAU goes in line with the country's policy.

◆ To realize this policy AAU have been doing a lot of activities, some of

which are:

- ※ ICT and Digitalization: important and enabling tool of transformation.
- ※ ICT and digitalization infrastructure, systems and services initiatives at AAU
- ※ Data center modernization
- ※ Core infrastructure: switching, routing and security
- ※ High performance computing (compute, storage, backup and virtualization) at two data centers (main and disaster recovery) is under final phase of deployment
- ※ Library Modernization
- ※ Business Automation

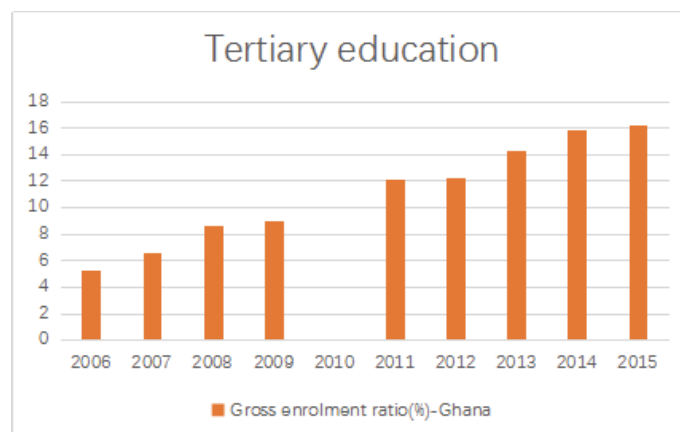
3.6 Ghana

3.6.1 Higher education in Ghana



©Ministry of Education, Ghana

Over the past quarter century, higher education in Ghana has recorded phenomenal increases in the number of institutions and student enrolments, due largely to the deregulation of provision. Ghana’s higher education system has grown from just two institutions and fewer than 3,000 students in 1957 to 133 institutions and approximately 290,000 students in 2013, with most of the expansion occurring from the mid-1990s. The gross enrolment ratio has increased from 0.69% in 1971 to 5.26% in 2006. And in 2015, the gross enrolment reached 16.23%.



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Ghana’s experience illustrates the push factors, policy responses, transformation of higher education, quality challenges of private participation, and deepening of the internationalization of higher education

institutions on the continent. But Ghana as a whole is still bedeviled by the growing pains of a rapidly expanding higher education system that lacks proper funding, as well as a scarcity of jobs for graduates. According to analysis of GOV. UK, a number of bottlenecks remain in Ghana's higher education landscape. Improving existing quality assurance mechanisms and expanding overall access to tertiary education are key challenges. Moreover, funding mechanisms for higher education institutions could provide incentives that foster continuous improvement and innovation. The expansion of higher education in Ghana presents a number of opportunities for improvement. These include further expansion of distance learning, which is already making strong inroads in Ghana, and online learning, which will have a better platform for growth as the country's energy and telecommunications infrastructure strengthens. Growth in graduate numbers is outpacing growth of employment opportunities. To absorb the country's graduates, Ghana must continue to diversify its economy, while higher education institutions must work towards developing curricula that meet the requirements of the labor market.

3.6.2 ICT Policy in Ghana

For a country to progress in its socio-economic development efforts, substantial resources will need to be directed at improving educational delivery through ICT. Over the years, International experience from both developed and developing countries including the site visits from this seminar has shown that technologies have an enormous potential for enhancing knowledge and the development of more efficient education services.

Thus ICT can:

- » Provide multiple avenues for professional development of both pre-service and in-service teachers, especially through distance education
- » Facilitate improved teaching and learning processes
- » Improve teacher knowledge, skills and attitudes and even inquiries
- » Improve educational management processes

- » Improve the consistency and quality of instruction both for formal and non-formal education
- » Increase opportunities for more student centred pedagogical approaches
- » Promote inclusive education by addressing inequalities in gender, language and disability
- » Widen the traditional sources of information and knowledge
- » Foster collaboration and creativity
- » Provide for flexibility of delivery
- » Reach student populations outside traditional education systems

This Policy will thus seek to provide a clear purpose and rationale for how ICTs will be effectively integrated into the Education sector, including identifying opportunities, issues, challenges and strategies that will be employed.

Already there is an existing ICT Policy in Ghana on all levels of education - National ICT for AD Policy - NICT4ADP (Developed in 2003). "To transform the educational system to provide the requisite educational, and training services and environment capable of producing the right types of skills and human resources required for developing and driving Ghana's information and knowledge based economy and society." There is also the existence of the National Information Technology Agency (NITA). Moving forward experiences gained in this seminar should help the team recommend an improvement to enrich the Policy already in place.

Highlights of the policy:

- ◆ Facilitating the deployment, utilization and exploitation within the educational system to improve on educational access and delivery to support teaching and learning across all levels of Education
- ◆ Modernize the educational system to improve the quality of education and training at all levels and to orient all levels of the country's

educational system to the teaching and learning of science and technology

- ◆ To achieve universal basic education (Fcube) and improve the level of basic and computer literacy in the country
- ◆ To ensure a population in which all citizens are at least functionally literate and productive
- ◆ To expand and increase access to secondary and tertiary education
- ◆ To strengthen science education at all levels and in all aspects of the educational system, especially at the basic and secondary levels

3.6.3 Overall ICT goal

The overall ICT goal is to enable graduates from Ghanaian educational institutions - formal and non-formal to confidently and creatively use ICT tools and resources to develop requisite skills and knowledge needed to be active participants in the global knowledge economy.

Expectations:

- ◆ Leadership, political and governmental commitment and support at the highest levels improved.
- ◆ Adequate Funding and active Participation by key stakeholders
- ◆ Continuous coordination and feedback at all stages of implementation.
- ◆ Change in Management at all levels
- ◆ Monitoring and evaluation

3.6.4 Ghana's achievements in ICT

- ◆ Establishment of Education Management Information System (EMIS)

- ◆ Computerized Schools Selection and Placement System (CSSPS) ie. Placement of Students into Senior High School based on raw scores out of Basic Education Certificate Exams (BECE).
- ◆ Distance Education in Ghana - Center for National Distance Learning and Open Schooling (CENDLOS - The Use of ICEBOX)
- ◆ Free Laptops to Teachers and pupils
- ◆ Online admission platform for all public universities
- ◆ Free internet facility for all SHS / Tertiary institutions
- ◆ Putting up ICT labs for all SHS
- ◆ Laying of fiber optic cables across the country (NITA) to enhance the Speed of ICT coverage in Ghana

3.6.5 New ideas gained in the seminar for future development

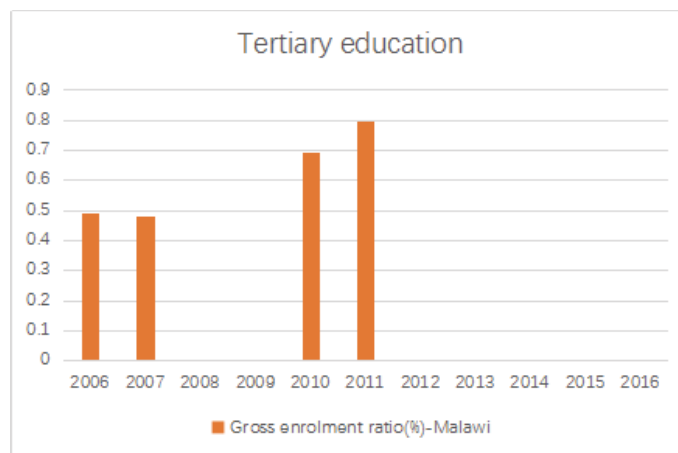
- ◆ Access and delivery to support teaching and learning through MOOC e.g. visits to the Tsinghua University , Xuetangx in charge of MOOC Platform which can be applied to Cendlos in Ghana
- ◆ Cloud Computing and Big Data e.g. EMIS data platform and the Computerized Schools Selection and Placement System
- ◆ Network Security Trends and Solutions for the protection of Educational Data.
- ◆ Mobile Learning which aims at Expand the reach and equity of education by helping in achieving Equity and Access to ICT Infrastructure so far as Education is concern.

3.7 Malawi



©University of Malawi

Education in Malawi stresses academic preparation leading to access to secondary school and universities. However, few students go on to high school or university. University system in the country include University of Malawi, the University of Malawi University of Science and Technology, Mzuzu University and Catholic University of Malawi. In 2011, the gross enrolment ratio is only 0.8%.



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Malawi ICT in Higher Education Development Plan

- ◆ Policy
 - » ICT Policies: no coordination, poor implementation
 - » No ICT in Higher education Policy
 - » No OER Policy
 - » ODL policy- Under development

- » Inclusion of ICT development plans into organization strategies
- ◆ Management
 - » Low levels of automation of administration processes
 - » Non-existent Big data culture awareness
 - » Inadequate knowledge of latest advances in technology
 - » Minimal collaborations among institutions
 - » Integration of systems within and among institutions
- ◆ Teaching and Learning
 - » Insufficient digitization of learning content for blended learning and ODL
 - » Limited use of ICT teaching tools and resources among academic staff
 - » Poor sharing of resources among higher education institutions e.g. eduroam, integrated libraries
 - » Low investments in modern learning environments e.g. virtual labs, smart classrooms
 - » No use of teaching and learning analytics through big data technology
 - » Low usage and production of OER
 - » Underutilization of PPP opportunities to widen access to education e.g. teaching/learning equipment
- ◆ Infrastructure
 - » Weak security in network systems and applications
 - » Lack of infrastructure policies .e.g. DRP, Security policy
 - » High costs of internet connectivity
 - » Limited sharing of infrastructure and capacity among ICT technical teams

Malawi Work Plan

See next page

Malawi Work Plan

Objectives	Activities	Key Performance Indicators(KPI)		Timeline				Stake Holders
		Current	Target	2018	2019	2020	2021	
1. Development of enabling ICT in Higher Education Policies	1.1. Development of a unified policy toolkit for HE institutions	0	1					ICT Managers, ICT Committees, VC, Principals
	1.2. Capacity building in policy formulation and application of policy toolkit	n/a	100%					ICT, Executive Management
	1.3. Develop a business case for wider inclusion of ICT development in overall institutional strategies	0	1					ICT Managers
2. ICT in Higher Education Management	2.1. Automation of administrative processes	40%	100%					Registrar, ICT Managers, Management

(continue on next page)

(continued)

Objectives	Activities	Key Performance Indicators(KPI)		Timeline				Stake Holders
		Current	Target	2018	2019	2020	2021	
2. ICT in Higher Education Management	2.2. Staff training on usage of ICT tools and systems. Increase frequency of continuous professional development (CPD) sessions	3hrs/wk	5hrs/wk					Registrar, ICT Managers, ICT teams, Administrative staff
	2.3. Develop institutional big data policy	0	1					Registrar, ICT Manager, Management, Administrative staff
	2.4. Development of MOU between ICT departments for joint projects	0	1					Registrar, ICT Managers, Management, ICT teams
	2.5. Conduct information needs assessment to identify information sharing requirements among HE institutions	0	1					Registrar, ICT, Management
	2.6. Develop a standard API for information exchange among HE institutions	0	1					Registrar, ICT, Staff

(continue on next page)

(continued)

Objectives	Activities	Key Performance Indicators(KPI)		Timeline				Stake Holders
		Current	Target	2018	2019	2020	2021	
3. ICT in Teaching and Learning	3.1. Digitization of classroom learning content	10%	100%					ICT, Registrar, Academic staff, Deans, Students
	3.2. Procurement of modern ICT learning facilities	30%	90%					ICT, Registrar, Academic staff, Deans, Students
	3.3. Adoption of big data analytics platforms for learning/teaching enhancement and decision making	0	1					ICT, Academic staff, Deans, Students
	3.4. Formation of Public- Private Partnerships (student/ staff development, learning equipment, infrastructure)		5					Registrar, ICT, Academic staff, Deans
	3.5. CPDs in usage of MOOCS and OER							ICT, Academic staff

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Objectives	Activities	Key Performance Indicators(KPI)		Timeline				Stake Holders
		Current	Target	2018	2019	2020	2021	
		4.1. Develop an improved model for Internet bandwidth procurement for all institutions	0	1				
4.2. Develop infrastructure policy toolkit – DRP, security policy, ICT Use policy	1	2					ICT committee, ICT	
4. ICT Infrastructure for Higher Education	4.3. Form infrastructure sharing or co-location agreements with other institutions	0	1					VC, Registrar, ICT
	4.4. Conduct a ICT skills assessment among technical teams in HE institutions (ICT skills assessment report)	0	1					ICT
	4.5. Form agreements among ICT departments in HE institutions for skills exchange	0	1					VC, Registrar, ICT



Chapter 4

Conclusion

Conclusion

The 21-day Seminar fully showcased China's experiences and achievements in higher education innovation, China's extensive and profound culture, and the success of Shenzhen's modernization, which helped participants to fully understand and then draw lessons from China's experience and strength, and thus to substantially enhance their capacity. Additionally, this Seminar provided a platform for participants from 7 African countries to communicate and acquire knowledge, technologies and successful cases of ICT application in higher education.

The following goals have been achieved in this Seminar on ICT in Higher Education Innovation for African Countries:

- ◆ **Shared China's experience of reform and development with African countries and explored opportunities for future cooperation.**

Qu Jian, vice president of China Development Institute gave a report on "Sino-African Cooperation in Recent Years". He shared with participants on the development experience of China's reform and opening-up, as well as the promising future of Sino-African cooperation. Dr. Emad Eldin Mahmoud H., CEO of the Science and Technology Development Fund, Ministry of Higher Education, former Vice Dean of Faculty of Engineering for postgraduate and research of Ain Shams University, Egypt, said, "It's quite a pleasure to be here in China, learning that what we read is not what we see, and now I see more about China than I learned in the past."

Dr. Emile Kenmogne from Cameroonian Ministry of Higher Education said, "China is awakening and we are glad that Cameroon is one of the great friends of this new China. It seems that Africa would gain more rather than lose by adopting such an approach where China presents herself to her audience with humility and respect of values, without giving the impression first to derive any advantage from being world's second economic power."

- ◆ **Built a platform for communication and cooperation among governments, enterprises and universities in African countries and China.**

During the Seminar, participants visited 8 enterprises and 4 top Chinese universities in Beijing, Guangzhou and Shenzhen and had a lot of communication with them. Ms. Haregewoin Mirota, Director of ICT and Data Management Directorate of Ethiopian Investment Commission, said “It is really a very great opportunity for us to share such great experiences with Chinese entrepreneurs, and professors from China and other countries. The content of the Seminar is very relevant to our office duties. Now we have something great to speak about China and the great economic performances of the country. This Seminar encouraged us to think of some kind of investment/business, academic and research links with Chinese companies and universities.”

Zelalem Lemma from Ethiopian Investment Commission said, “The technologies used in China’s education institutions are surprisingly advanced. The different high-tech enterprises we visited are committed to improving educational quality with ICT.”

◆ **Improved capacities on ICT policy-making, ICT-enabled teaching and learning and ICT techniques for government officials and faculty from higher education institutions in African countries.**

The seminar provided 5 policy-related courses in which participants from 7 countries presented the overview of ICT policies in their respective countries and universities and participated in policy-making workshop. The ICT-enabled teaching and learning courses in the seminar covered many hot topics in the field of higher education, such as knowledge society, mobile learning, instructional design models and tools. Participants took part in 3 workshops, including Open Educational Resources workshop, MOOC curriculum design workshop and user interaction design workshop, which greatly improved their ability to use ICT to develop curriculums and utilize resources. The technology-related courses were integrated with internationally recognized programs of Huawei Academy. 16 participants completed courses of Network Security Trends and Solutions, Cloud Computing and Big Data. Dr. Yalemzewd Negash, Dean of School of Electrical and Computer Engineering of Addis Ababa University, Ethiopia, said “We have tried to answer the question ‘what is the secret of the China's dynamic growth?’ Well Planned, Well Organized, Dedicated People. We learnt how growth can be achieved

Conclusion

without compromising culture. I hope there will be more cooperation between Ethiopia and China in training because most of our teachers, educators and students don't know how to use the equipment in a better way. I expect more related cooperation projects in the future and we can jointly design some courses to tap the full potential of our cooperation." Dr. Emile Kenmogne from Cameroonian Ministry of Higher Education said "China is well advanced in ICT application in education. ICTs are methodically implemented from nursery school to higher education. This experience is a model for the Republic of Cameroon."

◆ **Compiled outcome documents on developing ICT in higher education in the 7 countries.**

In the seminar, participants in different groups were required to formulate their respective Country/University ICT Application Proposal concerning policy making, administration, teaching and learning, evaluation and ICT infrastructure, based on what they have learned during the Seminar, and also in view of the specific economic situation and development in their countries. Participants from the 7 countries presented their design of ICT policies and development plans of their own country or institution, which are compiled in this report for further sharing.

The following consensuses have been reached between the participants and UNESCO-ICHEI:

◆ **Incorporate ICT application into national higher education policy and mid-term or long-term national strategic plan.**

Some African countries have made initiatives in applying ICT to illiteracy elimination and elementary education development, to which UNESCO has made great contributions. However, most African countries, especially those in the sub-Saharan area, have done very little in making use of ICT to achieve higher education innovation. Thus it is quite necessary to formulate ICT related higher education policy on national level or to incorporate ICT enabled higher education into the national strategic plan to stimulate development of ICT in higher education in the whole country.

◆ **Continuously improve ICT infrastructure construction.**

In recent years, due to the fact that many African countries start to pay attention to the development of ICT and thanks to the investment in related fields by some foreign enterprises, most African countries have made some progress in ICT construction. There have been broadband networks in major cities in most Sub-Saharan African countries, but the network coverage rate is still very low. The insufficiency of computers in higher education institutions and instability of power supply in some countries have seriously impeded the application of ICT. Therefore, it is necessary to strengthen the construction of ICT infrastructure, increase network coverage in higher education institutions, add enough equipment such as computers in universities to meet the basic need for ICT application in higher education.

◆ **Conduct capacity building in a holistic manner for people involved.**

In order to guarantee effective ICT application in higher education institutions, there should be a systematic capacity building scheme for people involved in higher education.

For instance, the capacity of government officials to make policies on ICT in higher education, the capacity of university faculty to apply ICT in teaching, the capacity of ICT experts to build and develop ICT equipment and platforms and the capacity of university students in using ICT to strengthen their learning activities. Therefore, it is necessary to carry out specific and systematic capacity building to improve the ICT literacy of interested parties.

◆ **Explore effective online education model.**

Recent years have witnessed rapid development of online education platforms. Many countries and university alliances have developed their own online education platform, for instance, Massive Open Online Courses (MOOCs) such as Edx, Coursera, XuetangX. Platforms like Moodle have also been used extensively. Additionally, the development of Micro-lesson and Open Educational Resources (OER) has all enriched the

Conclusion

concept of online education. African countries, especially those in Sub-Saharan region, should make full use of the existing resources and at the same time explore their specific online education model, in accordance with their economic and social development conditions, so as to meet demands of more people for higher education.

◆ **Strengthen cooperation among governments, higher education institutions and private sectors.**

The development of ICT application in higher education involves various stakeholders. Government should formulate ICT related educational policy to stimulate related actions from different stakeholders. Universities are pioneers and practitioners for the endeavour of ICT application in higher education. Private sectors are important participants in this field and should play an active role in ICT enabled higher education innovation. Therefore, there should be a cooperation mechanism among government, higher education institutions and private sectors to strengthen and coordinate actions in an effective manner.

◆ **Strengthen international and regional cooperation.**

The development of ICT application in higher education has witnessed a rapid development in many countries and they have accumulated plenty of experience and good practices. UNESCO-ICHEI is committed to building a platform for mutual learning and improvement in higher education innovation among cooperative countries. African countries can either learn from the existing practices and experience of developed countries, or strengthen cooperation with other countries to explore regional cooperation and development. UNESCO-ICHEI is willing to organize seminars, forums and conference regularly to activate the partner network for mutual development.

Based on the above consensuses, International Centre for Higher Education Innovation under the auspices of UNESCO plans to take the following measures:

◆ **Continuously improve capability of policy makers, faculties,**

technicians and other stakeholders in higher education.

Participants of the Seminar on ICT in higher education had expressed strong will to take part in future trainings and hoped that their countries and institutions could attend similar seminars held by UNESCO-ICHEI. Some institutions such as Addis Ababa University wished that similar seminars could be held in Ethiopia so as to provide more people with access to necessary capacity building. UNESCO-ICHEI will hold seminars for ICT application in higher education in African countries annually. In 2018, several specific seminars, including seminar for ICT in higher education policies, seminar for MOOCs and seminar for application of cloud computing and big data in higher education, are planned.

◆ Take the lead to build well-equipped smart classrooms for universities.

UNESCO-ICHEI will assist its partner universities to build their digital learning ecosystems in their long-term institutional planning step by step, which allows them to take charge of comprehensive affairs related to ICT in higher education and ICT-related policy-making in institutions, and to guide all ICT-supported teaching, administration and research activities (e.g. professional training on the ICT literacy of teachers, design of distant and online teaching curriculum, production of MOOCs and Micro-courses), as well as to develop localized university education information platforms and to develop them into national hubs of higher education ICT network platforms in their countries. The first smart classrooms will be built in following universities: Ain Shams University (Egypt), Addis Ababa University (Ethiopia) and University of Djibouti (Djibouti). In consideration of cross-campus teaching in African universities, the smart classrooms can provide higher education with equal quality for different campuses.

◆ Build cooperative platforms for governments, higher education institutions and enterprises.

ICT building in higher education is a systematic project which needs joint participation and cooperation of governments, universities and enterprises. With the Belt & Road Initiative going on, more and more

Conclusion

Chinese enterprises are investing in Africa on their constructions and developments. Realization of higher education innovation in African countries is one of focuses. UNESCO-ICHEI has cooperated with many educational, technical and ICT enterprises to carry out this work effectively. For instance, UNESCO-ICHEI has signed strategic cooperation agreements with Huawei and Weidong Cloud Education Group and jointly take part in the higher education innovation and development in African project countries. In the future, more and more enterprises will invest in the African higher education through UNESCO-ICHEI's platform, which will make great contributions to higher education development in Africa.

◆ **Build a partnership network and communication platform for ICT application in higher education.**

Information sharing and mutual learning are significant ways of achieving progress. Productive works in field of ICT application in higher education had been conducted in multiple countries and African countries can learn from those countries and explore their own development modes based on their learning results. Therefore, UNESCO-ICHEI is committed to building a partnership network for higher education innovation to create a platform for regular information exchange and mutual learning, in order to support and share creative experiences and practices of ICT application in higher education.

Members of the network include: the ministries of education, universities and related enterprises of the project countries in Africa; UNESCO Headquarter, field offices, Category I and Category II institutions; higher education and ICT related enterprises. By hosting international conferences, forums, seminars and training workshops on higher education innovation, UNESCO-ICHEI will regularly motivate the network, to maximize positivity of network member participation and encourage information sharing/exchanges and explore potential cooperation.



Appendix




Seminar on ICT in Higher Education Innovation for African Countries 2017




Agenda


7-27 August 2017,
Southern University of Science and Technology (SUSTech), Shenzhen, China

Note

The training sessions are designed for three groups of people:

-  Policy Maker and Administrator (who are interested in ICT in education policy)
-  Educator (who are interested in using ICT in teaching and learning)
-  Technical Expert (who are interested in ICT technology)

The participants are recommended to customize their study plan according to their need and interest. For example, if you identify yourself more as technical expert, training sessions with  under Category column are highly recommended. However, you're also advised to take several sessions for  Policy Maker and Administrator and  Educator to get a panoramic perspective.

Date	Time	Category	Session	Lecturer/Facilitator
Arrival 6 August	All Day	SHENZHEN 	Registration	Ms Sarah LI, Ms BI Xiaohan Programme Officer of UNESCO-ICHEI

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Date	Time	Category	Session	Lecturer/Facilitator
Day 1 7 August	09:30-12:00	Orientation 	Introduction Assignment Arrangement	Prof. Dr. Andrew ZHAO Senior expert of UNESCO-ICHEI
	12:00-14:00	Lunch	Administrative Arrangement	Ms Sarah Li, Ms BI Xiaohan
	14:00-15:00	Common Course 	Participant Selfintroduction Ice-breaking Activity	
	15:30-16:30		Recent China-Africa Cooperation	Dr. OU Jian Deputy Director of China Development Institute
	17:00-19:00	Dinner	Elementary Chinese Language	Ms Rebecca ZHU Hong Kong University
Day 2 8 August	08:30-10:00	Opening Ceremony 		Prof. Dr. LI Ming Director of UNESCO-ICHEI
	10:15-11:15	Common Course 	Safety Briefing	Municipal Public Security Bureau
	14:00-17:00		Forum on Higher Education Innovation: University Cooperation and Innovation	Prof. Dr. LI Ming Director of UNESCO-ICHEI
	19:00-21:00	Night of Culture 	Performance and drinks provided. Participants are recommended to wear traditional clothes.	

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Seminar Agenda

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Date	Time	Category	Session	Lecturer/Facilitator
Day 3 9 August	09:00-12:00	Common Course 	Overview of ICT in Higher Education in Africa	Mr. Jaco du Toit, Adviser for Communication & Information, UNESCO Nairobi Office
	14:00-17:00		ICT Application & Planning at National and Institutional Level	Prof. Dr. Andrew ZHAO
Day 4 10 August	09:00-12:00	Specialized Course 	ICT Policy Making Workshop	Mr. Jaco du Toit
	14:00-17:00			
Day 5 11 August	09:00-12:00	Specialized Course 	ICT in Education and Education 2030	Dr. MIAO Fengchun Chief of ICT in Education UNESCO
	14:00-17:00	Specialized Course 	Open Educational Resources Workshop	Mr. Jaco du Toit
Day 6 12 August	 BEIJING		 GUANGZHOU	
	Morning	Travel to Beijing		
	14:00-16:00	Cultural Tour 	Weidong Chinese Cultural Museum	



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Date	Time	Category	Session	Lecturer/Facilitator
Day 7 13 August	09:00-12:00	Field Visit 	Weidong Cloud Education Group	
	14:00-18:00	Specialized Course 	Higher Education in China	Higher Education Evaluation Centre, MOE
Day 8 14 August	10:00-12:00	Cultural Tour 	World Cultural Heritage: Forbidden City	
	14:00-16:00	Field Visit 	MOOC Platform: XuetangX	
Day 9 15 August	08:00-17:00	Cultural Tour 	World Cultural Heritage: the Great Wall	
	Morning	Flight to Guangzhou		
Day 10 16 August	14:00-20:00	Cultural Tour 	Chen Clan Ancestral Hall, Lingnan Park, Pearl River Cruise	
	09:00-12:00	Field Visit 	South China Normal University	
Day 11 17 August	14:00-16:00	Field Visit 	School of Information Technology in Education	
	Evening	Back to Shenzhen		












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Date	Time	Category	Session	Lecturer/Facilitator
 SHENZHEN				
Day 12 18 August	09:00-12:00	Specialized Course 	Creating a Multilevel Leadership Infrastructure for ICT-enabled Higher Education Innovation	Prof. Dr. Nancy Law the University of Hong Kong
	14:00-17:00	Specialized Course 	Using Learning Design Patterns and Tools to Integrate ICT into Higher Education	Prof. Dr. Nancy Law
		Cultural Tour 	Artron Art Group and Painting Village	
Day 13 19 August	09:00-12:00	Field Visit 	Huawei Technologies Co., Ltd.	
	14:00-17:00	Field Visit 	Unmanned Aerial Vehicle Co.	
Day 14 20 August	09:00-12:00	Specialized Course 	Network Security Trends and Solutions	Ji Xiaodong Huawei Global Technology Training Center
		Field Visit 	Shenzhen Metro	
	14:00-17:00	Specialized Course 	Network Security Trends and Solutions	Ji Xiaodong
Day 15 21 August	09:00-17:00	Specialized Course 	Cloud Computing Training	ZHAO Jing Huawei Global Technology Training Center
		Specialized Course 	MOOC: Design, Implement and Applicate Online Course	Prof. Dr. MU Su South China Normal University

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Date	Time	Category	Session	Lecturer/Facilitator
Day 16 22 August	09:00-17:00	Specialized Course 	Cloud Computing Training	ZHAO Jing
Day 17 23 August	09:00-12:00	Specialized Course 	MOC: Design, Implement and Applicate Online Course	Prof. Dr. MU Su
		Specialized Course 	Big Data Overview	ZHAO Jing
Day 18 24 August	14:00-17:00	Specialized Course 	MOC: Design, Implement and Applicate Online Course	Prof. Dr. MU Su
		Specialized Course 	Big Data Overview	ZHAO Jing
Day 19 25 August	09:00-17:00	Specialized Course 	Self-preparation: Presentation for Assessment	
		Specialized Course 	Fundamentals of User Interaction Design	Prof. Dr. LIU Haiming
Day 20 26 August	14:00-17:00	Specialized Course 	Fundamentals of User Interaction Design	Prof. Dr. LIU Haiming
		Assessment 	Self-preparation: Presentation for Assessment	
Day 21 27 August	09:00-12:00	Specialized Course 		Prof. Dr. LI Ming, Prof. Dr. Andrew ZHAO, Ms Sarah LI, Ms BI Xiaohan, Dr. SONG Hang, Ms Rebecca ZHU
		Closing Ceremony 		Prof. Dr. LI Ming, Prof. Dr. Andrew ZHAO, Ms Sarah LI, Ms BI Xiaohan, Dr. SONG Hang, Ms Rebecca ZHU
	12:00-	Checkout & Departure		







SHENZHEN
深圳





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