

UNESCO warns: A future without women in STEM is unsustainable



Rovani Sigamoney presents concrete strategies ranging from early education to exclusive funding for female researchers

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Despite decades of initiatives and programs, women still represent **less than 28% of the global workforce in science, technology, engineering, and mathematics (STEM)**.

During a talk organized by [Tec de Monterrey's](#) School of Engineering and Sciences, **UNESCO engineering and chemistry program** specialist **Rovani Sigamoney** said that **it will take more than a century to close this gap** at the current rate.

According to the [World Economic Forum](#), it will take **123 years** to fully close the global gender gap. Latin America and the Caribbean are leading the way with a **projected 52 years, she said.**

However, Sigamoney points out that this progress is not reflected in STEM careers, a reality she calls “*not only unfair, **but also unsustainable.***”



According to the World Economic Forum, it will take 123 years to completely close the global gender gap. Photo: AFP

The cost of exclusion

The lack of representation of women in STEM disciplines is not only a matter of equity but also an **economic problem** with quantifiable consequences, said the UNESCO specialist.

*“Closing the gender gap is not only a good cause **but also a smart investment,**” Sigamoney said.*

*“Studies have shown that research teams with gender diversity produce **more innovative solutions.** Every dollar spent on female education gives a return of up*

to five dollars."

According to research conducted by [McKinsey](#) and the [World Bank](#), closing this gap could add **trillions of dollars** to the global economy.

However, women still hold only **12% of management positions in STEM careers**, compared to 27.5% in non-STEM sectors.

Latin America: The striking contradiction

Sigamoney said that Latin America has made **significant progress** in gender equality overall: **more women than men** are accessing **higher education**, and female enrollment in universities doubled from 25% to 60% between 2000 and 2018.

According to Sigamoney, although emerging technologies are critical to the future, **women** represent only **26% of employees** in the data and **artificial intelligence** sector, **15% in engineering**, and **12% in cloud computing** worldwide.

Argentina, Brazil, and Mexico are among the countries with the highest percentages of women in technology and artificial intelligence worldwide.

Sigamoney highlighted that stereotypes established before adolescence limit girls' career aspirations. Photo: AFP



The problem begins at age eight

A very revealing finding that has reoriented UNESCO's strategies is that **children make decisions** about their **future careers much earlier than previously thought**.

*"Studies have shown that young people make decisions when they are **eight or nine years old**, deciding what they want to do and what careers to pursue, and it's possible that at that point they do not have all the information,"* said the specialist.

UNESCO's first engineering report in 2010 documented how stereotypes are formed from an early age: when children were asked what an engineer was, most imagined **"an older man with a white helmet and overalls."**

These **stereotypes**, established before adolescence, **limit girls' career aspirations** even before they begin considering college options, Sigamoney said.

"Closing the gender gap is not only a good cause but also a smart investment." - Rovani Sigamoney

UNESCO has identified critical areas for intervention based on evidence of what works and what doesn't:

- Policy reform

Currently, although 68% of countries have STEM policies, only half include specific components to support women and girls. Policies must integrate a gender perspective from the outset.

- Early education

Introduce STEM education through hands-on experiments starting in elementary school, when children are still forming perceptions of which careers are “right for them.”

- Data breakdown

Develop robust systems to collect gender breakdown data across all STEM disciplines in order to identify where dropouts occur and intervene.

- Structured mentoring

Regular mentoring programs that connect women at different stages of their careers, especially at critical moments such as graduate school and the transition to research positions.

- Institutional goals

Set measurable goals for hiring and promoting women in universities, technology companies, and research institutions.

- Institutional support

Real support infrastructure that includes childcare services, equitable parental leave policies, and workplace flexibility.

- Exclusive financing

Specific research funding for female scientists recognizes that they face additional obstacles when competing for resources.

According to UNESCO, children make decisions about their future careers much earlier than previously thought. Photo: AFP



The challenge of the future

By 2050, although many of today's jobs will have become obsolete, careers in science, technology, engineering, and mathematics will grow exponentially, especially in **cloud computing, artificial intelligence, and data analysis**, said the specialist.

Sigamoney said that the United Nations' 17 [Sustainable Development Goals](#) need STEM professionals for each goal, from climate action to clean energy.

"Engineers and STEM professionals are seen as problem solvers who can change the world," Sigamoney said.

"We need them as legislators, we need them in government, we need them everywhere."

However, Sigamoney points out that without the full participation of women, who represent 50% of available talent, the world is facing these global challenges with only half of its capacity.

For her, the question is no longer whether societies can afford to invest in women in science, technology, engineering, and mathematics but whether they can afford not to.

Edna Lisdeth Viveros, professor of Sustainable Technologies and Civil Engineering at the Tec, said that Sigamoney's talk connects with her decades-long legacy of opening opportunities for women in engineering and promoting inclusive and sustainable STEM education.

"Listening to her inspires our community to strengthen its commitment to equity and innovation. Her leadership at UNESCO shows that engineering is key to transforming societies with social justice and sustainability," she said.

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