8th AU GENDER PRE SUMMIT

Girls and Women’s Education in Africa with Emphasis on STEM and TVET

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African Union Headquarters
Addis Ababa
Ethiopia

AFRICAN UNION/
INTERNATIONAL CENTRE FOR GIRLS AND WOMEN EDUCATION IN AFRICA
(AU/CIEFFA)
BRIEF ON

AFRICAN UNION/INTERNATIONAL CENTRE FOR GIRLS AND WOMEN EDUCATION IN AFRICA

(AU/CIEFFA)

AU/CIEFFA is a specialized institution of the African Union since 2004, dealing with women and girls’ education following Decision Assembly/AU/DEC.44 (III). The centre is located in Ouagadougou, Burkina Faso.

AU/CIEFFA has been established under the Department of Human Resources Science and Technology at the African Union Commission to coordinate the promotion of girls and women’s education in Africa, with a view of achieving their economic, social and cultural empowerment.

The centre works closely with AU member States and government, civil society and international partners to implement its programme and activities and maintains specific working relationship with UNESCO to ensure a strong partnership in the implementation of its programs.

1. MISSION

AU/CIEFFA will contribute to building an integrated, prosperous and peaceful Africa by ensuring that all girls and women have the required competencies to respond to life challenges, as well as sustaining Africa’s sustainable development.

The mission of AU/CIEFFA is in line with the vision of Agenda 2063, which outlines that the African woman will be fully empowered in all spheres, with equal social, political, and economic rights and opportunities and enabled to fight against all forms of violence and discrimination.

2. AIM

AU/CIEFFA aims to provide necessary policies, lines of actions, strategies and guidance to all relevant stakeholders to address gender equality, equity, leadership and advocacy in learning environment in order to create gender sensitive schools, to increase girls’ access and retention in education systems in the African continent.

3. OBJECTIVES
AU/CIEFFA’s objectives are in line with the Continental Education Strategy for Africa (2016-2025) and are manifold:

i. promote girls’ and women’s education at primary, secondary and tertiary levels

ii. Promote gender mainstreaming in education policies and development programmes;

iii. Build the operational capacities of Member States on girls and women’s education issues;

iv. Establish network for information and experience sharing on girls and women’s education;

v. Develop strategies and innovative approaches for advocacy and a fruitful partnership to promote and consolidate girls and women’s education.

vi. Promote research on girls and women’s Education issues

vii. Conduct observatory activities on the status of education and training for girls and women in Africa.

viii. Organize training on information and data collection, management and programmatic use

ix. Monitor and report on decisions and programmes implementation at national, regional and continental levels.

4. **Gender Pre-summit**

This Session on “Girls and Women’s Education in Africa with Emphasis on STEM and TVET” was organised by the African Union - International Centre for the Education of Girls and Women in Africa (AU/CIEFFA) in line with its aim and objectives.
CONCEPT PAPER

Girls and Women’s Education in Africa with emphasis on STEM and TVET

Parallel Session 6

Access to basic primary education has increased in most of our countries due to the intensive and worldwide efforts and contribution to the implementation of the Objective 2 of the MDGs. Even though most African countries will have reached universal primary enrolment rate by 2015, low completion and the rate of repetition remain a challenge. The EFA Global Monitoring Report (2013-2014) underlines that in sub-Saharan Africa, only 23% of poor girls in rural areas will have completed primary education by the end of 2020. If recent trends continue, the richest boys will have achieved universal primary completion in 2021, but the poorest girls will not catch up until 2086. Research has also shown that girls from the poorest families in sub-Saharan Africa are only expected to achieve lower secondary completion in 2111. Almost two-thirds of illiterate adults are women. The poorest young women in developing countries may not achieve universal literacy until 2072.

Thus, simply getting girls into primary school does not ensure that they complete their schooling. Gender disparities must be addressed, and education and learning adapted to the needs, interests and expectations of boys, girls, women and men. As regards gender, girls are the most excluded in many countries, however in some countries, more boys are excluded. Targeted measures are needed to get girls and boys to school and keep them there until they complete a full course of education, up to university level, equipped with the adequate skills they need for their lives and livelihoods.

Educational systems are also faced with the challenge of science and technology education that has declined in quality at a time when human, social and economic development is hinged on the mastery of science, technology and engineering. Tremendous opportunity exists to tap into current scientific and technological developments to enhance the teaching and learning of these subjects, whilst also increasing African content to enhance relevance and learner performance. Although there has been some progress in the advancement of women in STEM (Science, Technology, Engineering and Mathematics) in African countries, the continent still lags behind Western nations and some Asian and Latin American countries in terms of capacity-building initiatives, gender equality and equity and systematic operational frameworks to advance and sustain change.

Technical Vocational Education and Training (TVET) is often considered to be an effective strategy to empower marginalized groups such as girls by increasing their employability. At the same time, access to skills training provided by formal technical and vocational training institutions is often
limited for these groups. There are various reasons for this, such as insufficient basic education qualifications, direct and indirect costs of enrolment, lack of understanding of the usefulness of training, etc. Young women from poor communities are especially disadvantaged in this regard, due to community or family beliefs that undermine the potential role women can play to contribute to sustainable and productive livelihoods. Available training opportunities are often confined to ‘feminine’ areas, which may not necessarily lead to profitable work. Even when enrolled in training courses in more male dominated areas, girls and women can face barriers, e.g. when the learning environments are de-motivating and do not take into account their specific needs.

Panel Members of Session on “Girls and Women’s Education in Africa with Emphasis on STEM and TVET”
Parallel Session 6
Small Conference Room 1

Girls and Women’s Education in Africa with Emphasis on STEM and TVET

Moderator: Hon. Lydia Raharimalala Toto,
Member of Parliament, Madagascar, Vice Chair, FAWE

Objective: To share progress, challenges and opportunities for women in Science, Technology, Engineering and Mathematics (STEM) and in Technical Vocational Education and Training (TVET).

1. Best Practices of Girls and Women’s Education in Africa Dr. Rita Bissoonauth, Coordinator, AU/ CIEFFA

2. Enhancing Skills of Girls and Women Dr Folasade Ayonrinde, Senior Program Officer ACBF

3. Women in Research Ms. Elizabeth Rasekoala Consultant, Cape Town, South Africa

4. Boosting women Teachers in Science Dr Patience Awopegba Program Specialist, UNESCO-IICBA

5. Women and ICT Prof. Salwa Abd-El-Hafiz, Professor, Cairo University, Egypt (Laureate 2014 AU/Kwame Nkrumah Scientific Awards)
OUTCOME:

Girls & Women’s Education in Africa with Emphasis on STEM & TVET

This parallel session took place on the 20 January 2016 in Conference Room 1, within the African Union Commission, Addis Ababa Ethiopia. This parallel session was moderated by former Minister of Education of Madagascar, Ms. Hon. Lydia Raharimalala, Vice-Chairperson of FAWE.

1. Key messages

- Importance of girls and women in STEM and STEM education:
- The future of Africa depends on innovation in Science and technology; women must play a role in this.
- A large proportion of critical skills needed to achieve Agenda 2063 are in STEM; 9 of 17 SDGs require science and technology inputs
- Necessary for productivity, job creation (on a continent with high youth unemployment) and wealth creation (empower and improve quality of life for women)

2. Challenges

- Societal attitudes and gender expectations/norms - women and girls end up concentrated in programs in fields traditionally filled by women (secretarial, child care, etc.); child marriage and school dropouts
- Poor access to information on research funding and opportunities as well as resources to write successful proposals; scholarship opportunities are not sensitive to the needs of women (e.g. opportunities abroad are not conducive for women with children)
- Lack of women in research and academic STEM positions to serve as role models for girls and women
- Outdated STEM policies which remain frozen in post-colonial frameworks
- Persistent use of outdated methods of teaching science
- Societally unvalued TVET; already keeping marginalized women from engaging
- Lack of gender disaggregated data
- Poor internet access
- High illiteracy rates of women and girls and their lack of having ICT training thus leading to gender gap increases between men, boys and women girls
3. **Recommendations**

- To challenge and change girls’ and boys’ (society’s) perceptions of STEM and TVET; legislation alone will not suffice
- Need for “Africanization” of higher education: re-orient entire African education system and institutions to current aspirations through the renewal STEM policies in Member States in line with current issues and context
- Targeted measures to get and keep boys and girls in schools; develop and implement gender action plans to increase women’s participation in science related courses; gender sensitive curricula and schools are needed
- Mentoring programs – support young and immerging women researchers and academics to develop post-graduate qualifications
- Get women in research/academic leadership roles to serve as role models - where we have women role models you find higher women retention rates
- Disseminate information and capacity building (to address poor access to apply for and develop successful applications) best practice and trainings
- Better gender disaggregated data and collection methods
- Reinforce the revitalization and promotion of TVET in Member States
- Make use of social medias to stop school related Gender-Based Violence (SRGBV)
- Increased synergy between Ministers of Gender, Ministers of Women’ promotion and Ministers of Education
Presentations
Best Practices of Girls and Women’s Education in Africa

Dr Rita Bissoonauth
AU/CIEFFA Coordinator
Introduction

• In-depth case studies of countries that are providing education to diverse groups of learners, with special emphasis on girls’ and women’s education.

Objectives of country specific case studies are to:
• Provide opportunities for knowledge sharing and learning with other Member States
• Strengthen the practice-policy-research connections
• Inform teacher education institutions to rethink the way teachers are trained
• Inform policy dialogue in light of post-2015 sustainable development goals.

Questions guiding case studies

• What are the main barriers to inclusive education in your country?
• How can we ensure that the most disadvantaged, especially girls, have access to school and learn?
• How are issues of gender addressed in the transition (from primary to secondary education) process?

• What measures does the country take to ensure that girls stay in school until they complete a full course of education (primary and secondary)?
• Does teacher training include training on how to address the diversity of learning needs? To what extent teachers receive gender-sensitive training?
Methodology guiding choice of countries

Different REC's from the regions had as task to identify countries in their regions according to the following criteria:

- Gross Admission rates of girls in schools at pre-primary, primary and secondary
- Gross Enrolment Ratio girls in schools at pre-primary, primary and secondary
- Percentage of girls in the education system

Countries chosen for case studies

- North: Algeria
- East: Tanzania
- West: Côte d’Ivoire
- Central: Chad
- South: Zambia
Defining Inclusive Education

- Inclusive education is a process that involves the transformation of schools and other centres of learning to cater for all children – including boys and girls, students from ethnic and linguistic minorities, rural populations, those affected by HIV and AIDS, and those with disabilities and difficulties in learning and to provide learning opportunities for all youth and adults as well.

Algeria

- Highest Human Development Index out of the 5 countries, esp. in terms of educational achievement

- Basic principles of an inclusive education system entrenched in the Algerian Constitution
- High primary GER and NER -93%

- Education compulsory from 6-18 years, but 7.8 Mean years of schooling for men compared to 4.8 years for women

- Gender gap as more boys/men getting schooling than girls/women
**Tanzania**

- Emerging as an economic success as it has been experiencing a steady growth of its economy

- High ranking in Human Development Index (HDI): 151 compared to 172 and 185 for Cote d’Ivoire and Chad

- Gender gap is less acute as shown by its literacy rates (72% for women vs. 76% for men)

- High Gender Development Index (0.971); the highest of the five countries

**Ivory Coast**

- Recovering from a decade of civil conflict, with havoc on its economic and social sectors.

- However, even prior to the conflict there had been important inequities within its education systems as illustrated by the 20 percentage points difference in literacy rate between women and men and the low Gender Development Index.

- Mean years of schooling for men: 5.8 and women: 4.5
Chad

- Struggling to develop its education sector in order to provide more opportunities to all the segments of its population.
- Notable progress with regard to GER (103%) as more schools are being built but gaps between genders in terms of access at all levels, literacy rates
- Literacy rates for 15-24 years: 56% for men and 78% for women.
- Mean years of schooling for men: 2.9 and women: 1.0

Zambia

- Education not compulsory, but Education Act 2011 identifies each person’s rights to education
- Highest with Algeria in GER and moving towards universal primary education
- Net Enrolment Rate: 74%
- Zambians getting more education as can be seen in the Mean Years of schooling for men: 7.3 and women: 5.8
Way forward

• Analysis of overall educational development relating to inclusive education in the five countries with special focus on girls and women’s education to underscore key explanatory factors in terms of achievements or lack of it thereof

• Publication and dissemination of reports for knowledge sharing and learning among Member States

• Review of types of policies and programs put in place to implement inclusive education with emphasis on girls and women’s education and their outcomes in terms of access, quality and relevance and equity
ENHANCING SKILLS OF GIRLS AND WOMEN

Folasade AYONRINDE, PhD
Senior Program Officer, ACBF

- Presented at the African Union 8th Gender Pre-Summit
- Addis Ababa, Ethiopia
- January 20, 2016
Outline of Presentation

- Skills and Development – Relevance
- Capacity Imperatives for the Agenda 2063
- Factsheet on Education and Skills in Africa
- Need for Action: Agenda 2063 as a Major Link
- Strategies for Enhancing skills of Women and Girls
- ACBF's Contribution
- Concluding Remarks

Relevance of Skills Development

- In the context of the knowledge economy, skills development in the form of education and training provide sound investments for a country and region.
- Skills development is important in Africa today as the continent aims to become an influential and critical player in the world.
- Implementing the transformation agenda of Africa requires investment in human capital to channel the continent towards “The Africa We Want”.
- Enhancing human capacity and skills for the implementation of Agenda 2063 would provide the continent with the foundation to deliver on the flagship projects and programmes in the first 10-Year Implementation Plan.
- Against this background, a low level of Critical Technical Skills (CTS) constitutes a significant threat to achieving “The Africa We Want”.

Agenda 2063 Capacity Development Imperatives

- African Union Commission Heads of States' decision and interest to review the capacity required for the implementation of Agenda 2063.
- Following that intent, the African Capacity Building Foundation (ACBF) has been leading the exercise on capacity imperatives for the implementation of Agenda 2063.
- Purpose: to address the capacity strengths and opportunities of continental and regional institutions in implementing Agenda 2063.
- Key Deliverables:
  2. Capacity Development Plan Framework Document
  4. Assessment of risk for Implementation of Agenda 2063

Skills Required for Agenda 2063

- Many different skills are required to deliver on such a wide-ranging and all-encompassing continental initiative as Agenda 2063.
- The different skills required are clustered in the key thematic programmes and programs as set out in the A2063;
  - Agriculture and Food Security
  - Mineral Resources and Extractives
  - Regional Integration and Trade
  - Wealth Creation and Management
  - Pan-Africanism and Governance
  - E Society
  - Wellness and Health
- Most of the skills required in these areas are cross cutting but most are mainly in the Science, Tech, Engineering and Mathematics arena.
- Aside these, Agenda 2063 also critically requires home-grown African-issue specialists - non-traditional occupational categories deal with political, economic and socio-cultural issues and underlying factors that are specific to Africa, Including Pan-Africanism, African conflict resolution, intra-African trade, regional integration, negotiating In the Interest of Africa, etc.
Critical Skills Lists for A2063

- Four Aspects of Operational Capacity for Organisations
  - Organisational set up, human capacity (hard and soft skills), work processes, access to information and knowledge

- Change and Transformative Capacities
  - Transformative leadership: Change readiness (creation of, and maintaining the desire for change); mind-set shifts; top leadership commitment and management; ownership of decisions; etc.

- Critical Technical and Sector Specific Skills
  - Science and technology and innovation/inventors; Engineers; Mining experts and specialists; Financial specialists; Health specialists/experts including doctors; Others

- Composite Capacities Category
  - Strategic Planning; Critical thinking and results-based management; Program development, project planning, and implementation; Partnership development and management; etc.

1. Agriculture engineers
2. Agricultural economists
3. Agricultural Scientists
4. Forestry Specialists
5. Agro-processing specialists
6. Food Scientists
7. Food Security Information Systems Specialists (FSIS)
8. Architects
9. Nutrition Specialists
10. Urban and Regional Planners
11. Construction financiers
12. Surveyors -Quantity Surveyors/Technicians, Road surveyors, General surveyors
13. Industrial Specialists - Industrial designers, Engineers/Technologists, Industrial machinery specialists
14. Engineering - Mining Engineers, Civil Engineers/technologists, electronic
15. Aeronautical engineers
17. Telecommunication specialists
18. Metallurgical Engineers/technologists
19. Electrical Engineering Technologists (Electrical Installation Inspectors)
20. Mining specialists and engineers
21. Materials Engineering Technicians
22. Mechanical Electrical Plumbing (MEP) Engineers
23. Chemical scientists/engineers/technologists
24. Railway and transportation engineers
25. Materials Engineers/technologists
26. Financial Investment Specialists
27. Geologists, Oceanologists, Marine Experts
28. Geologists, Oceanologists, Marine Experts
Emerging Facts on Skills in Africa

- The recent study undertaken by the ACBF on the capacity dimensions for Agenda 2063 showed the worsening trend in STEM as critical skills that is needed 50 years from now.
- Key sectors, esp. in the extractive industry are highly dependent on, and dominated by expatriates.
- There is scarcity of experience and qualified skills, particularly women in the required areas.
- STEM policies are out-dated and ‘frozen’ in post-colonial frameworks.
- TVET holds the key and promise for addressing a large part of the youth unemployment challenge, esp. when girls and women participate equally!

Factsheet on Africa cont.,

- ACBF/AUC Study on critical Skills for Agenda 2063 revealed that:
  - Africa’s stocks of human capital in CTS areas are exceedingly low.
  - Dearth of critical skills: There is low CTS enrolments at tertiary level and educational attainment ratios. E.g., the continent’s current share of engineer stands at 35 scientists and engineers per million people compared to 168 for Brazil, 2,457 for the European Union and 4,103 for the United States
  - Insufficient attention and focus on Science, Technology, Engineering, and Mathematics (STEM) and the Technical Vocational Education and Training (TVET).
- Current education system: 90% of African universities offer more non-CTS degrees; only 2% of Africa’s students specialise in agriculture, even though agriculture contributes 32% of Africa’s gross domestic product;
- Science, Technology, Engineering and Mathematics (STEM): it is estimated that only 28% of African students are enrolled in these STEM;
- Approximately 90% of African universities offer more non-critical technical skills (CTS) degrees
Facts on Skills in Africa

- (over 10,000 medical graduates born or trained in Africa migrated and were registered to practice in the United States alone in 2011)
- Africa’s annual graduates of 24,233 in Agriculture is the world’s lowest.
- only 3% of Africa’s students specialize in agriculture, even though agriculture contributes 32% of Africa’s gross domestic product;
- **A severe critical technical skills emergency is gripping Africa - a time bomb and transformation damper**
- As an example, although Africa accounts for 13.4% of the world’s people, it produces only 1.1% of the world’s scientific knowledge. In terms of gender, it is nowhere to be found.
- 45 percent of the 128 million children of primary school age in Africa are not learning basic literacy and numeracy skills after four years of school, per the Africa Learning Barometer.
- Although primary school enrollment in sub-Saharan Africa has increased from 59 percent to 77 percent in the last decade, large numbers of children leave school without acquiring basic knowledge, skills and competencies.

Factsheet Cont,...

- Although figures vary, the percentage of female science graduates is rising in Africa. But the reality is that women are still largely under-represented in key areas of science and tech.
- Education statistics in Sub-Saharan African (SSA) countries show that women continue to lag behind men in education in general and specifically in science, mathematics and technology (SMT) education.
- Also, more women and girls tend to study programmes related to so-called “women’s” occupations such as nursing, secretarial jobs and social work. Programmes in engineering, physics and the so-called “hard sciences” continue to be dominated by men and boys.
- In addition, the gender gap in higher education has remained stagnant, particularly in science related disciplines, where female enrollment rates stand at 39.9 percent as at 2013 (UNESCO).
Why is it important to enhance skills of women and girls?

- Since women have equal education rights and in many areas girls are now outperforming boys, it only makes sense to ensure that we do not lose scientists with high potential into the ceiling effect.

- The future prosperity of Africa depends upon the scientific and technological innovation. By restricting the pool of the best and brightest minds mainly to men, the outcomes that influence the scientific community and research will be less than it could be.

- If science is striving for excellence, gender bias should be avoided as we could be missing out talented scientists merely because of this bias.

- Scientists influence the focus of research and the general development of society. Such a responsibility cannot be a male-only responsibility.

PART II – Approaches to Enhancing skills of Girls and Women
Need for urgent action

Key fact that Africa has to note is the foundational role of African youth and women as the two critical game-changer stakeholders for achieving the vision of Agenda 2063:

- 1.1 billion: the number of Africans who will be of working age in 2040
- 65% of Africa’s population is under 35 years
- By 2020, 4 in 5 Africans will on average be 20 years
- Women Constitute 50.02% of Africa’s population

In recent times, there has been a global rise in the consciousness of the impact of gender issues in education and national development.

Hence, it has become imperative to come up with policies at all levels of the economy that would further reduce the gender gap in national development and STEM.

Science and technology are among the seven learning domains that are foundational to lifelong learning for any child, as identified by the Brookings Institution’s Learning Metrics Task Force.

- Importance of correcting the gender imbalance in STEM!

What to do?

- Closing the gender skills gap is of critical importance for all countries because failure to do so means the loss of vast human resources that could contribute to national development and could further entrench gender inequality in society.
- There is thus a need to ensure that girls take their role in society, esp. concerning 21st century skills. Changing girls’ and boys’ perception of STEM is therefore extremely important.
- While private-sector could use their own mechanisms to contribute in addressing the skills gap in the short-term, ownership of the African agenda dictates the urgency of looking at Critical Technical Skills from an African ownership perspective of Indigenization; including Industry/private sector and the educational system to focus on African needs and priorities.
- **Need for** Africanization of higher education; re-orient the entire African education system and institutions to current aspirations.
- Put in Place Appropriate Education system: Develop mechanism to formulate and articulate the content of Pan African curriculum in university; Making education, esp. STEM relevant to the national and continental context including African values, especially focussing on skill area of training that are a based on the needs and employment opportunities in the country.
Need for a Gender Action Plan

There is need for discussions to centre on how to:

- Increase women’s participation in science related courses;
- Raise the gender awareness of different categories of actors, within and outside the African Union Commission, involved in the design, the evaluation, the selection, the negotiation, the realization, the implementation of gender projects;
- Highlight the respective responsibility of each category of actors regarding the AU’s commitment to ensure gender equality and to implement a gender mainstreaming strategy in all its policies and programmes;

- Bridging the skills gap: Commission the establishment of platforms for tripartite social dialogue between labour unions, employers’ organizations and youth organizations;

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Figure 1. Enhancing Girls’ and Women’s Skills in Science

- Partnerships
- Story telling and collaborative pedagogy
- Promoting Women in Science
- Data Quality and Accessibility
- Gender-Sensitization Training for Teachers and parents
- Building on STEM Initiatives in Africa

Engaging Girls Early in Science
Strategies for Bridging the gap

- Empowerment and participation: Setting up systems and mechanisms for ensuring that visionary women are included in key decision-making processes for the Africa We Want; Design follow-up mechanisms that monitors the training and development of women on Agenda 2063;

- Agricultural Productivity and Production: Aggressively pursue mechanisms and programmes at all levels to take advantage of and leverage the potential of women as leaders and innovators in the agricultural sector;

- Mind-set transformation: Constitute mind-set transformation brainstorming team including academia, youth; organize a series of mind-set transformation pilot seminars across the continent;

- The number of women employed at continental, regional and national institutions: Design/implement employment-oriented internships at a larger scale the significant improves the involvement of young women in continental, regional and national structures;

- Reinvent the African education system with a focus on women: Advocate through dialogue, forums and policy development for an increased enrollment of women in science, technology, engineering, and mathematics;

- Flagship Projects: The development and implementation of a supply and demand system with an aim of achieving women participation in these projects.

Strategies: Academia (and think tanks)

- Mind-set transformation: Set up task teams to develop and implement a curriculum on African ideology, African Development Paradigm at all steps of the education process;

- Re-design the education system: Capacity building initiatives through redesigning of the current educational system to reform and design the content of a new African education agenda, grounded in African values and aspirations,

- Flagship Projects related to academia: Reorient the academic program, correct the disjuncture between university curricula to align with the imperatives of Agenda 2063

- Data and information: Reinvigorate the strengthening and expansion of technical, vocational education training centers through the development of focused-programs for Agenda 2063;

- Increase the number of trainers at African education system: Design and implement expert support processes to institute a new African data revolution approach and knowledge systems that build the capacity on African data production, use and maintenance and knowledge management system for delivering on Agenda 2063,
ACBF’s Contribution to Gender in STEM

- ACBF, as the premier institution on Capacity building, has also been making efforts in encouraging skills in the area of Science and Technology, particularly for women.
- In recent years, it has fostered gender mainstreaming as part of its core mandate. As part of our operations:
  - Ensuring inclusiveness of higher-education programs through its work in ensuring the targeting of women and the inclusion of participants from fragile states and countries in conflict. This has been done through reserved scholarships for women and targeted recruitment from fragile and post conflict states.
  - Encouraging development of specialized skills through collaborative programs for universities and training institutions, e.g. collaboration with the African Universities of Science and Technologies (AUSTs) through support to IIE (International Institute for Water and Environmental Engineering, Burkina Faso); Nelson Mandela-AIST, Tanzania, and Africa University of Science and Tech in Nigeria. ACBF provides scholarships for women at the Master’s level.
  - Supports the Women’s University in Zimbabwe with provision of scholarships to indigent women at all levels from Undergraduate to Doctorate levels.
  - In fact, the 2016 African Capacity Report will be focusing on Enhancing Capacities in Science and Technology with a section to be devoted on gender participation.
  - Supporting and collaborating with the AUC on the Agenda 2063 10 Year Capacity Development Implementation Plan

Concluding Remarks

- Nine (9) out of 17 SDGs require science and technical inputs, in addition to goals specifically calling for gender diversity. This optimally indicates the need for Africa to look ahead and plan a science agenda which encourages and embraces gender and that feeds into these development goals.
- A gender equity approach, which goes beyond trying to treat girls and boys the same, recognizes the prevailing gender inequality in the field of science and in society. It advocates for a strategic focus on girls in order to promote their participation, higher achievement and interest in science.
- This does not, however, disadvantage boys. What is good for girls is also good for boys. Equity and high quality very clearly work together in the case of science education.
- Legislation, though crucial, and positive actions alone do not necessarily achieve de facto gender equality.
- A conscious effort on the part of society to change attitudes and to accommodate difference is a prerequisite for an inclusive society.
‘Women in STEM Research in Africa: Progress, Challenges and Opportunities for Advancement’

Session 6 Presentation by
Dr Elizabeth Rasekoala

Chair: Pan-African Solidarity Education Network (PASEN)
President: African Gong – the Pan-African Network for the Popularization of S&T and Science Communication

At the 8th AU Gender Pre-Summit 17-21 January 2016, Addis Ababa – Theme: ‘Africa’s Year of Human Rights with a particular focus on the rights of Women’
**WOMEN IN STEM RESEARCH: ‘MIND THE GAPS!’**

- Access to STEM for women on an equal basis with men is necessary to transfer patterns of productivity, contribute to job creation and new ways of working and in promoting the establishment of a knowledge-based society resulting in wealth creation. Access by women to STEM also has the potential to positively contribute to improving the quality of life of women and men in African societies and communities.

- The full and effective participation of women in the decision-making and implementation processes related to STEM including planning and setting priorities for research and development and the choice, acquisition, adaptation, innovation and application of STEM for development, aptly captures the essence of the prerequisites for delivering gender equality for women and men in the scientific enterprise.

- The challenge that the African continent faces in this century is to turn these noble aspirations into actions. Thus, while there has been much progress in the social, life and natural sciences sectors, there is still a very stark gender divide in the physical sciences, engineering and TVET sectors on the African continent.

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**WOMEN IN STEM RESEARCH: CHALLENGES & OPPORTUNITIES FOR TRANSFORMATIONAL CHANGE**

There is a trend globally to create structures within the STEM domain, which specifically address and advise on mechanisms to enhance the contribution of women. Good Practice concepts include:

- Mentoring programmes to support young and emerging women researchers/academics in African Universities/research institutions, to enhance post-graduate qualifications, and to attract, sustain and progress women in research/academic careers.

- Develop programmes to prepare and advance women into research/academic leadership roles in research institutions/higher education, as research evidence suggests that women research/academic leaders tend to produce more access, achievement and retention of women students in STEM fields.

- Provide training workshops to disseminate information and capacity-build women researchers to encourage more of them to apply, and to enhance their success rates in various international research funding facilities and academic exchange programmes.

- The WAFIRA programme is a leading exponent incorporating all of the above good practice elements in its portfolio currently in W. Africa.
WOMEN IN TVET: STILL THE ‘CINDERELLA’ SCENARIO

Vocational and polytechnic institutes in African countries are also critical key sites for capacity development in STEM. Technologists, technicians, artisans and craftspeople are the bedrock on which small and medium-sized enterprises and businesses are founded, especially in operations and maintenance. Many African countries have made the mistake of neglecting the training of technicians, technologists and Artisans, while Technical, Vocational, Education and Training (TVET) systems have been left to operate in a parlous state. Thus, African economies are systematically undermined by the impact of this ‘double whammy’ of the lack of educated and skilled high-level STEM professionals and the lack of technician grade artisans and craftspeople.

For girls and women, the TVET sector is further challenging still, as it comes with the added baggage of ‘low societal status’ and entrenched patriarchy... hence the ‘Cinderella’ mind-set which discourages them from education and skills development in the sector. The need to link training to employment (either self or paid employment) is at the root of all the best practices and strategies observed worldwide in engendering gender equality in TVET.
Boosting female science teachers in Africa
About UNESCO–IICBA

- UNESCO–International Institute for Capacity Building in Africa (IICBA) was established by the General Conference of UNESCO in 1999.

- As the only Category One UNESCO institute in Africa, it is mandated to strengthen the capacities of the 54 African Member States in the area of teacher development in general. SMET teachers inclusive.

Teaching is the one profession that creates all other professions.

unknown
If you teach a woman, you teach a whole nation.

Aggrey of Ghana

Therefore to jump-starting girls’ interest in STEM subjects, boosting the percentage of scientists, technologist, engineers and mathematicians who are women and giving greater prominence to strong role models is not just the right thing to do, but the smart thing to do. However, several challenges are faced by member states in Africa
Challenges:

- **The lack of women scientists in high positions** is quite common in both developed and developing countries.
- **In many developing countries, women find it particularly difficult to participate in science.** Several obstacles stand in their way:
  - Negative attitudes arising from cultural and societal values;
  - Decreasing number of science and mathematics teachers;
  - Persistent use of outdated methods of teaching science; and
  - Lack of government support for promoting state-of-the-art methods in STEM education.

- **Cultural attitudes and societal values** can be a significant barrier to women’s education, especially in science.
- **Traditional roles** In some developing countries, girls cannot benefit from education at all because they are expected to stay at home and help with household chores while the boys go to school. It is normal in some families to give priority to the educational development of boys.
Early marriages: In many countries, young women and girls cannot continue their education beyond school because they are married off early and are expected to devote their lives to their husband and family.

Career stereotypes – When young women and girls are educated, they often receive no encouragement to study science and mathematics. This is because traditional beliefs dictate that these areas of study are appropriate only for males.

Need to raise a family: Even where women have more opportunities to study science, some of these women (either willingly or unwillingly) choose to end their careers in science to get married and raise a family.

Performance of traditional roles: Others simply cannot compete with their male colleagues because, in the traditional role, in which, women spend more time looking after the family.
Urgent actions needed

- **Address the teacher gap**: The UNESCO Institute for Statistics estimated that 96 countries will need a total of at least 1.9 million more teachers by 2015 than they did in 2007. **Sub-Saharan Africa** will be severely affected, with 27 of the 45 countries facing a critical gap.

- **Address Poor teaching methods**: We need to train and re-train women science teachers in effective and innovative methods of science teaching. The traditional method of teaching science, based on lectures and memorizing facts, is ineffective.

- **Providing better conditions for women in the workforce**: Promote family-friendly practices that allow women to remain in the workforce while balancing the demands of caring for their families is critical.

- **Exposé Young Girls to STEM**: Correcting the negative perceptions that girls develop at a young age can, however, lead them to embrace math and science when they reach high school, rather than avoid the subjects.
Encourage Participation in Special Programs: Conduct sensitization workshop to enlighten aspiring female scientist about the available opportunities in spite of the challenges

Support Learning Opportunities in the Community: Working through existing social groups for women

Serve as a Mentor: Mentorship dramatically helps women to reach their career goals

Take Charge and Educate: Lots of information now exist on-line to educate female teachers to improve their interest in STEM.

Tackle fallacies to promote gender equality in science:

Concerted efforts must be made to demystify science and technology, encourage the enhancement of targeted funding to the sector, promote female SMET education, build science and technology institutional and human capacity, protect and promote indigenous knowledge systems in the interest of national development.
IICBA’s Mandate and programmes

Programmes involve:

- **Technical assistance** at the country level for tailored programmes to meet countries’ specific needs;
- **Training**: Many standard setting programmes are ongoing in RECs and AUC; and
- **Research** at the continental level to provide methodological and technical support to policy-makers and generate knowledge for dissemination (see website for publication)

IICBA’s Intervention – 3 levels

- Country level consultations, workshops and/or studies
- Sub-regional consultative/training workshops at the level of RECs, networking and sharing experiences
- Regional level activities in line with the requirements of the African Union Commission and in coordination with UNESCO regional offices in Africa and the teachers’ department at HQs
Partnership

- African Union Commission (AUC), the Regional Economic Communities (RECs) and UN Economic Commission for Africa (ECA)
- UNESCO Regional and National Offices and National Commissions for UNESCO in Africa
- ADEA ad its working Group on the teaching profession and the recently graduated WGECID
- Commonwealth Secretariat
- Commonwealth of Learning (COL)
- Forum for African Women Educationalists (FAWE)
- Global e–Schools and Communities Initiatives (GeSCI)
- International Research and Training Centre for Rural Education (INRULED)
- Organisation Internationale de la Francophonie (OIF)
- Various NGOs working on teacher education and development
- Individual specialists, universities and centres of excellence in teacher education and development

New building being built by the government of Ethiopia
Women in ICT

Salwa K. Abd-El-Hafiz, Professor
Engineering Mathematics Dept.
Faculty of Engineering
Cairo University, Egypt

Laureate of AU K. Nkrumah Regional
Scientific Award for Women, 2014
Outline

- Women in ICT: Careers & Empowerment
- Economic Empowerment
- Socio-Economic Empowerment
- Political Empowerment & Human Development
- A New Gender Gap

Information and Communication Technology - ICT

- ICT includes different goods, applications and services used to produce, process, distribute and transform information.
- The ICT sector consists of segments as diverse as telecommunications, television and radio broadcasting, computer hardware, software and electronic media (e.g., Internet and email).
- New technologies such as satellite technology, mobile phones and Internet have a great potential for empowerment.
Women Careers in ICT

- Key findings of an EU survey, published in 2013:
  - Only 30% of the around 7 million people working in the ICT sector are women.
  - Getting more girls interested in a digital career and getting more women into digital jobs would benefit the digital industry, women themselves and the economy.

Digital Role Models in ICT Careers

- We need to encourage and help young people, and in particular women, to take up ICT-related careers.
- We need to highlight and celebrate digital role models who could encourage young women and girls to study and to pursue careers in ICT.
- Some Women Role Models from Egypt in ICT:
  - The Dean of the Faculty of Computers and Information
  - The Head of the Information Technology Institute
Women Empowerment

- ICT can be very beneficial for women’s empowerment through increasing their access to many economic, socio-economic, political and human development activities:
  - Health and nutrition
  - Education and training
  - Employment opportunities
  - Access of producers and traders to markets
  - Freedom of expression and privacy of communication to oppose gender discrimination and to promote women’s human rights.

Economic Empowerment

- ICT can economically empower women through the knowledge and networking tools for women as producers and distributors of goods and services.
- The ICT tools can be used to:
  - Connect women to new and wider markets
  - Broaden their social networks
  - Provide them with information that opens up important economic opportunities
Artisans Facing the Demands of Modern Markets - Egypt

- Many of Egypt’s female artisans only produce crafts and are not involved in the selling process; they receive only a small part of the profits.
- ArabDev (www.arabdev.com), an ICT organization working in Egypt, has been promoting the use of the Internet among low-income groups throughout Egypt, with a special focus on women.
- Since 1999, ArabDev has focused on ICT for development and has made ICT initiatives in Egypt in cooperation with the related government and nongovernment organizations.

Women’s Digital Baskets - Rwanda

- Two years project (2009 -2010) to bring together women’s everyday activities, with specific focus on traditional basket making and ICT.
- Documented traditional skills and knowledge of handicraft methods and products by creating digital presentations – preserving knowledge and skills and presenting them to a wider audience – that can also be used as training tool to teach and learn traditional techniques of basket making.
- Created new business opportunities (e-business).
Socio-Economic Empowerment

- ICT provides opportunities for women’s socio-economic empowerment in many areas such as health and education.
  - **Education**: To support education and training of women and girls, a combination of traditional and new ICT can be used in formal and informal learning, distance education and in establishing e-learning centers. For example, by adapting the use of computers and the Internet, radio and television.
  - **Health**: ICT can facilitate health initiatives for women. ICT has the potential for delivering locally adapted health information to women through community access points. Some successful efforts have been undertaken by health promoters to use radio and the Internet to effectively disseminate information related to women’s health, including sexual and reproductive rights and health.

A Website for Mothers - Egypt

- In 2010, SuperMama, a website offering tips and expert advice for mothers and mothers-to-be began (http://supermama.me/ar).
- SuperMama today offers advice on pregnancy, motherhood, work/life balance, and many other topics of interest to Egyptian moms.
- SuperMama has gained valuable funding, training and mentorship through several innovation competitions, suggesting that such models can be valuable drivers of homegrown content for women.
Political Empowerment & Human Development

- **ICT** can contribute to:
  - Promoting women’s rights
  - Increasing women’s networking for social and political advocacy
  - Strengthening women’s participation in the political process
  - Supporting the work of elected women officials
  - Increasing women’s access to government and its services

Using Social Media to Stop Violence Against Women - Zambia

- The Planned Parenthood Association helped to train teens on how to use social media so they can become online advocates to help stop violence against women.
- They helped train 20 specially appointed local members of society how they can help spread knowledge to stop gender-based violence.
- The training of regional educators hopes ultimately to give Zambia’s youth their own power to become human rights advocates for women.
Global Internet Access

2012: 2.4 billion Internet users globally
2015: 3.2 billion

Africa
2012: 16% penetration
2015: 28.6% penetration
Globally in 2015: 46.4% penetration

The Internet Gender Gap

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<th>Region</th>
<th>East Asia &amp; Pacific</th>
<th>South Asia</th>
<th>Sub-Saharan Africa</th>
<th>Europe &amp; Central Asia</th>
<th>Latin America &amp; the Caribbean</th>
<th>Middle East &amp; North Africa</th>
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<td>Global gender gap</td>
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<td>(144 developing countries)</td>
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Factors that Influence Internet Access for Women and Girls

The Digital Gap

- High illiteracy rates of women and girls and their lack of ICT training are two of the most serious barriers that prevent them from entering the information age.

- We must ensure that women, as well as men, at all social levels and in all countries, can access and use ICT.

- Girls and women must be supported by the policy-makers, the industry and their community in becoming technologically competitive so that they gain proper understanding of how to use ICT safely and effectively.
References

1. United Nations Division for the Advancement of Women, Department of Economic and Social Affairs, “Gender equality and empowerment of women through ICT,” 2005.
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