BRITISH COUNCIL

Girls in STEM

# Gender imbalance

## in Digital Contexts and Its Impact on the Development of Boys and Girls

_2023

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This publication was commissioned by the British Council in Brazil as part of the Girls in STEM project, an initiative developed by the British Council to empower teachers and educators to challenge stereotypes and inspire girls to engage with STEM subjects, encouraging them to pursue careers in STEM fields. Throughout the two editions of Girls in STEM we engaged with 42 projects from 43 institutions across the five regions in Brazil, reaching over 11,630 girls.



The views expressed are the responsibility of the authors and do not necessarily represent those of the British Council.

We support peace and prosperity by building connections, understanding and trust between people in the UK and countries worldwide.

We work directly with individuals to help them gain the skills, confidence and connections to transform their lives and shape a better world in partnership with the UK. We support them to build networks and explore creative ideas, to learn English, to get a high-quality education and to gain internationally recognised qualifications.


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Gender Imbalance in Digital Contexts and Its Impact on the Development of Boys and Girls
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# Reader's Letter

**The recognition of talents and the empowerment of individuals to realise their potential resonates across different life stages and social spheres.**

**Addressing diversity and devising strategies to streamline access and opportunities form a fundamental pillar toward a societal model that aspires to sustainable development across economic, social, environmental, and human spheres.** The **British Council's Women in STEM** programme comes as one such strategy, contributing to the universe of women and girls in STEM, encompassing science, technology, engineering, and mathematics.

The Women in STEM programme is part of the Going Global Partnerships Programme. Through this initiative, we aim to build stronger, more inclusive, and internationally connected higher education systems. This involves fostering partnerships among universities, policymakers, civil society, and strategic partners in the United Kingdom and worldwide.

The Women in STEM programme aims at strengthening capacities and connections among women and girls, both at the individual and institutional levels, spanning the Americas and the UK. Its primary objective is to bolster leadership and gender diversity initiatives within the STEM environment. **The programme believes in the power of networks to develop capacities and foster transformation, strengthening the three fundamental pillars of Inspiration/interest, Performance, and Recognition.**

A systemic approach, articulated among the different stakeholders, serves as the foundational step toward progress on the journey of transformation and accomplishment. We keep strengthening partnerships between Brazil and the UK, leveraging the opportunity to glean insights from diverse contexts. This collaborative effort is dedicated to addressing different challenges with a perspective centred on inspiration, essential to paving the way for girls and women in the field of science.

**Diana Daste,**
**Head of Cultural Engagement of the British Council in Brazil**

# Summary



# Gender Imbalance in Digital Contexts and Its Impact on the Development of Boys and Girls

The **STEM Girls: Educating Future Scientists** programme, developed by the **British Council** as part of the **Women in Science Programme** , an initiative of the **Going Global Partnerships**, is the outcome of a collaborative effort involving the **STEM Education Hub** (a partnership between the British Council and King's College London), along with the **Museu do Amanhã** and the **Fundação Carlos Chagas** as implementers in the 2021 and 2022 editions, respectively.

Over the course of 2021 and 2022, the programme aimed to contribute to the discourse surrounding gender inequality in the field of science. It provided both technical and financial support for initiatives geared towards fostering the interest, participation, and education of girls in careers related to science and technology, where women continue to be underrepresented.

# The gender imbalance in current learning contexts

**THE FUTURE OF WORK IS UNDERGOING A TRANSFORMATION.**

**Existing jobs are evolving, and new ones are emerging at the forefront of our economies. These emerging roles demand knowledge and skills in science, technology, engineering, and mathematics (STEM).**

STEM, an acronym that stands for Science, Technology, Engineering, and Mathematics, a term used to encompass fields of knowledge and careers related to these disciplines. This terminology is frequently employed in the context of educational programmes and initiatives aimed at promoting education and careers in these areas. They are considered fundamental to fostering innovation, progress, and development across various sectors, including the economy, science, technology, health, and many others.

However, it is concerning that millions of children and young people are not acquiring the skills necessary to actively engage in society. Girls often miss out on developing these skills that are crucial for their lifelong effectiveness as citizens and agents of change. High-quality STEM education can nurture these skills, including lateral thinking, proficient use of digital resources, problem-solving, and innovation.

# IMPORTANT DATA:

**MILLIONS of girls**
are deprived of opportunities that could nurture their skills, including in STEM.

In the developing world,
**125 MILLION school-age girls**
are out of primary and secondary school.

Among them,
**FEWER THAN HALF**
make it to the higher secondary level, where STEM skills can be further solidified

* The exclusion of girls from education begins early and escalates over time, as the vast majority of secondary-school-aged girls never even start primary education.

ALAM (2020)

# Women and their representation in STEM

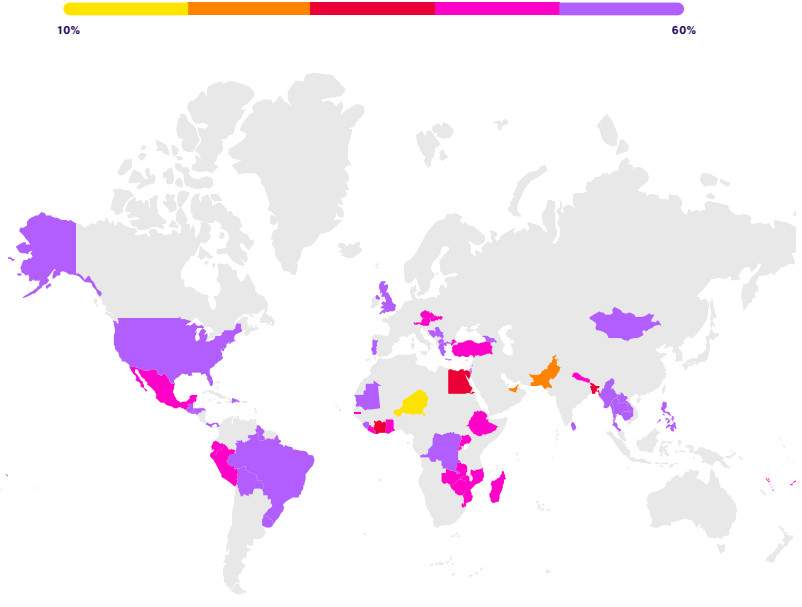
## Women make up about **40% OF THE STEM WORKFORCE.**

They are well-represented in healthcare, however, heavily underrepresented in engineering and technology jobs and the STEM jobs of the future.

In any scenario presented by the following map, prepared by UNICEF in 2020, the women's workforce appears below 50%. According to the map, in Brazil, 47% of workers in STEM areas are women, while in the United Kingdom, this number drops to 40.1%. In the Americas, Brazil is second only to the United States, which has 47.7% of jobs in scientific or technological areas occupied by STEM. In third place, Bolivia appears with 41.9% of female participation. In European territory, with 40.1% of female representation in STEM areas, appears the United Kingdom. In 2020, the first position belonged to North Macedonia with 50.7%, followed by Serbia with 47.48%.

FIG 1

**PARTICIPATION OF FEMALE WORKERS IN STEM AREAS (%)**




_SOURCE
www.unicef.org/globalinsight/stories/mapping-gender-equality-stem-school-work

# The digital skills of boys and girls and their impact on their education

**THE INTERNET IS OFTEN:**
**celebrated for its ability to help students develop.**

**BUT IT IS SIMULTANEOUSLY criticised for reducing children's quality of life and exposing them to unknown and unprecedented dangers.**

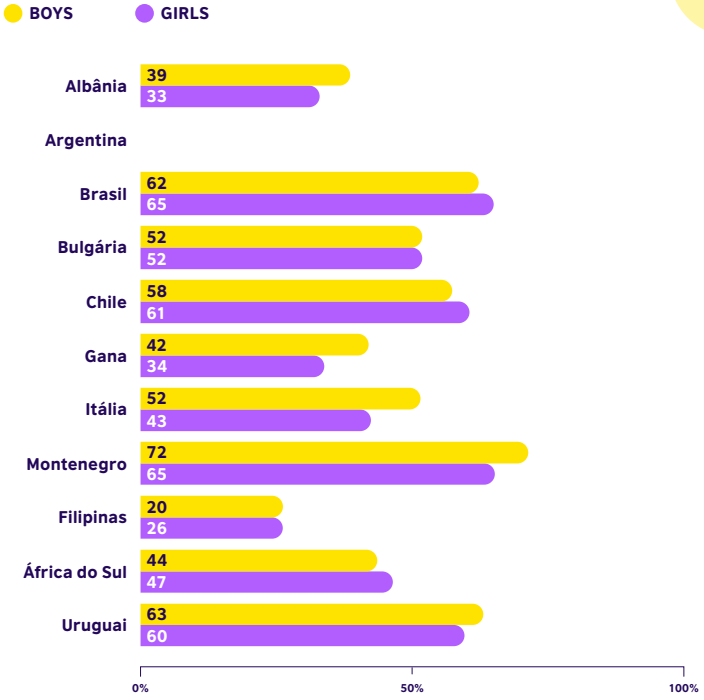
There is considerable debate about when or how children's rights – including the rights to expression, privacy, information, play and protection from harm, as set out in the United Nations Convention on the Rights of the Child – can be realised or violated in the digital age. With more children around the world accessing the Internet every day, it's more important than ever to shed light on how the Internet can improve children's life chances while protecting them from harm or abuse.

Critical thinking has probably never been as important as it is in the digital age, due to the constant flow of information that children and adults alike are exposed to. On the one hand, misinformation and exposure to fake news are growing concerns, along with concerns about the effects of so-called "echo chambers". According to Cherylin and Posetti (2019), these chambers function as "filter bubbles" formed by individuals on social networks, when sharing information based on relationships of trust, but without mediation. This form of information curation challenges traditional forms of content dissemination due to the greater traction gained by inaccurate, false, and even malicious information. As children have little ability to critically assess these data, promoting the development of a more critical attitude at school has become a necessity.

According to the "Global Kids Online" report published by UNICEF in 2019, information seeking skills and assessment skills vary by gender. Also, the direction of the difference varies by country, as we can see in the following image. In 2019, the same report highlighted small differences in Albania, Ghana, Italy, and Montenegro, where boys report higher abilities; and in the Philippines where, again, girls reported superior skills.

FIG 2

## CHILDREN (%) WHO HAVE HIGH CRITICAL EVALUATION SKILLS, BY GENDER




_SOURCE
www.unicef-irc.org/publications/pdf/GKO%20LAYOUT%20MAIN%20REPORT.pdf

**CHILDREN'S ONLINE ACTIVITIES are becoming means through which they communicate, collaborate with others, pursue their interests and hobbies, and broaden their horizons. However, it's important to note that such activities also leave behind a traceable digital footprint.**

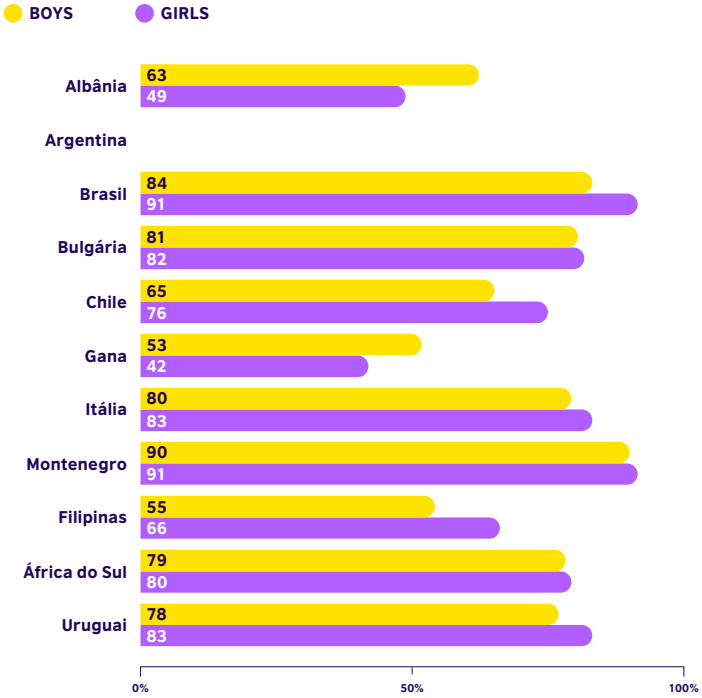
Personal information is increasingly being used by organisations (schools, banks, social networks, companies, and many others) for various commercial purposes.

For individuals, the ability to manage their digital identities and protect their data while engaging in online searches and communication is an increasingly important skill. This skill is essential for maintaining privacy, security, and preventing fraud.

In addition, there are some gender differences between the self-privacy skills reported in the report. As an example, in Albania and Ghana, boys report higher privacy skills than girls, while the opposite is true in Brazil, Chile, the Philippines and Uruguay. In Bulgaria, Italy, Montenegro and South Africa, gender differences are insignificant.

FIG 3

## PERCENTAGE OF CHILDREN BETTER ABLE TO ENSURE THEIR OWN PRIVACY, BY GENDER

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www.unicef-irc.org/publications/pdf/GKO%20LAYOUT%20MAIN%20REPORT.pdf

**How can we identify ways to discover gender balance in learning contexts in Brazil?**

**What data is available at national level?**

**What data is collected in your school with reference to gender?**

**Is there a key moment (age) when girls drop out of STEM? When would interventions/ support be most effective?**

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# Other Publications

BRITISH COUNCIL

KING'S College LONDON

STEM EDUCATION HUB

Fundação Carlos Chagas

Museu do Amanhã

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