



INTEGRATING GENDER EQUALITY IN STEM EDUCATION:

The Role of Science Academies

**2023 Annual Meeting of
African Science Academies
(AMASA 2023)**

WEBINAR REPORT

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INTEGRATING GENDER EQUALITY IN STEM EDUCATION: The Role of Science Academies

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Abbreviations & Acronyms

AMASA	Annual Meeting of African Science Academies
GenderInSITE	Gender in science, innovation, technology and engineering
ARUA	African Research Universities Alliance
ASSAf	Academy of Science of South Africa
NASAC	Network of African Science Academies
STEM	Science, Technology, Engineering and Mathematics
UCT	University of Cape Town
IDRC	The International Development Research Centre

Objectives of the Webinar

1. To raise awareness on the status of Gender Equality in STEM Education in Africa.
2. To discuss the critical and transformational role of science academies in integrating gender equality.
3. To consider the applicability of key recommendations in the ASSAf and GenderInSITE report on *Gender Equality in African Universities* for science academies.

Welcome Remarks and Introductions

Dr. Jackie Kado, *Executive Director of NASAC*

Dr. Kado welcomed all to the virtual meeting and acknowledged the Board Members of NASAC that were in attendance. She introduced the theme of AMASA 2023 as ***“Integrating Gender Equality in STEM Education: The Role of Science Academies,”*** and its anchor publication being the South African Academy of Science (ASSAf) and GenderInSITE report titled Gender Equality at African Research Universities Alliance (ARUA) Institutions

The main objective of the meeting, she said, was to review the report and learn from the experiences of the universities to determine what value-add academies can contribute. Dr. Kado outlined the following as the specific objectives of AMASA 2023:

- (i) To raise awareness on the status of Gender Equality in STEM education in Africa. Education is key because it is the way in which academies get to retain membership and get new and young people involved in academy work.
- (ii) To discuss the critical and transformational role of science academies in integrating Gender Equality in the systems, processes and the leadership of the Academies. Most Science Academies have male presidents, with only two having female presidents currently; what is stopping female scientists to vie for the leadership positions?
- (iii) To consider the applicability of the key recommendations made by ASSAf and GenderInSITE in the report as it relates to Academies.

She looked forward to an interactive and engaging webinar. In closing, she requested participants to observe a minute of silence for the Sudanese National Academy of Sciences, whose country went into war in April 2023, with peace and stability yet to be restored. She closed by thanking all Members and Partners for attending in the meeting.

Professor Norbert Hounkonnou, *President of NASAC*

Prof. Hounkonnou welcomed all Distinguished guests, Members of the NASAC Board, Partners and Collaborators to AMASA 2023. He stated that the theme of the meeting was significant because of the shared commitment to address existing disparities and explore avenues for fostering a more inclusive and equitable environment for all in the field of Science, Technology, Engineering, Innovation, and Mathematics.

He acknowledged the dedication that resonates with the excellence of science academies. The African continent, he stated, is home to brilliant individuals, who when given the right opportunities can make transformative contributions to the world of STEM. It is therefore important to recognize and remove the barriers that hinder the full participation of women and girls in the field of science. As discussions ensue and innovative sustainable solutions are pursued, it is essential to understand the current science landscape. In many parts of Africa, gender disparities persist in STEM education – not only in classrooms, but has also escalated to leadership and professional realms. He noted that girls face challenges ranging from gender-based social expectations to inadequate resources. These challenges limit their access to quality education and impede their retention and progression in STEM careers.

AMASA 2023 is a platform that will enable members to investigate these challenges further, identify possible solutions and remedial actions and celebrate the successes that have been realized so far. The groundwork already done by the Academy of Science of South Africa (ASSAf) and GenderInSITE on this issue has made it possible to have the report as the anchor publication for AMASA 2023.

AMASA 2023 explored the systemic issues that contribute to gender imbalances in STEM, analysed problematic cultural and societal factors and proposed best practices that can be applied to bridge the gap so as to successfully empower women in Africa. It is crucial, he said, to approach these discussions with an open mind, ready to learn from each other's experiences and insights.

He expressed his appreciation for having a diverse group of experienced speakers and panellists to address the topic at the webinar, as well as the wide array of participants from across the NASAC membership and

partnership, each with a unique perspective on the issue. He urged all present to leverage this diversity towards building a comprehensive understanding of the challenges at hand and collaboratively design strategies that can enable science academies to adopt positive practices and policies toward gender parity in STEM. Indeed, although men and women have equal abilities to succeed in the same situations, specific tasks may be more suitable to either gender to advance our society of humanity. All gender roles are complementary in their diversities and differences, and all must learn to respect this. Existing stereotypes in society should concern everyone and the inclusion of women in all systems and structures of science is important. The involvement of women specifically in science and innovation is paramount.

He cited a few esteemed pioneering women in science, as listed below:

1. **Marie Curie**, a Polish Physicist and Chemist who conducted pioneering research on radioactivity and Nuclear Physics.
2. **Mileva Marić Einstein**, a remarkable Serbian Physicist and Mathematician.
3. **Emmy Noether**, a German Mathematical genius who revolutionized abstract algebra and physics.
4. **Lisa Gelobter**, a computer scientist who made significant contributions to internet technologies used in streaming and online gaming, including GIF animation techniques used in text and online messages by billions of people.
5. **Katharine Johnson**, a trailblazing mathematician, who performed the calculations that propelled NASA's spaceflight program. She notably mapped the flight of Alan Shepard – the first American to go into space in 1961.

He encouraged all participants to actively engage in the discussions during the AMASA 2023 webinar and make collective effort to pave the way for a future where gender equality in STEM education is not just an aspiration, but a reality for Science Academies. He rallied participants to empower the next generation of scientists, engineers, and innovators, regardless of their gender and thanked everyone for their continued support to NASAC. He concluded by urging everyone to make the webinar a catalyst for transformative change in every sector that is a voice in of science in Africa.

Prof. Himla Soodyall, *Executive Officer of ASSAf*

Prof. Soodyall thanked NASAC for inviting ASSAf to partner in AMASA 2023. She also thanked the President, the Board and the Secretariat of NASAC, for their continued engagement to all the member academies and at the leadership they continue to offer in the advancement of science, technology and innovation in Africa. She expressed her pleasure in ASSAf's inclusion in the Network's activities and looked forward to more opportunities for collaboration.

ASSAf developed a transformation strategy that focuses on transforming knowledge that particularly tackles equity issues in South Africa. These issues are related to the participation of women in science, how apartheid influenced the way race was conceived and run in South Africa, as well as some of the differences that are seen in the disciplinary apportionment of science. Be that as it may, race, gender, social class, and geographic location, however, continue to be an integral determinant of university access, experience, education outcomes and ultimately the neighbour market participation in South Africa. About one million students attend universities in South Africa and only 300,000 take up STEM subjects. Whilst South Africa has a higher participation and graduation of females to males, the graduation rates are higher for males than for females. Gender biases exist in disciplinary participation with about 27% of engineers being women; 70% of women studying health-related sciences and only about 47% studying other forms of science.

Despite these high levels of education, women are not equally represented in the labour market sector. Higher-skilled jobs are still racially skewed and male-dominated. Managers are still mostly white and male. Females in top positions are still predominantly white and African women remain the most under-represented in high-skilled jobs, especially in the private sector. There is a need to address the challenges in the education pipeline from primary, secondary to tertiary education. The academic landscape needs to aggressively mitigate barriers so that positive change can happen in the educational sector. ASSAf is working to change South Africa's education pipeline. ASSAf has 218 female Members out of a total of 689, representing 32% of its membership. In the last five years the representation of women in ASSAf has increased as follows; 2019–22%; 2020–28%; 2021–29%; 2022–

31% and in 2023–32%. This increment has been gradual with the gap between males and females closing in the last five to ten years. However, from the founding membership to the present, there is still no parity in the membership of ASSAf. Representation of women in its council is 50%, but expected to increase with the continued participation of women to establish committees and working groups. ASSAf continues to target its outreach activities to ensure it inspires the girls to take up science and continue their careers in the sciences. There is a country-wide roadshow organized by ASSAf, which encourages schools and science centres to promote STEM. In this digital era, digital access and literacy is highly dependent on the foundation skills of reading, writing and computing. Sadly, it has been reported that the level of literacy in grades 4–6 is regressing in South Africa.

She concluded with a quote from former South African President, Nelson Mandela, that states, *“Education is the most powerful weapon you can use to change the world.”* She encouraged participants to strive towards this and, together with other members of academies, hoped that they would collectively contribute to the vision for the betterment of STEM in Africa.

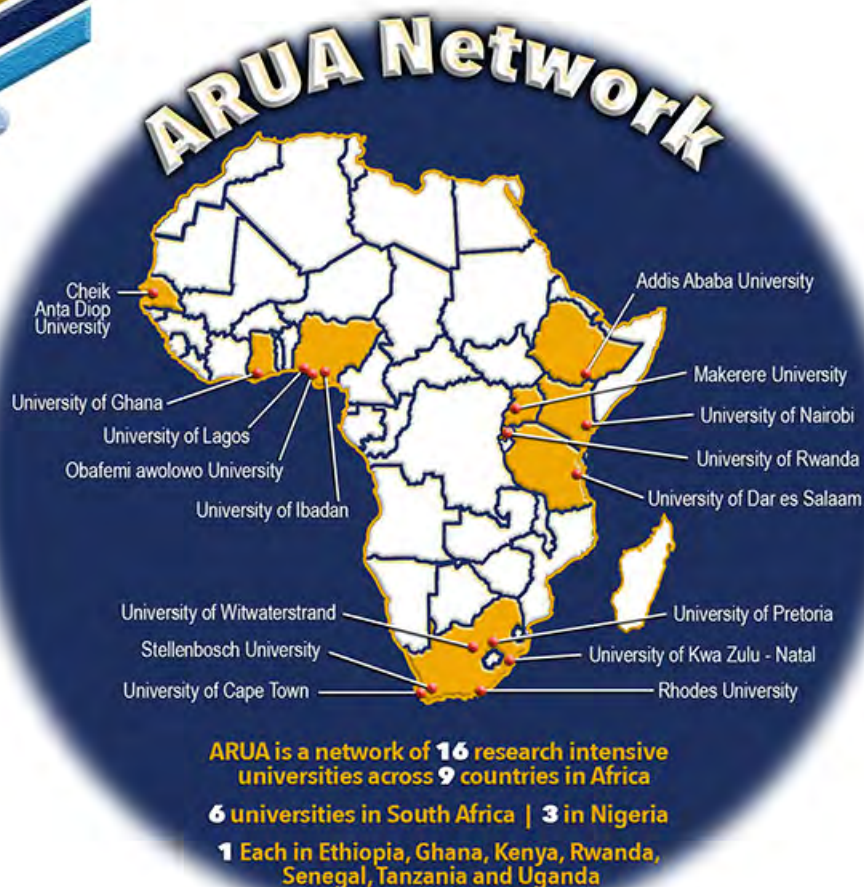
KEYNOTE ADDRESS:

Gender and STEM Education – Empowering Diversity and Inclusion in African Universities

Prof. Roseanne Diab, *Lead author of the report*

Prof. Diab thanked Dr. Kado and Prof. Soodyall for their introductory remarks. She presented the results of the collaborative GenderInSITE and ASSAf study that was funded by IDRC.

Referencing SDG 5 pertaining to the achievement of gender equality and the empowerment of women in the



Higher Education Sector, Prof. Diab stated that universities in Africa have a great responsibility to provide gender and inclusive education. In this regard, she specifically recognised the African Union *2019 Strategy for Gender Equality and Women's Empowerment* as key towards gender equality and full participation of women. The Association of African Universities, she said, has a policy document to advance gender equality amongst its members and has developed a gender mainstreaming toolkit and focused its attention on STEM disciplines.

It is against this background that the research project sought to utilize the framework of the African Research Universities Alliance (ARUA) which are Africa's most research-intensive universities to see how they are faring in respect of gender equality. The overall aim was to look at the efforts and highlight the successes of the ARUA institutions, and tackle barriers to the full participation of women faculty members in STEM fields and in university leadership.

The specific objectives of the study were to:

- Evaluate gender-related institutional policies and structures.
- Gather statistics on women in senior leadership.
- Document lessons learned and best practices.

The three-year research project was conducted during the COVID-19 Pandemic, which led to a number of challenges, and employed the methodologies below:

(i) Desktop information gathering on policies from university websites

This was possible for 15 of 16 institutions with Cheikh Anta Diop University (UCAD) being excluded due to lack of information on their website.

(ii) Online questionnaire

This targeted both men and women in senior leadership in 15 of the 16 institutions. These were distributed in 8 universities where ethical clearance was obtained, with 6 being in South Africa, 1 in Ghana and 1 in Rwanda and yielded 46 responses, with 24 being from men.

(iii) Key informant interviews

This involved development of two separate semi-structured interview protocols. One targeted Vice Chancellors and the other

targeted senior leadership, i.e. Deans & above. There were 64 interviews in all with 37 being with men and 27 with women.

Gender-related policies

ARUA does not have a Gender Policy and a strong recommendation was made to them for the need to show leadership in Africa and introduce a Gender Policy. Eight ARUA universities have Gender Policies with the one in the University of Cape Town, South Africa, still under development. South African universities have tended to opt for an alternative policy generally known as an Anti-Discrimination Policy, which stems from the country's apartheid history. This focuses predominantly on race, but it does include gender as a key element to the benefit of women.

The key findings and conclusions from the study of ARUA included:

- The absence of a standalone Gender Policy, which means that there is no aspirational policy at the university to address elements such as gender mainstreaming, the collection of gender-disaggregated data, gender budgeting, gendering the curriculum, and the application of a gender lens in research. This was addressed with the recommendation that gender policies be introduced in universities. The same would apply to all Science Academies as well.
- 14 ARUA institutions have dedicated sexual harassment policies in place, with others introducing additional policies e.g. a bullying policy.

Leadership profile at ARUA institutions

Change in the leadership profiles at ARUA institutions is quite frequent and the gender breakdown as of October 2022 is highlighted below:

- **The Chair of Council:** 43% were women and some efforts have been in place to obtain gender parity.
- **Vice-chancellors:** 13% were women, with only the University of Cape Town and University of Ghana having female VCs.
- **Executive leadership team:** This ranged from a low of 25% at the University of Dar es Salaam to a high of 75% in Addis Ababa University. In four universities women representation was 50%

or above i.e. the Addis Ababa University, University of Ibadan, University of Pretoria and University of Witwatersrand.

- **Deans' profiles:** This ranged from zero females at the University of Ghana and the University of Witwatersrand, to 63% at the University of Cape Town which was the highest and the only one with more than 50% representation of women amongst the Deans. Female representation in the majority of universities lay below 30%.

Online Survey

The online survey instrument used was applied to only eight universities where ethical clearances had been obtained. Of these, only six universities participated, with no responses received from the University of Cape Town and the University of Pretoria. Responses to some of the key questions in the survey were as below:

- ***“What are the factors that played a role in ascension of women in leadership positions?”***

This question was answered only by women. They ranked their competency first. 16 women said that competency was a key factor that played a role in their ascension to their leadership position. They ranked experience second and stated that university policy was not seen as a contributing factor in attaining their leadership positions. This showed that women are very confident of their abilities, competent and experienced as well.

- ***“What were the obstacles to increasing women in the leadership positions?”***

There were marked differences in the responses from men and women. Men cited a few obstacles as:

- (i) The lack of suitably qualified women.
- (ii) Reluctance by women to take on leadership positions.
- (iii) Socio-cultural belief systems.

Obstacles as reported by women were mainly:

- (i) Institutional culture that favors men over women.
- (ii) Unconscious biases.

- (iii) Poor networking opportunities.
- (iv) Poor implementation of family-friendly policies
- (v) Socio-cultural belief systems.

Key informant interviews

There was a total of 64 participants¹ in the interviews and the findings were wide-ranging. Some of the responses were categorized under headings as below:

1. Dealing with gendered micro-aggressions

Views of both men and women were gathered on this topic. Although there were no questions in the semi-structured interview protocol on gendered micro-aggressions, when asked whether they had ever experienced sexual harassment, 3 women reported affirmatively to having experienced explicit sexual harassment in the traditional physical sense i.e. touching or rape. The experience of micro-aggressions emerged spontaneously in interviews with women leaders, and it was found that these subtler micro-aggressions were very prevalent and that the impact was more damaging and much harder to be addressed by policy documents.

There was a stark contrast between men's and women's understanding of gendered micro-aggressions. Women better understood the issue while men's views varied widely with many being perplexed or ignorant of what it involved. The study acknowledged that the universities have taken significant steps to eliminate sexual harassment through policies and various structures; the key question is whether this is enough since the policies are not adequately addressing these gendered micro-aggressions.

A few issues raised by the voices of the women academic leaders were:

- Assumptions of traditional gender roles e.g. being asked to make tea or take minutes.
- Women having to navigate the patriarchy as "universities are hostile places for women".

¹In-depth Interviews (IDs) - 37 men and 27 women from eight universities

- Sexual objectification of women by their male colleagues.
- Dealing with self-doubt – unsure whether the matter was a joke or their imagination.
- The trivialising of gender issues through humour by men to detract from the importance of the issue.
- Reluctance to report arising issues due to traumatic reporting process and an unhelpful Human Resources department.
- Invisibility due to difficulties in raising their voice amongst all the men and the tendency by males to repeat something a woman said while taking ownership of the point.

Even though the impact of the micro-aggressions on women was varied in that individual women react differently at different times depending on their state of mind, the resulting realities were reported as to include:

- Exhaustion from dealing with the issue.
- Frustration with the resulting lack of focus on work.
- Withdrawal due to feelings of a lack of comfort when in those spaces.
- Resilience development as a coping mechanism.

2. Working Conditions for Women

There is need for a narrative shift from ‘women with children’, to ‘men and women with families’ to avoid stereotyping. Flexibility is very useful for women in their careers but often, this is not entrenched in policy and is dependent on management as to whether and how it is implemented. Childcare facilities on university campuses were lacking and issues of personal safety were particularly rife for women in STEM disciplines, especially in the field of sciences and the health sciences where they work offsite.

3. Career Progression

Career bottlenecks found were that progress up to senior lecturer level was achievable but getting beyond that was a struggle for both men and women. Women however tend to be more impacted because of more responsibilities at home and their investment in teaching and socially responsive work and not less so in research. The overall

recommendation was to provide women with dedicated research time to level the playing field as an equity factor, and also the need for a criteria change or the support of women to meet the criteria.

4. Culture

(a) *Institutional culture*

This was described as the prevalent “macho culture” or “patriarchal culture” in the universities characterised by pockets of toxic masculinity. This affected women’s sense of belonging and made universities hostile environments for women. “Residential culture” was also present in the institutions and this related to the abuse of alcohol. A finding of the study was that some universities have undertaken culture surveys.

(b) *Societal culture*

This involved the entrenched perceptions of the roles of men and women.

5. Mentorship

It emerged that there was a critical need for mentorship at the universities, especially for women because many examples of mentoring programmes are not necessarily targeted at women.

Some recommendations made were:

- Creation of a gender policy where none exists to assist with gender mainstreaming.
- Conducting a gender audit.
- A sexual harassment policy to combat cases of gendered micro-aggressions.
- Address sexual diversity in the universities.
- Address institutional (patriarchal) culture.
- Address mid-career blockages.

Conclusion from the study

Universities have got critical and transformational roles to play in the promotion of gender equality. The students that go through university can become advocates in the society. Universities must be the leaders in gender transformation, and this will translate into gender transformation at Science Academies as well. Gender transformation in African universities lags far behind the universities in other parts of the world and this can be resolved by addressing the key issues raised in the report on *Gender Equality at African Research Universities Alliance (ARUA) institutions*.

Prof. Diab concluded by thanking IDRC, Canada for funding the report, the ASSAf and GenderInSITE staff for undertaking the study, the focal points at the participating universities who assisted in gathering the information for the online survey and the respondents to the online survey instrument together with the key informants at participating universities.

The following were the key discussion points raised by participants after Prof. Diab's presentation.

- ***Human Resources should be equipped to deal with cases of both harassment and sexual harassment in a way that make sense for both men and women in science.***

Even though most universities have gender officers and structures in place that deal with sexual harassment, it was found that they were not equipped to deal with gendered micro-aggressions. The reporting line process was often a frustrating experience due to long delays or the lack of empathy of the officers.

It was recommended that Gender officers need to expand their mandate to include the subtler biases and gendered micro-aggressions. Also, the creation of safe spaces where feelings and experiences can be shared between men and women on campus will help bring about conversation and promote awareness about gendered micro-aggressions, because men are sometimes unaware of it.

Prof. Diab clarified that all the universities included in the study have many faculties, e.g. humanities, engineering, science, medicine and that they were not only scientific technology universities.

PANEL DISCUSSION

The session objective was for panelists to provide a brief update on the status of Gender Equality in STEM education in Africa, including key recommendations and recent interventions.

MODERATOR:

Prof. Olubukola Babalola

Vice President TWAS and OWSD – Africa

PANELISTS:

Dr. Fred Kofi Boateng

University of Ghana

Prof. Madeleine Mukeshimana

University of Rwanda

Prof. Josephine K. W. Ngaira

Masinde Muliro University of Science & Technology

Prof. Francisca Nneke Okeke

University of Nigeria, Nsukka

Prof. Samia Benabbas Kaghouché

Algeria Academy of Science & Technology

Prof. Habiba Bouhamed Chaabouni

*Tunis Elmanar University & Tunisian Academy of Sciences,
Letters and Arts*

GENDERINSITE REPORT:

An Overview on the Status of Gender Equality in African University Faculty and Leadership

Dr. Fred Kofi Boateng, *University of Ghana*

In all the upper echelons of higher education institutions, women are disproportionately under-represented and get the less secure jobs and leadership positions compared to their male counterparts. Despite the strides made in gender inclusivity and empowerment in the continent over the decades, various literature points to systemic, structural, institutional, cultural, social and curricula impediments that still exist. These have hindered the ascension of women into leadership and their participation in STEM. In Ghana, only three universities have female Vice-chancellors², less than 10% in Deanship positions, with the Executive leadership team at the University of Ghana comprising 50% women post-2021.

There have been several initiatives in public universities to improve female participation and gender mainstreaming levels, e.g. the case in the University of Ghana; the advancing of women towards STEM leadership in Kenyan universities; and the set-up of a Leadership Academy at the University of Ghana to train prospective leaders while considering the component of gender equality especially inclusion. The key challenge, however, is that, even though the gender mainstreaming policies are in place, they have not been coordinated on a multi-stakeholder level. There needs to be a system where all the stakeholders, beyond the higher education system, are brought to the table having in mind gender stereotypes, disparities, and norms. Systemic as they are, common evaluative instruments need to be produced, reinforced, and embedded systematically and through social interactions. This approach should be done in a way that creates accountability and commitment amongst all relevant stakeholders.

²The University of Ghana has ensured that 50% of female's form part of the Executive leadership team, post 2021.

Prof. Madeleine Mukeshimana, *University of Rwanda*

During the 2022 academic year, the University of Rwanda had 31,506 students with 2,058 in the master's program and 324 in directorate programs. The university operates in 6 independent self-governing colleges on 8 campuses. In 2022 a report conducted on the gender equality status at the University of Rwanda illustrated gender numbers as below:

- **Academic staff:** Out of a total of 1,333 academic staff, 24% are female and 75.3% are male.
- **Professors:** 1.4% are female and 5.4% are male.
- **Lecturers:** 5% are female and 19% are male.
- **Colleges:** All six are headed by males.
- **Centre's of excellence:** Out of a total of ten, only one is headed by a female.
- **Schools:** Out of a total of 21 schools, less than five schools are headed by female.
- **Board of Governors:** Out of a total of 19, only six are female.
- **STEM graduates:** In 2023, out of the 57% STEM graduates, 34.7% were female while 65.2% were male.

Following conducting a survey in 2020, some barriers hindering females at the University of Rwanda (UoR) to attain academic positions were:

- Females in the University of Rwanda are still under-qualified. Most have master's and bachelor's degrees but very few have PhDs.
- The existence of gender and cultural biases, and stereotypes e.g. beliefs that Rwandan women should not have competitive personalities.
- Work-life balance issues.
- Lack of Self-confidence.
- Lack of motivation or role models.
- Lack of mentorship and networking opportunities.
- Gender pay-gaps due to the lack of attainment of top leadership positions.
- Limited access to research funding.

NASAC WOMEN FOR SCIENCE (WfS) WORKING GROUP:

The Ideal Strategy for Adapting Gender inclusivity in STEM Education (Challenges & Strategies for Gender Inclusivity)

Prof. Josephine K. W. Ngaira, *Masinde Muliro University of Science & Technology, Kenya*

Introduction

Gender equality in STEM education fosters diversity and inclusion, it leads to more innovative solutions to societal challenges, it closes the gender gap in STEM and addresses skills gap in the labor market.

Gender inclusivity in STEM education has experienced many challenges, for example, only 28% of the global workforce in STEM industries is women and in Africa, 33% of researchers in STEM were women, and only 35% of female students were in STEM related fields (UNESCO, 2018).

However, some strategies and interventions have been proposed to mitigate this crisis.

Challenges of fewer women in STEM

- (i) **Culture:** Some exclude women from formal education. These are especially cultures that practice Female Genital Mutilation (FGM) and who consider education qualification as circumcision and marriage.
- (ii) **Male dominated culture that stereotypes women's intellectual capacity in science subjects:** e.g. "Women cannot do Maths, Physics or Engineering".
- (iii) **Lack of role models for young girls in education:** There are very few women up in the science, academic and employment ladder because many families only began taking girls to school in the recent past, but boys were always given priority in receiving an education.

- (iv) **Demanding nature of STEM careers:** This is especially experienced in engineering and medicine fields, making it difficult for women to balance them with equally demanding family responsibilities, therefore, they shy away from studying science subjects in school, leading to avoidance of science related careers in colleges/ universities.
- (v) **Male dominated managers in HR departments:** Top managers are mostly male who sometimes ask for impossible favors from women to get employed – a factor that discourages women from seeking jobs in such industries, therefore creating an imbalance.
- (vi) **Hostile environment for women in STEM activities:** This includes discrimination, harassment, and frustration especially in male-dominated STEM activities, resulting in most women shying away and creating a gender inclusivity gap.
- (vii) **Bias in science subjects offered in schools:** Most high schools for girls in Africa offer art and social science-related subjects while the high schools for boys emphasize on and offer STEM-related subjects creating disparity between Men and Women numbers in STEM education.

Strategies and Recommendations:

- Change gender stereotyping by highlighting achievements of women in STEM. This approach will encourage young girls to engage in STEM.
- Provide equal opportunity in learning, work environment, and leadership. There is need for Africa to deliberately have 50% of girls' high schools specializing in STEM-related subjects.
- Ensure that 30% of universities offer STEM-related degrees and have several girls-only universities offering STEM degrees in each of the African countries. For example, in Kenya there is only one girls' university offering STEM-related degrees. It is called Kiriri Women University of Science and Technology.

Recent Intervention

Global campaigns against FGM (Female Genital Mutilation) by all African governments and non-governmental Organizations which has increased the number of girls from those cultures going to school.

Conclusion:

Need for empowering the boy child so that he appreciates the role of the girl child in socio-cultural and economic development. Both genders should complement each other in all forms of development.

NASAC SCIENCE AND TECHNOLOGY EDUCATION (STEP) WORKING GROUP:

The Role of Academies' Leadership in Championing Gender Equality Advocacy

Prof. Samia Benabbas Kaghouche, *Algeria Academy of Science & Technology*

Although female teachers are under-represented in STEM-related subjects at universities in Algeria, the number of women taking STEM-related subjects up to the master's level is higher than men. Despite this, women are still overlooked when it comes to scientific careers because Algerian universities prefer men to women due to social, economic, and family reasons.

She cited an article published in 2018 titled "Paradox in Gender Equality" cited Algeria and Tunisia as the best examples in Africa for gender equality in STEM. The Algerian Academy of Science is comprised of 25% women representation, with 35% of these occupying administrative posts. She urged NASAC to prioritize the creation of science academies in countries where none exist by supporting those countries and thus promoting women scientists in Africa.

Recommendations

1. Capacity building programmes to promote STEM in African countries.
2. Capitalize on the NGO influence for the promotion of teaching STEM-related subjects.
3. Science academies should support and embrace women scientists.
4. Establishment of SDGs in partnership with UN.

Women representation in all sectors remains low all over the world, making true the common saying “Do as I say, not as I do”, especially in academies of science. Female representation at the Tunisian Academy of Science is 17%, with representation in the science department being 18%. Interestingly, in the French National Academy of Medicine, women representation was found to be less than 10%.

Gender integration in the national science academies, she suggested, may not be the best model for scientific female integration/empowerment. She stressed that women’s representation in the academies of science should not be an obstacle to their playing an important role in strengthening the scientific education of females, championing gender equality in STEM education and activities, and becoming role models. Additionally, female members in African science academies should work together through NASAC to empower and strengthen female STEM education. All academies can report and run some studies that are based on national statistics as a reference for decision-makers to demonstrate, for example, the low percentage of scientific women in high positions and strategic roles.

Case Examples (2019):

- The World Bank ranked Tunisia as the 2nd highest country in the world in the percentage of female graduates from scientific (STEM) fields and higher education levels.
- The UNESCO Sciences Institute reported female representation to be 58% of graduates from scientific fields; 65% of undergraduate students; 69% of doctors; 60-70% of working engineers and doctors; and 25% of the lab research directors.

Some of the reasons attributed to the successes in Tunisia are:

- A widespread education campaign following the attainment of independence, for school attendance for all children despite their gender.
- Gender parity ratios at birth.



Key Session Takeaways

- Systemic impediments hamper women's professional growth.
- Under-representation of women in positions of authority.
- Insignificant number of female professors.
- Presence of stereotyping and sexual harassment.

Discussion Session

The following were the key discussion points:

- Finding a balance in the change in criteria for increased women's participation in STEM by being more holistic and less focused on research to level the playing field and enable the advancement of women in their careers, because this has been an obstacle to women who are greatly impacted by the time factor.
- Addressing non-recognition and non-acknowledgement of women researchers for their contributions at their universities or various positions.
- The mitigation of gender mainstreaming inadequacies and inequalities by conducting a system-wide mainstreaming for university units and science academies. Universities can also differentiate scoring systems to address imbalances and promote outreach programmes e.g. in Engineering faculties, to attract more females.
- Increase the number and visibility of female role models in science for girls and women in schools, universities, science academies and individual countries in Africa. Male role models that address female issues should be highlighted as well.
- The creation and participation of women in networks to enable them take the necessary action(s) through the networks, which act as strategic places through which socio-cultural issues can be addressed.
- Identification of the most effective approach to educate young people on STEM from primary school level by the NASAC Science and Technology Education Programme (STEP) Working Group.
- A shift in perception of gender roles in the society to promote the uptake of responsibilities e.g. males taking up increased roles in domestic assignments.
- Advocacy by science academies and the NASAC Science & Technology Education Programme (STEP) Working Group for the integration and promotion of gender equality in STEM education.

Call to Action

Besides Universities:

1. All science academies and universities in Africa should have gender policies.
2. Academies should also setup a gender office to streamline and deal with gender-related issues.

Closing Remarks

Professor Norbert Hounkonnou, *President of NASAC*

The President thanked the speakers, panelists, and participants for attending the AMASA 2023 and for the enriching discussions. He urged all participants to ensure that the recommendations from the meeting are implemented by their respective science academies and institutions. He reiterated that NASAC will play its role regarding the recommendations. He challenged all participants to play the motherly role of transforming and changing the narrative and taking concrete actions on the highlighted issues and communicate the same to their local communities, NGOs, policymakers, and all compartments of society.

Vote of Thanks

Stella Makena, *NASAC Programme Manager*

On behalf of the NASAC team, she thanked:

- The NASAC leadership, being the President of NASAC and members of the NASAC Board, for participating in AMASA 2023.
- The Academy of Science of South Africa (ASSAf) and GenderInSITE for providing the anchor publication for this event being Prof. Soodyall, ASSAf Executive Officer and Prof. Roseanne Diab.
- NASAC's partner, the Inter-Academy Partnership (IAP), for their commitment and support that has facilitated the continued gathering of academies to deliberate on pertinent and sometimes pressing thematic issues in Africa.
- All speakers, panelists, and moderators of AMASA 2023 for their invaluable insights.
- All NASAC members, who have continued to provide resources and the audience to several NASAC activities including AMASA 2023.

She closed by inviting members and partners to attend AMASA 2024 in person, to be hosted by the Algerian Academy of Science and Technology (AAST).



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The Network of African Science Academies (NASAC)

was established on 13 December 2001 in Nairobi, Kenya and is currently the affiliate Network for InterAcademy Partnership (IAP) in Africa.

NASAC is a consortium of merit-based science academies in Africa that aspires to make the “voice of science” heard by policy and decision makers within and outside the continent. NASAC is dedicated to enhancing the capacity of existing national science academies and champions in the cause for creation of new academies where none exist.

As of February 2024, NASAC comprised of the following thirty (30) members:

African Academy of Sciences (AAS)
Algerian Academy of Science and Technology (AAST)
National Academy of Sciences, Arts and Letters of Benin (ANSALB)
Botswana Academy of Sciences (BAS)
The National Academy of Sciences, Arts and Letters of Burkina Faso (ANSB)
Burundi Academy of Sciences and Technology (BAST)
Cameroon Academy of Sciences (CAS)
National Academy of Sciences and Technologies of Congo (ANSTC)
Congolesse Academy of Sciences (ACCOS) Democratic Republic of the Congo
Academy of Sciences, Arts, Cultures of Africa and African Diasporas (ASCAD), Cote d'Ivoire
Academy of Scientific Research and Technology (ASRT), Egypt – *Provisional Member*
Kingdom of Eswatini Academy of Sciences (KEAS) – *Provisional Member*
Ethiopian Academy of Science (EAS)
Ghana Academy of Arts and Sciences (GAAS)
Kenya National Academy of Sciences (KNAS)
Madagascar's National Academy of Arts Letters and Sciences
Mauritius Academy of Science and Technology (MAST)
Hassan II Academy of Science and Technology in Morocco
Academy of Sciences of Mozambique (ASM)
Nigerian Academy of Science (NAS)
Rwanda Academy of Sciences (RAS)
Academy of Sciences and Techniques of Senegal (ANSTS)
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Sudanese National Academy of Science (SNAS)
Tanzania Academy of Sciences (TAS)
National Academy of Sciences, Arts and Letters of Togo (ANSALT)
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