

Strengthening STEM curricula for girls in Africa, Asia and the Pacific

A Malaysia-UNESCO/IBE Cooperation Programme



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Acquiring knowledge about **science, technology, engineering and mathematics (STEM)** is not only a basic human right, but also a critical condition for sustainable development and participatory citizenship. Women's engagement with science and technology not only stimulates innovation, but also benefits their domestic and community work —agriculture, cooking, water, sanitation and healthcare—.

However, across the world, statistics show relatively low levels of female participation in STEM throughout schooling and employment. In Africa, Asia and the Pacific, women comprise only 33% and 18% of researchers, respectively.

In this area, the success of **Malaysia** is salient: in the country, women constitute more than half of the student population in higher education for technology, and high percentages of the professional ICTs sector. As the UNESCO's global Centre of Excellence in Curriculum, the **International Bureau of Education (IBE)** will collaborate with Malaysian expertise to strengthen STEM curricula, teacher education and assessment for girls and women in Indonesia, Kenya, Nigeria and Zimbabwe.

The Role of Curriculum and the IBE

Gender-inclusive STEM curricula that are consciously designed are critical to inspire needed change in mindsets, cultures, policies and practices across societies and to foster female engagement with STEM, by:

- Emphasizing the practical, social, environmental and global objectives of STEM
- Transforming pedagogy to allow for hands-on engagement of students, self-learning and collaboration
- Making available a repertoire of practices across gender, race, culture and social dimensions

As the global and technical leader in curriculum design and development, the International Bureau of Education (UNESCO IBE) is exceptionally positioned to help Member States operationalize gender-responsive STEM and ICT policies through the curriculum.

Overall Goal/Objectives

The development goal of the project is to increase female knowledge and engagement in STEM through the creation of gender-responsive STEM education for Member States in Africa, Asia and the Pacific.

The overall objective is to strengthen the regional and national capacities of Member States in Africa, Asia and the Pacific for the development and implementation of gender-responsive STEM curricula.

The specific objectives include:

1. To ascertain the competencies required for the STEM fields in order to design and develop quality, inclusive and holistic curricula for STEM education.
2. To create safe, enabling and gender-responsive learning environments for girls, aimed at eliminating discrimination within STEM education.
3. To mainstream gender into STEM curriculum development and teacher education.
4. To build national capacities for the counselling of adolescent girls to continue learning in STEM subjects and enter into STEM careers.
5. To foster information exchange and promote South-South cooperation in girls' education, especially with respect to STEM and computer science curricula, pedagogy and assessment.
6. To mobilize resources and develop co-financing opportunities towards Phase II of the project which will focus on the development of regional curriculum guidelines and teacher training.

Beneficiaries and Stakeholders

The target groups and beneficiaries of the project are curriculum developers/specialists; national policy-makers; teacher educators; teachers; administrators; inspectors; school leaders; academics and research communities; parents; community-based educational providers; NGOs; national media outlets; and other partners specializing in STEM education in Indonesia, Kenya, Nigeria and Zimbabwe. A total of 50 direct beneficiaries are expected from each country.

The indirect beneficiaries are the Malaysian Ministry of Education; national education systems and learners in Africa, Asia and the Pacific; curriculum design institutes; teacher education institutes; and civil society.

Implementation Strategy

The project will be implemented across four main phases of activities through a highly contextualized approach, but guided by a framework that promotes South-South cooperation through knowledge sharing across countries and regions:

1. Collaboration with national teams;
2. Knowledge creation, dissemination and advocacy;
3. Development and support;
4. Evaluation and dissemination.

Sustainability and Exit Strategy

The project develops the capacities of curriculum institutions in Africa, Asia and the Pacific through:

- integrating normative policy guidance for STEM curricula and pedagogy;
- training a wide range of stakeholders in curriculum design and implementation, thereby fostering a critical mass will be fostered that can continue to train other educators in the future.
- providing STEM curricula, media toolkits and the STEM and ICT Curricula Information Network to national ministries for their continued use.

At the end of each year, a participatory evaluation of the project will be conducted.

In its Phase II, the project will be scaled up regionally. Greater focus will also be placed upon gender mainstreaming through teacher education, the development of teacher training modules, and capacity development for the implementation of gender-responsive curricula.

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UNESCO International Bureau of Education

The International Bureau of Education is an intergovernmental organization that operates under the United Nations Educational, Scientific and Cultural Organization (UNESCO). Its core mandate is to provide all 195 Member States and Associate Member countries with the support necessary to build robust and resilient education systems that can provide high-quality education and effective learning opportunities to all learners throughout life.

The IBE's programmes and activities centre upon innovative solutions and assistance to governments in responding to the challenges they face in their education systems. More specifically, the IBE's areas of expertise are those that most directly impact the quality of education, such as the curriculum, learning and the assessment of learning.

Since its creation in 1925, the Institute has collaborated with most of UNESCO's Member States and has striven to provide them with high-level expertise and services tailored to their needs.