

EXPANDING HORIZONS

Women in Science
programme strengthens
networks in Latin
America



magazine Women in Science

TOWARDS RECOGNITION

More balance of
publications and citations
between men and women

ANTI-RACIST TECHNOLOGIES

For the end of implicit
discrimination in
algorithms

WOMEN IN SCIENCE

Editorial

The challenges of promoting diversity in science are cyclical and seasonal. They come with more force at sometimes and, at others, seem to simmer down, but they are not necessarily resolved. The last two years, in particular, have raised concerns and views about society's relationship with science, and therefore warranted a call to the **British Council's** mission, through the **Women in Science** programme, to influence behaviour in the agendas of gender, participation and women leadership in STEM - English acronym for Science, Technology, Engineering and Mathematics.

The third issue of the **Women in Science** magazine is based on activities carried out throughout 2020 and the first half of 2021 in the United Kingdom, Brazil, Peru and Mexico, and highlights the importance of the dialogues promoted by the programme with transnational and regional impact. The stories point to scenarios that show inequality, while on the other hand, describe initiatives to promote the presence of women in science, reaffirming the qualitative gains of diversity.

These debates compel us to create historic opportunities based on joint contribution, so that we can achieve transforming and inclusive science, which represents the model of society that we want to build and share with future generations. We therefore hope that the magazine's content will, once again, serve as an instrument to amplify actions in favour of gender equality in the scientific ecosystem.

The life cycle of the **Women in Science** programme unfolds beyond this publication. Since the last issue, we've taken content to the **British Council's** social media and launched the **Women in Science** podcast, now in its second season. In doing so, we have expanded our narratives, in line with the idea of digital competence that the programme focuses on. Occupying online spaces is also enabling more connections for women and girls to build journeys in scientific-technological careers.

*Andrew Newton – **Director British Council Brazil***

Staff

British Council Team

Andrew Newton

Director British Council Brazil

Diana Daste

Director Education

Vera Regina Oliveira

Senior Manager Higher
Education and Science

Raíssa Daher

Project Manager Higher
Education and Science

Heloísa Fimiani

Project Officer Higher
Education and Science

Marcela Gobo

Project Officer

Education Services

Fernanda Medeiros

Senior Manager, Marketing

Juliana Ferreira

Digital Marketing Manager

Amanda Ariela

Marketing Officer

Reporting

Luana Cruz

Luiza Lages

Mariana Alencar

Verônica Soares

Editorial Coordination

Vera Regina Oliveira, Raíssa
Daher, Heloísa Fimiani

Editorial Production & Editing

Luana Cruz | Matildas
Comunicação

Graphic Design & Layout

Camila Aringhieri

Illustration

Andressa Meissner

Revision

Heloísa Fimiani

Translation

Morné Greyling

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The British Council is the UK's international organisation for cultural relations and educational opportunities. It is present in more than 100 countries and their main partners include governments, non-government organisations and private institutions. They promote cooperation between the United Kingdom and Brazil in the areas of the English language, arts, sports, society and education.

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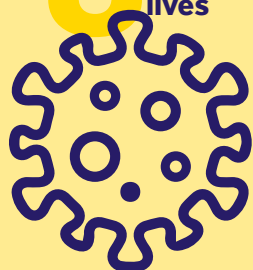
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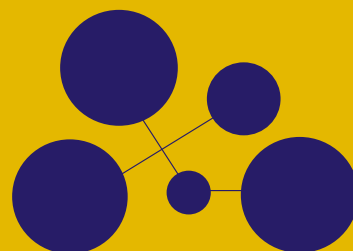
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Wealth of diversity in the Americas

Diana Daste



Following up with the transforming work of women scientists leading research on COVID-19 over the last year has been very relevant for those whose mission is to communicate the richness of diversity in the sciences and train people willing to generate social impact more equitably. The **British Council's Women in Science** programme highlights, replicates and amplifies the visibility of researchers involved in discovering and publicising the facets of the new Coronavirus and the impacts of the pandemic that have changed the course of history. Some of the scien-

tists mentioned in this magazine's articles, including Jaqueline Goes de Jesus, Natalia Pasternak, Rafaela Ribeiro, Anna Blakney and Samantha Vanderslott, are portraits of an assertive strategy of prioritising gender issues to make the achievements and results of women in science visible.

More than ever, the programme has grown in terms of territory and influence to strengthen these networks of researchers and elevate discussions that involve the gender dimension. The United Kingdom, Brazil, Mexico and Peru will walk this timeline of inspiration, interest, recognition, performance and leadership. Integrated by the programme's actions, these countries will continue in the search of a comprehensive proposal that can have impacts from the different interventions to promote women's participation in STEM.

In its third edition, the **Women in Science** magazine team gathered testimonies, cases and events that reinforce the need for *Long live women in science*, as highlighted in the cover story. You will see that challenges remain in articulating the opening of spaces for scientists through institutional and public policies that recognise the particularities of different identities, such as the presence of transsexual women in technology, portrayed in an article in this issue, and which raises debates about discrimination. The magazine also brings content about the historical imbalance between publications and citations by men and women, a mark of the under-representation of researchers in scientific production and dissemination. Another milestone in this edition is the dialogue with the present, bringing a special look at *the lives of women in the pandemic* and at women's leading roles in debates on climate change and *Climate interventions*.

The **Women in Science** programme is reaping many benefits, especially by linking up with partners such as universities, museums, ministries, commissions, and organised groups of scientists in the Americas. Many of these actors appear in this edition, as in previous ones, showing the important role of capturing interest, taking it a step further, and generating engagement in the debate on women's presence. By supporting local and regional agendas, the programme highlights inequalities and promotes diversity within the multiplicity of factors and conditions that it represents.

The countries of the Americas - all the same, highly unequal - have already witnessed that equity between men and women has been achieved in admission to higher education, but that there is still an unequal distribution by areas of knowledge. They also realised that the highest levels of the scientific system are occupied by men and that the participation of researchers occurs simultaneously with different forms of exclusion.

We will change these scenarios, plant seeds and build legacies for women in science in the medium- and long-term futures. Soon, we will be holding the twentieth edition of the Gender Summit, seeking to value scientific excellence, equity and social relevance of research results. Furthermore, we are committed to encouraging different projects that promote the participation of girls in science and celebrate the diversity of cultures because we believe this: *the future is for everyone!*

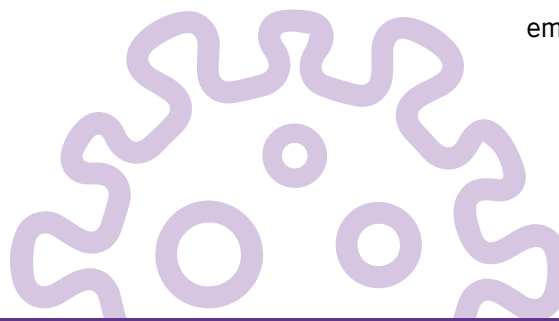
In a year of profound changes in women's lives, scientists and entrepreneurs debate changes brought about by the new Coronavirus

The pandemic and women's lives

Verônica Soares da Costa

Illustration: Andressa Meissner

The world continues being challenged to react to the problems and transformations brought about by the new Coronavirus. Since 2020, a focus on science and social debates that feed into the **Women in Science** programme has been established. Faced with the impossibility of holding in-person events due to the pandemic, the **British Council** promoted a series of webinars to debate, together with women scientists and entrepreneurs, the scenario that was already announced in the first months of the Covid-19 crisis: the impacts of the disease on women's lives. It was not, then, about reflecting on the picture of women affected by the virus, but rather to shed light on the scenario of gender inequality that was intensified with prevention measures, such as quarantine and social distancing that emerged as ways of epidemiological control.



The conversations promoted on that occasion anticipated what research later published by scientists and developed by consultants would confirm: in addition to all the damage to health and the economy, the pandemic brought incalculable damage to the careers of women, especially mothers. Data published by the McKinsey Global Institute indicate that women's jobs were 1.8 times more vulnerable to the pandemic crisis than those of men. The report titled ***"Covid-19 and Gender Equality: Counteracting the Regressive Effects"*** pointed out that women account for 39% of global employment but also for 54% of overall job losses during the pandemic. Among the reasons that explain the situation is the significant increase in unpaid workload related to care, which is disproportionately performed by women.

For Rossana Soletti, PhD in Morphological Sciences, professor at Brazil's Federal University of Rio Grande do Sul (UFRGS) and member of the Parent in Science project, the context of the pandemic was challenging. As mother of two girls, Lara (5) and Marina (7), she found herself having to split the time allocated to her own academic production and classes with that of her daughters, who started studying remotely. "In the beginning, it was a matter of having to adapt to working from home and understanding the city's lockdown. Then I had to organise myself to accompany my daughters in three or four video lessons, make and record activities, and then send them to teachers. But I can't complain, because I still consider myself privileged given the many realities that we face in Brazil", she comments.

Persistent inequalities

Rossana Soletti was one of the participants in the first webinar held in 2020 by the **Women in Science** programme, themed "Women debate: Why does Covid-19 affect women's

// in addition to all the damage to health and the economy, the pandemic brought incalculable damage to the careers of women, especially mothers

scientific productivity?". Joining her was Márcia Barbosa, also a professor at UFRGS, who argues that the pandemic has only intensified an already existing scenario of inequality. She presented data from the United Nations Educational, Scientific and Cultural Organisation (Unesco) that demonstrate that women have already reached levels of equality in undergraduate and masters courses around the world, however, throughout their academic career, there is the so-called "leaky pipeline", or the "punctured pipe" metaphor, which describes how women become underrepresented minorities in STEM fields.

Available at:
bit.ly/Covid19gênero



“It is very difficult to know where these women have gone, because they disappear and leak from the system”, comments Márcia Barbosa. She advocates that educational and research institutions develop compensatory measures, based on this evidence, to reduce inequalities. “After the pandemic, women will suffer even more from this scenario”, she regrets.

Available at:
bit.ly/Economiadocuidado



// When the pandemic hit, scientists found themselves at home, with children dependent for 24 hours a day, making it even more difficult to keep up with their work.

The Economy of Care

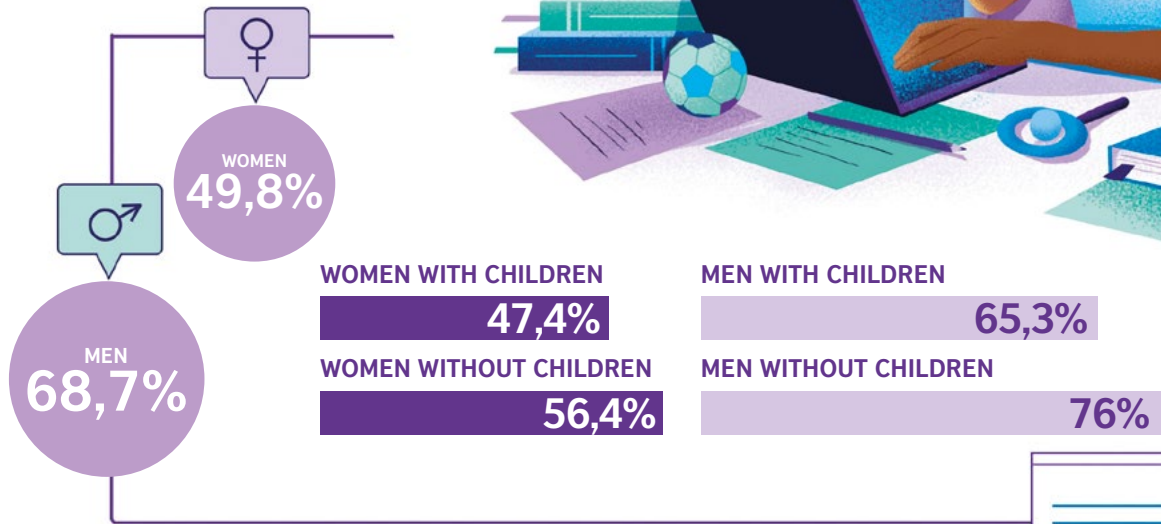
In May 2020, **issue 581 of the scientific journal, Nature** announced, from preliminary analyses of article submission data, that women scientists were submitting fewer preprints and starting fewer research projects than their male counterparts. There are different explanations for this scenario, but almost all fall into the inequalities of the economy of care. Also in the journal, Molly King, a sociologist at Santa Clara University in California, explains that evidence suggests that male academics are more likely to have a partner who does not work outside of the home. Their female peers, on the other hand, especially those in the natural sciences, are more likely to have a partner who is also from the academic field. Even in families where both are researchers, evidence shows that women do more housework than men.

At Parent in Science, a group of researchers was already engaged in studies that sought to understand the impact that the arrival of sons and daughters has on the career of scientists in Brazil. The group published a **letter in Science magazine** that warned of the effects of the pandemic. “One of the most used metrics to assess a scientist’s productivity is the publication of articles, and we have already seen that, in general, the number of annual publications by women scientists drops after the birth of a child and can take up to about four years to be recovered”, points out Rossana. When the pandemic hit, scientists found themselves at home, with children dependent for 24 hours a day, making it even more difficult to keep up with their work. “If we compare men to women, about 50% of women managed to publish, as well as about 70% of men. But if we break it down further to race and parenting, we see extremes. If we compare women with small children and men without children, there’s a much bigger difference, in the same way, if we compare black women and white men”, she comments.

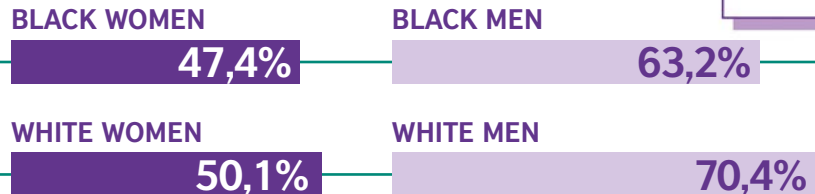
The group published the letter “Impact of Covid-19 in academic mothers” in the journal Science

Academic production during the pandemic

Researchers who submitted scientific articles as planned



The race effect



Race and parenting effect on men



Race and parenting effect on women



Live broadcasts, Connections and Hope

Sonia Guimarães, professor at the Technological Institute of Aeronautics (ITA), highlights some advantages of intensifying connections in webinars and online seminars driven by the need for social distancing: “I travel a lot to give lectures, but most people who would like to see and listen to me do not always have the resources for me to go to their states. With the pandemic, I’m reaching universities I didn’t know, and I can lecture from home. These connections are increasing.” In the webinar sponsored by the **British Council**, she highlighted live events held throughout Brazil, and encouraged people from minority groups and with less resources to join the scientific business. “There are very intelligent boys and girls who are not even aware of the possibilities they have to study. I work to encourage girls to come to science, and with online events I can talk to the whole of Brazil”.

On the other hand, in the webinar “Women Debate: Covid-19 Challenges on Black Women Entrepreneurs”, held in partnership with the DICE (Developing Inclusive and Creative Economies) programme, women who study and accelerate Brazilian female entrepreneurship discussed how the pandemic has affected the daily lives of black women entrepreneurs in their different areas. Income, access to resources and ethnicity are part of the challenges in the lines of work of organisations that want to go into business, but face uncertainties.

Silvana Bahia, Head of Olabi, recalls that black women are the ones who have the least investments available for their businesses and, at a time of health and humanitarian crisis, these resources become scarcer. According to her, much is said about digitisation and digital transformation, but taking the business and putting it on online is still a challenge for part of the population that does not have access to internet, cell phones or computers at home. Ítala Herta, from the Vale do Dendê and Diver.SSA projects, highlighted that the pandemic has accentuated problems of income, access and distribution of resources that already existed, in a country where structural violence is part of the everyday life. “When we talk about women in Brazil, we refer to women who live below the poverty line, are subject to domestic violence and count for increasingly significant numbers in the pandemic”, she points out.

More scientists at:
bit.ly/teamhaloscience



Women on the front lines

The Halo Team is an initiative to support collaboration between scientists around the world and help end the pandemic. It was created in partnership with The Vaccine Confidence Project, at the School of Hygiene and Tropical Medicine at the University of London. Meet four **frontline researchers in the fight against Covid-19**:

Photograph: Reproduction
Lattes Curriculum



Jaqueline Goes de Jesus (Brazil)

Biomedical scientist responsible for the genetic sequencing of the new Coronavirus in the first cases of Covid-19 in Latin America. Jaqueline disseminates science on Twitter @drajaquegoes and TikTok.

Photograph: Reproduction project website
(teamhalo.org/?guide=dr-anna-blakney)



Anna Blakney (United Kingdom)

Anna develops research on self-amplifying RNA as a vaccine platform, a new type of RNA capable of making copies of itself as soon as it enters a cell. During the pandemic, she focused on vaccine formulation. Anna disseminates science on Twitter @AnnaBlakney and TikTok.

Photograph: Reproduction website
samanthavanderslott.com/



Samantha Vanderslott (United Kingdom)

Health sociologist at the Oxford Vaccine Group at Oxford University, she primarily uses qualitative methods to research health, society and politics. During the pandemic, Samantha researched opinions about vaccines and increasing misinformation. She shares disseminates on Twitter @SJVanders and Tik Tok.



Natalia Pasternak (Brasil)

Director-President of the *Instituto Questão de Ciência*, the first Brazilian institution to promote critical thinking and public policies based on scientific evidence. Natalia disseminates science on Twitter @TaschnerNatalia and TikTok.

Photograph: Disclosure/Science Question Institute (IOC)

Read more The challenges of being a mother and researcher during the Covid-19 pandemic in Brazil bit.ly/maternidadenapandemia

Despite the differences between countries in the Americas, there are similar and unfavourable scenarios for participation of women in science

All the same, yet so unequal

Luana Cruz

Illustration: Andressa Meissner

A Brazilian agronomist, graduated in the 1970s, a time when merely four out of 50 students in a classroom were women. A Mexican psychologist, the third oldest daughter of six in a family in which studying for a university degree was a priority. A Peruvian administrator, whose journey was made in a corporate world characterised by the underrepresentation of women. Apart from their international academic careers dedicated to the studies of their scientific areas, what Lea Velho, Norma Blazquez and Beatrice Avolio have in common is their involvement in research and deep discussions, from a gender perspective, about the presence of women in science.

While acknowledging the **differences between their countries of origin**, they all point to similar scenarios within the debates on diversity in science for the Americas. While equity between men and women has been achieved in admission to higher education and there has been an increase in the presence of women in post-graduate studies, there is still an uneven distribution in areas of knowledge. As scientific careers progress, so the proportion of women decreases, ending up with the highest levels within the scientific system being occupied by men, both in positions of research as well as management. Women's participation occurs si-

multaneously in different forms of exclusion and is still present in spaces and levels of different academic circles.

Lea points out that Brazil's particular challenge is to look at the issue of intersectionality between gender and race, referring to the unfavourable situation of black women in Academia. For Norma, the territorial specificity of Mexico, a very large country with a concentration of scientific production in central regions, is a diversion point. Peru, according to Beatrice, produces little research, and does not have scientific tradition.

// “Some areas are very reluctant. Is it a matter of discrimination within the university or a question of girls not being encouraged at school and by their families to follow a profession such as Physics?”

When asked about the Brazilian scenario, Lea Velho says “a slow but consistent change in the participation of women has been perceived. Due to activism and awareness raising, the repertoires of the research group of the National Council for Scientific and Technological Development (CNPq), for example, already collect data on men and women who are participants and leaders of research groups. Recently, women have appeared in university management positions. Today, the Federal University of Rio de Janeiro (UFRJ) has a woman as chancellor as well as Fiocruz, who also have a woman in charge”

There still are areas of knowledge that are male strongholds. Lea recalls a doctoral thesis that she supervised in the 1990s, where the researcher collected data on the participation of women in the Institute of Physics at the State University of Campinas (Unicamp). The numbers remain unchanged to date. “Some areas are very reluctant. Is it a matter of discrimination within the university or a question of girls not being encouraged at school and by their families to follow a profession such as Physics?”, she wonders. In another doctoral research supervised by Lea, undergraduate students in STEM areas were interviewed about their trajectories and reported the low encouragement of families to pursue an academic career. When they decided to study Physics, the family thought they would not be able to make a career out of it. And when they were inside the

university classroom, they experienced discrimination. “According to the students, there was a teacher who at the end of every class would say: the girls who didn’t understand, ask the boys,” says Lea.

In Mexico, the scientific community is mostly made up of men who define the research, evaluate and recognise those who carry it out. When analysing the survey of the National System of Researchers (SNI) by gender, it is possible to see the slow and gradual growth in the participation of women in the scientific community. In 1984, the year the SNI started, the percentage of women was 19% and, 40 years later, in 2020, they reached 39%. Only 20% reach level III, the

highest. When comparing men and women with the same academic merit, corresponding accreditation and who meet identical productivity demands, it is clear that **horizontal and vertical segregation** continues to occur because there is no homogeneous distribution by areas of knowledge, which manifests itself in the rarity of female presence in some fields and disciplines, and in the difficulties that women continue to face in accessing places of greater recognition.

In Engineering, Physical-Mathematical and Earth Sciences, Mexican women represent

20%, reinforcing the need to analyse the inequalities in the evaluation mechanisms and composition of the evaluation committees that regulate admission to each scientific area and subsequent promotions, which do not yet contemplate gender inclusion strategies. “We can talk about an evolution in the participation of women in science and this constitutes a new element that is producing changes in educational and scientific institutions and in the structure of scientific knowledge. However, even when these advances are undeniable, it is far from being equitable”, says Norma Blazquez.

In Peru, 50.4% of all university students are women. Of all students, 33% are in STEM careers, but of these, only 29% are women. Among higher education professors, women account for 30% of those in private institutions and 25% in public institutions. Among scientists with exclusive dedication to research, women amount to 1,392 out of 4,500. “There are interesting examples of women who have had great experiences in science, but cases like that are not massive. I do wish they were, though”, analyses Beatrice Avolio about the Peruvian context, based on data from the National Council of Science, Technology and Technological Innovation (Concytec).

The representation of women decreases as they advance in their academic career, resulting in the low presence of researchers in senior positions. This vertical segregation occurs in every country in the Americas and around the world. In addition to underrepresentation at higher levels, women are also underrepresented in STEM areas and highly under-represented in some specific fields, such as engineering. Horizontal segregation is evident not only in research environments but also in higher education.



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Regional challenges

Full schooling for men and women remains a challenge for nations in the Americas. One of the factors that most influence access to education and science is the socioeconomic. People with fewer resources face low quality education systems and the possibilities of reaching higher education depend on the economic resources available in their families, thereby pulling them further away from graduation. In several countries, however, public universities are free.

According to Norma, collaborative studies carried out in research networks in Latin America show that women's training time is slower as schooling contrasts with traditional gender roles and stereotypes. One factor influencing qualification is the schedule of courses at universities, as many women carry out other care activities derived from motherhood or traditional family and social roles.

"The type of education - day, evening, in person or remote - is fundamental for getting to know about the inclusion of women and men in these activities in more detail. For over a decade, Cuba has stood out for having a greater number of women in STEM areas, unlike what happens in other countries. This is explained by the type of government regime, in which public and compulsory education is offered equally to men and women", says the Mexican researcher.

In Peru, in order to minimise these training issues, educational programmes began to be designed with a focus on three populations: school-aged women, teachers and professionals working in the labour market. According to Beatrice, this division facilitates "macro, meso and micro institutional strategies on the situation of women".

Another regional challenge is that the organisation of S&T systems is different in the Americas, especially because some countries have a stronger tradition of scientific production, and the training time required for higher education and postgraduate education is different. Brazil, in particular, is much sought after by students from other Latin American countries as it has a large and structured system with 4,638 postgraduate programmes, under the umbrella of the Co-ordination for the Improvement of Higher Education Staff (Capes). For Lea, from this perspective, Brazil has the potential to influence the various Latin American students to discuss the participation of women in science.

The Brazilian researcher cites other examples to demonstrate the differences between nations. Uruguay has only one public university where the commission which distributes resources and scholarships for scientific production is allocated. "Argentina has an important system for providing scholarships, but scientific employment is much more precarious. There are researchers who, in order to work full-time, need to be linked to two different universities. And others who, to be fully dedicated to research, need salary supplementation grants based on productivity", explains Lea. She also highlights the fact that Argentina has three Nobel Prizes, a recognised scientific tradition, and even so, a poorly organised career structure.

**Listen to the Women
in Science podcast
featuring the
interviewees in this story**



Gender and Science in the Americas: Holistic view

The three researchers in Brazil, Mexico and Peru highlight that there is a lack of information necessary to allow comparative studies between countries and diagnoses to enable improved public policies on gender and science in Latin America. “The information is outdated, not always public, and there is no gender classification data. There are different sources causing data variation between institutions and sometimes within the same institution. New indicators and data sources are needed to allow for better policy development, as in the coming years our countries’ statistical, political and scientific efforts will have to focus on improving data collection systems, where gender indicators must be of more importance”, explains Norma.

In 2021, the **British Council** published the ‘Comparative Research for Women and Girls in STEM in Latin America’ report, carried out by a consortium formed by *Grupo Technopolis* and Unesco, which points out why it is essential to have more women in science, especially in the STEM areas. It is a matter of social justice, as gender equality and access to science are recognised as human rights, and that women contribute with their perspectives and approaches, building a science of excellence. Furthermore, women are essential in helping to fill the gap in STEM labour shortages, and gender equality in these areas benefits scientific productivity and quality. Below are points from the report that shed light on continental scenarios of women’s participation in science:

Gender prejudice and institutional barriers affect the integration of women and girls into STEM areas:

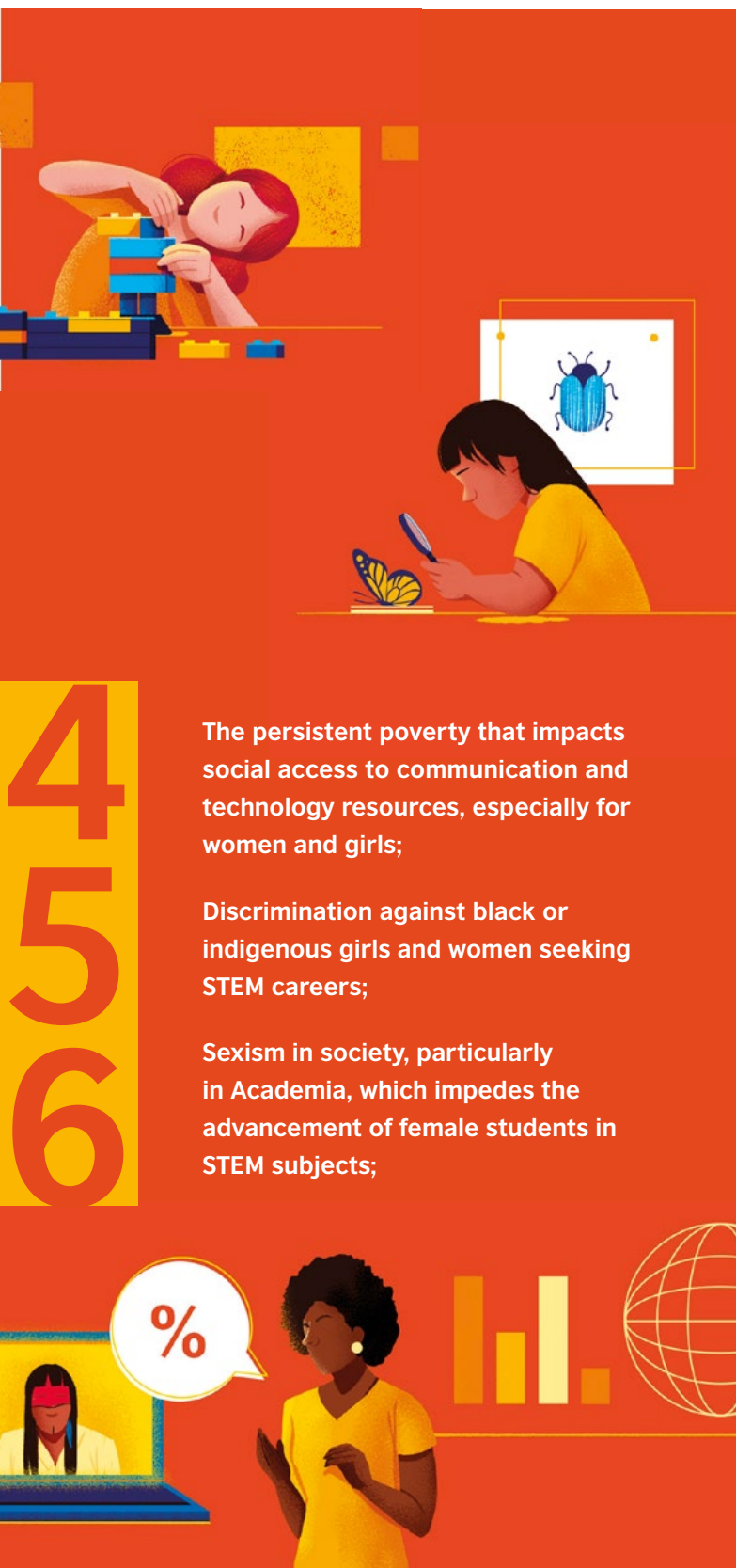


Society’s general misunderstanding of STEM careers, which tend to be considered more difficult than other professions;

Gender-stereotyped social representation of educational performance: STEM careers are perceived as male domains;

Lack of gender-sensitive STEM pedagogy and tools, as well as lack of infrastructure, which affects most public and private schools;

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2
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Challenges that impact the progression of women and girls in STEM careers:


1. Cultural stereotypes and attitudes towards women;
2. Low level of digital inclusion;
3. Little awareness of the gender dimension in the teaching community;
4. Lack of recognition and promotion of female role models in science;
5. Low culture of inclusion, affecting mainly indigenous and black women;
6. Scarcity of financial and political resources;
7. Institutions do not support women in STEM areas in balancing work and personal life so that they can handle careers;
8. Absence of the gender dimension in research content, practices and agendas;
9. Lack of representation of women in the private sector.

4
5
6

The persistent poverty that impacts social access to communication and technology resources, especially for women and girls;

Discrimination against black or indigenous girls and women seeking STEM careers;

Sexism in society, particularly in Academia, which impedes the advancement of female students in STEM subjects;

A woman with dark hair, wearing black-rimmed glasses and large pink headphones, is shown from the chest up. She has a wide, enthusiastic smile with her mouth open, showing her teeth. She is holding a pink, cylindrical microphone in front of her. The background is a stylized illustration of bookshelves filled with books. The overall color palette is dominated by pink and blue.

The presence of transsexual women in technology raises debate about discrimination and highlights the importance of diversity in companies

Mariana Alencar

Illustration: Andressa Meissner

TRANSformation in technology

In a room decorated with pink objects and artifacts reminiscent of geek culture, Evelyn Mendes spends at least eight hours of her day working at her computer. She lives in Porto Alegre (Rio Grande do Sul state) while the company she provides services to is a 6 hours' flight away, in Manaus (Amazonas State), and has to allow for a one-hour difference in time zone in her work routine. But this is of little concern, cheerfully stating that she wouldn't have any other profession than that of analyst and system developer. Since a child, her fascination with the universe of technology has had a direct impact on her professional choices.

At around the age of eight, bedridden with a virus, a neighbour introduced her to author **Isaac Azimov**. It was then that she discovered science fiction, and her curiosity and fascination for the transformative power of technology began and would accompany her for many years to come. As an adult, Evelyn went to work at a radio station where she learned programming. She was constantly called on by friends who needed to create websites or weren't good with computers. "It was a time when technology was synonymous with radio and TV. I didn't have a computer at home, so I used my work computer to research programming language, printed it out and studied at home. The following day, I would try to apply everything I had learned on the radio station's computers", she recalls.

Russian writer and biochemist who has lived in the United States for most of his life. He is the author of science fiction and science dissemination works. Among the most famous of his books is 'I, Robot' (1950).

The *gaucha*'s dedication and passion turned her into the laughingstock among her friends. She remembers that throughout her childhood and adolescence she was known as "the nerd who liked weird things" but she overcame this prejudice and became psychologically strong. At that time, however, Evelyn did not know that she would be the first transsexual woman to change her name at the Rio Grande do Sul registry office without the need for a court case.

Today, at 45, Evelyn Mendes is an exception in a country with cruel statistics regarding the transgender population. This is because, in Brazil, life expectancy for a transvestite and a transsexual woman is a mere 35 years, due to murders or suicides, according to data from the Brazilian Institute of Geography and Statistics (IBGE).

Shared problems

Between January and October 2020, 151 trans people were murdered in Brazil, an increase of 22% compared to all the deaths in 2019. This data is based on research carried out by the National Association of Transvestites and Transsexuals (ANTRA), a national network that mobilises 127 Brazilian institutions that develop actions to promote citizenship among the population of transvestites and trans people.

ANTRA's dossier on murders and violence against transsexuals also shows that all victims in 2020 expressed themselves in the female gender, whether transvestites or trans women. Information like this reveals the need for reflection on gender violence associated with violence against LGBT+. In other words, trans people and transvestite women, such as Evelyn Mendes, in addition to suffering oppression due to sexuality, face problems related to gender.

There are other stories similar to Evelyn's. Daniela Andrade, a specialist in Information Technology for over 20 years, gathers stories of discrimination in a market predominantly made up of men and cisgender people. Native to São Paulo and currently working for a technology company based in Canada, she has already been fired for being a trans woman, had to stand abuse and bad jokes, and proved extraordinary competence, unlike her male colleagues.

//“Dealing with discrimination in the technology area is difficult. It’s very bad to look around and not see anyone else like you.”



“Dealing with discrimination in the technology area is difficult. It’s very bad to look around and not see anyone else like you. I’ve worked in places where I didn’t see other women, trans people, or black people, so I wasn’t able to share experiences. The market seems to be constantly reminding you that the area is not for you, that it is not your environment and that you best give up. As a result, you need to prove that you are 10 times more capable, as your mistakes are placed under a magnifying glass”, reports the specialist.

Seeking to change this scenario, Daniela uses social network to share experiences and invite people to reflect. “Solutions will always overlook education. I see that there are very few women in the technology area because there is still a very big stereotype that the hard sciences are for men. If you study the history of information technology, you will notice that in the beginning we had big names for women. This proves that competence is not linked to sex or gender”.

Another action developed by Daniela Andrade was the creation of an employment platform for transvestites and transsexuals. She realised that, despite meeting all the requirements of a company, trans people are not hired when they reveal their gender identity. Faced with this reality, Daniela teamed up with her friend Paulo Bevilacqua and created [TransEmpregos](http://www.transempregos.org/), a website that seeks to bring the transsexual public closer to companies that intend to increase diversity in the workforce. “We work towards destroying the world we live in today and building a new one with less prejudice. All of this while having to deal with this prejudiced world. It’s like fixing an airplane in mid-flight”, says Daniela.

//In the Brazilian technology labour market, the number of men (68.3%) more than doubles the number of women (31.5%).

Diversity generates solutions

In the areas of technology and innovation, women are the minority. This was proven by the study #QuemCodaBR, carried out between 2018 and 2019, by PretaLab in partnership with Thoughtworks. The survey showed that, in the Brazilian technology labour market, the number of men (68.3%) more than doubles the number of women (31.5%).

The lack of diversity in this area results in companies not being able to obtain different solutions to old problems. “I’ve attended meetings where there were no women, black people nor trans people, except for myself. Those people needed to identify a problem, but they were only able to see one solution. As there was only one way of thinking, the company was losing money. People with different backgrounds think differently and are consequently able to think of innovative solutions”, Evelyn Mendes comments.

A very common problem faced by transgender people is even associated with the homogeneity of professionals in the field of technology. Evelyn points out that, currently, institutions such as banks ask users to photograph themselves holding their IDs. Through facial recognition technology, companies are able to identify possible

Understand the initiative at:
www.transempregos.org/



fraud. However, this practice excludes the bodily changes that trans people undergo during transition. “Our faces change a lot during the process. So what do we do in these cases? We cannot change our ID every time there is a change to our face. Things like this need to be revised”, the analyst comments.

Companies’ databases and services also ignore the experience of transgender people when they use models that link their tax numbers to their birth names. “At some point, some developer thought this would be a good idea, but didn’t consider that we could possibly change our names. I’ve had to deal with this many times as I try to log into systems and I can’t because my social name and social security number don’t match on that database. The trend is that these models are becoming less and less functional, but in order to change, companies need diversity”, comments Evelyn Mendes.

Diversity must therefore be addressed by both people as well as companies in a way that takes the potential vulnerabilities that exist in different identities into account. According to Diana Daste, Acting Regional Lead Higher Education & Science / AMERICAS at the **British Council**, we need to talk about women in science, but we cannot ignore the diversity that exists within the female universe itself.

“We are not necessarily talking about binary identities, but we bring other voices to be part of the debate, presenting the ethnic-racial issue, the issue of class and how all these conditions imply an identity that should not be understood as absolute either. When debating diversity, intersectionality and richness of these multiple identities, we add the concern and care for potential vulnerabilities within this large body that we call ‘women in science’. One has to be careful to reach diversity within the multiplicity of factors and conditions that it represents”, she reflects.

Listen to the Women
in Science podcast
featuring the
interviewees in this story



She, bibliographical reference

Luiza Lages

Illustration: Andressa Meissner



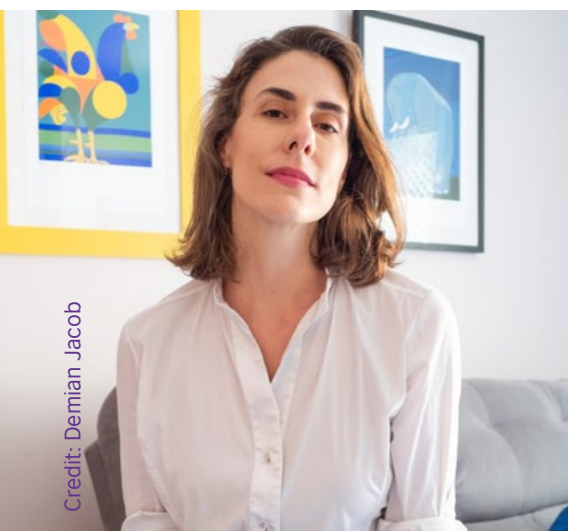
A historical imbalance between publications and citations by men and women highlights the under-representation of researchers in scientific production and dissemination; and they call for structural changes in science

At the end of the 19th century, Marie and Pierre Curie began working together in the laboratory. From the beginning, the couple negotiated credits in their joint publications: they used self-citation and footnotes that described who was responsible for different aspects of each study. The two also rigorously cited their own previous work, creating a paper trail that allowed each of them to shine through. Along with her husband and Henri Becquerel, Marie Curie was the first woman to receive a Nobel prize, in 1903. In 1911, she was once again awarded the Nobel Prize in Chemistry. Until today, she is the only woman to win the award twice.

Marie Curie was the first great scientist to receive full credit for her scientific contributions. In addition to the arduous hours spent in the laboratory, the recognition is mainly a reflection of her insistence on collaboration and self-citation, the basis for metrics that still function today as a ruler of scientific productivity. Currently, the number of articles published by a researcher is essential for approval in public calls for research projects, public examinations and career advancement.

“We’ve come a long way since Marie Curie, but we know how much attention and greater visibility of men in science still exists. Bibliographic production is still very masculinised: we have literary canons that are essentially based on the productions of white men”, says Érica Souza, professor at the Department of Anthropology and Archaeology at the Federal University of Minas Gerais (UFMG) and coordinator of the Gender and Sexualities Research Group. The under-representation of scientists can be associated with the historical numerical imbalance of productivity, socio-psychological aspects and cultural factors related to gender bias.

Article “Unravelling the gender productivity gap in science: a meta-analytical review”, published on 12 June 2019: bit.ly/gapnaciência



Credit: Demian Jacob

//“The greater the position in science, the greater the presence of men.”

Press support platform, which connects scientists and journalists
bit.ly/agenciabori



In an article published in 2019 in the **Royal Society Open Science** magazine, Julia Astegiano, Esther Sebastián-González and Camila de Toledo Castanho show that there is a gender productivity gap, largely related to greater scientific production attributed to men. They, in turn, published more articles per capita and had more scientific production (articles, grants, research positions) as a group. However, women and men have similar success rates when the work of researchers is directly evaluated – i.e., at the stage of submission of articles to scientific journals, there is an equivalent rate of acceptance for work by men and women.

In Brazil, women account for half of the national scientific production. It is an important proportion, but most of this production is from graduate students, not professors. Today, more than half of those enrolled in master's and doctoral programmes in the country are women. However, they occupy only four out of ten faculty positions in Brazil. “Furthermore, most of the leaders of academic papers, department heads, research groups and graduate programmes are men. The greater the position in science, the greater the presence of men. Even today, and even with half of scientific production being female, men are always more cited and referenced”, says Sabine Righetti, science journalist, researcher at Unicamp and co-founder of **Agência Bori**.

This imbalance is even greater in the STEM field. “These are areas where women have always struggled to get some kind of recognition and continue to do so. It is visible that male production is even more mentioned, that men are more invited to speak in the media. Especially in these tougher areas of knowledge, there is a much greater projection of the masculine”, says Érica.

The development of scientific careers in male-dominated settings, particularly at higher levels of the scientific power structure, can benefit their careers, mainly by increasing visibility. At the same time, it tends to cause a cumulative disadvantage for women's scientific careers, and their consequent invisibil-

ity, which has been referred to as the **“Matilda Effect”**. “For a long time, people only read productions by white men. What is the message that was given? That only white men produce. But actually, you have a whole power struggle, a process of historical exclusion of the production of women, of the production of non-white people. The woman disappears in this production”, explains Érica.

Expression coined by Margaret W. Rossiter, in 1993, to deal with women who were excluded and made invisible in the history of science, generally due to the favouring of well-known male figures in the academic world. It is a reference to Matilda Gage (1826-1898), author of the essay *Woman as an Inventor* (1883), which lists the works of women scientists and shows how, throughout history, many of their achievements have been attributed to men.

// “For a long time, people only read productions by white men. What is the message that was given?”

Maternity and leave

For Érica, socially rooted power dynamics do not favour the place of women in academic production: “we have well-known social factors that also contribute to this situation, such as the burden on women and motherhood”. Worldwide, on average, 15% to 45% of publications by researchers are affected by their children’s first years of life. “Women can reach the top of their scientific careers at around 50 to 55 years old, and men from 45 to 50 years old. We therefore have this five-year gap, which happens precisely because the scientist takes maternity leave. It is a period in which they give up production and research”, explains Adriana Tonini, director of Engineering, Exact, Human and Social Sciences at the National Council for Scientific and Technological Development (CNPq).

Adriana was involved in an important achievement for Brazilian researchers: the *Lattes* Platform, which holds the CVs of researchers nationwide, now has a section in which women can indicate their periods of maternity leave. The change in the platform is a result of the Parent in Science movement, started in 2017. Brazilian researchers mobilised and asked CNPq to include the field of maternity leave – a request that was soon accepted, but only implemented in April 2021. Now, scientists who had children can prove to judging committees that breaks in academic production are linked to the period of leave.

Adriana explains that the main government research grants are awarded to those with long and consistent academic track records, and evaluated by different committees, for each of the 49 areas of knowledge. “We cannot create a rule without it also being embraced by the advisory committees, because they work with their own criteria. These scientists asked for a field in the *Lattes* CV to sensitise the committees to consider this period of leave in their evaluations: it is not that women stopped being scientists and researchers, but that they also became mothers. When the criteria therefore take the differences into account, they start to compete on equal terms”, says Adriana.

Media underrepresentation

Brazil is one of the few countries in the world with gender balance in the scientific community, although not in positions of power or even among the highest-level CNPq productivity scholarship holders. However, studies conducted by researchers at the Institute of Public Communication of Science and Technology (INCT-CPCT), based at Fiocruz, show that this is not reflected in the mass media. “For example, a study we carried out on TV programmes *Jornal Nacional* and *Fantástico* clearly refers to a predominantly male scientific universe, with predominantly white and middle-aged leaders. Women’s voices and presence tend to be underrepresented and barely visible, in addition to appearing with symbolic connotations different to those of men”, says Luisa Massarani, science journalist, researcher and coordinator of the INCT-CPCT.

Sabine Righetti has noticed that women scientists requested by the Bori Agency or the press, are more resistant to talk. “Many end up appointing a department head, male, or a mentor, also male, to talk about their own work, and others decline”, she explains. For her, several reasons explain this behaviour, including the overload caused by the work of caring for the family and domestic activities. “Women are discouraged from talking since childhood and, when they take a stand, they tend to be much more criticised than men. We are just now starting a survey with scientists to see if my perception is confirmed”, she says.

To bridge this gap which extends to the public communication of science, editorial practices in relation to gender and diversity are routine at Bori and [SciDev.Net](https://www.sci-dev.net/), of which Luisa Masarani is coordinator for Latin America and the Caribbean. “In the search for themes, we seek to look at issues of interest to diverse communities and with gender perspectives. When selecting our interviewees, we also take this into account”, explains Luisa.

Bori proactively seeks diversity in different areas, spokespersons, and regions of the country. In 2020, the agency advertised a job every two days, of which 55% had women as spokespersons. “It’s no use just mapping women, black or scientists from the North of the country if we don’t do press awareness and train these researchers to talk to journalists. Now, at Bori, we are designing two projects particularly in this sense”, says Sabine. She also remembers the weight of institutional actions, outside Bori. “How many universities in the country know who their spokespersons are and their distribution by gender and race? How many carry out actions aimed at women and black spokespersons?”, she asks.

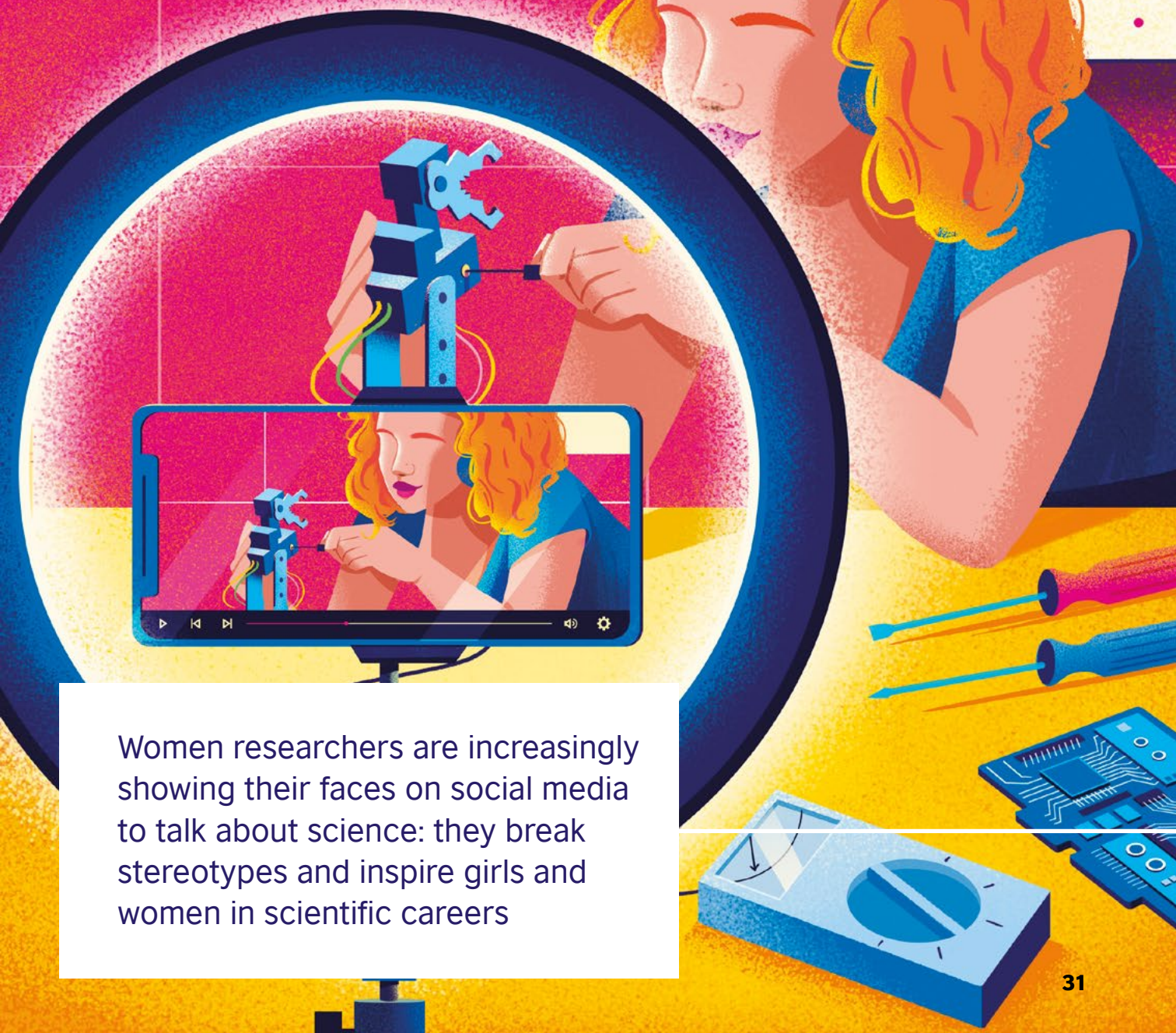
International organisation that produces news, opinions and analysis on science and technology
bit.ly/SciDevNet



Luiza Lages

Illustration: Andressa Meissner

Women scientists and influencers



Women researchers are increasingly showing their faces on social media to talk about science: they break stereotypes and inspire girls and women in scientific careers

A common stereotype still dominates the imagination of who scientists are: an older, white man in a white coat, intelligent, unsociable and typically nerdy. **In a study published in 2014**, Princeton University psychologist Susan Fiske showed that most people find scientists very competent, but not warm nor friendly. This stereotype is a problem when it comes to trusting what researchers have to say, which is compounded by the fact that many people don't know a scientist personally or even see one in action.

In 2017, a group of scientists from the United States and Canada came together to explore whether posting selfies could change stereotypes and increase people's confidence. Then along came the hashtag and the #ScientistsWhoSelfie movement, which circulated in media such as Instagram, Facebook and Twitter. Today, more than 23,000 posts on Instagram have been tagged with the hashtag: they are selfies by researchers from all over the world. Increasingly, scientists are adopting social media as tools to communicate their research and engage wider audiences in scientific discovery and its results.

In 2016, Sendy Melissa was doing her Masters in Condensed Matter Physics at the Federal University of Alagoas (UFAL). She says that at the time, she felt very lonely. "I wanted to share what I was doing with other people who weren't the people around me, and I got to know Instagram @bergerwithasideofcode," she recalls. Jamie Berger is a computer scientist who spoke about programming, algorithms and various technologies. "I found it very interesting when she presented these things, tried to explain it to a more general audience, and shared about her PhD. So, I thought: why not try something like this?", says Sendy.

With the desire to show more spontaneous and dynamic content not requiring the production of videos, the researcher created an Instagram profile, @send.ciencia. She started out shy and, slowly but surely, discovered a universe of science promoters, mainly on YouTube and blogs. "It was only later that I understood that what I was doing was science dissemination. And I started doing it not only because I felt lonely, but also because I liked it, and started meeting amazing people", she says.

Despite her large number of Brazilian scientist and publisher followers, Sendy does not consider herself a great Instagrammer. "It is more common for those who speak about Physics to have many male followers, as they are in the hard sciences. But many women follow me", she says. For her, this is explained by the different themes presented in her profile, such as gender and race. "I like to talk about where I came from, how I got here, and what I went through being a black woman. And this attracts broader audiences, which differ from the white male of the hard sciences", she completes.

Today, with her doctorate, she's not lonely like when she started out, and continues sharing her work with physics on Instagram. The researcher began to study scientific dissemination and communication strategies on social network and understood that she needed to define a persona. "I want my audience to be young. My persona is therefore based on former students who follow me, from the communities in vulnerable regions, because I live and always taught there", she explains. It is these young people that she thinks about when building a text, working with a specific language and when talking about science.

bit.ly/estereótiposcientistas



“I always try to use elements that have to do with the female universe. For example, using pop songs or Brazilian funk songs, because I know my students really enjoy it. I make comparisons or try to explain some part of the discussion there,” says Sindy. In addition to physics themes, on Instagram she talks about her daily life in the lab and has learned to use the impact that photos can generate. “Sometimes I take a photo of something that is very trivial for me, but people are curious! This is really cool: to see that what is common for us is not necessarily the case for everyone”, she says.

bit.ly/CientistasnoTwitter



Influencer during the pandemic

Throughout 2020 and 2021, science was frequently mentioned in the news, in conversations and on social network. A [survey](#) by the Laboratory of Studies on Image and Cyberculture (Labic), of the Department of Social Communication at the Federal University of Espírito Santo (UFES) on Twitter, shows: in 12 months, the number of self-declared scientist influencers has doubled and have tweeted using terms such as COVID, Coronavirus, vaccine, pandemic, COVID-19, quarantine, isolation, and lockdown.

The COVID-19 pandemic led scientific interlocutors to share information about the virus on social media. One of these scientists is biologist Rafaela Ribeiro, Master and Doctor in Cellular and Structural Biology. In March 2020, when the pandemic was announced by the WHO, Rafaela was part of a research group at the San Raffaele Hospital in Milan, Italy – the epicentre of the disease at that time. She was researching the Zika virus, but the focus of her studies changed. “Italy was one of the first countries in the West to be hit by COVID-19, so we were one of the first laboratories that ended up migrating the experimental part, dedicated to Zika and Sars Cov-2”, she recalls. She was invited to join the team to test drugs. “It was a moment of great learning, because I was able to closely monitor the construction of knowledge in the midst of a pandemic, inside a hospital. I had a lot of access to discuss and understand the virus’s behaviour and the patients’ characteristics”, says Rafaela.

At the end of 2019, the biologist had created an Instagram account with the aim of presenting concepts and explaining what happens in the human body: for example, what a cell is, what DNA is and what we are biologically made up of. “It was a hobby and when the epidemic appeared in China, I turned to my Instagram. I ended up doing lives, videos and posts about the epidemic, and about what a new virus is”, she recalls.

Also seeing an increase in the circulation of fake news, the researcher decided to dedicate her Instagram almost exclusively to information and explanations about COVID-19. “In the pandemic, while in Italy, this Instagram page was a relief for me. While I was isolated in lockdown, it was a form of connection”, she explains. At that time, Rafaela became a familiar voice in the mainstream media, sought after as a source by the Brazilian press, and began collaborating with actions of spreading knowledge. Today, the researcher is back in Brazil and studying the Zika virus.

//“I don’t even like saying that people need to believe in science, because it’s not a belief. Science is something you learn - you understand how it works. Talking about science is to understand that our society needs to understand this knowledge.”

Over time, her Instagram profile changed from @ciensouu to: @dra.rafa-ribeiro taking on her professional title as a scientist. “I started wearing my name more. I think this movement is very important. I don’t want people to call me ‘Doctor’, on the contrary, I want to be called ‘Rafa’. But putting the ‘doctor’ in front is an appropriation of what I am professionally. As my Instagram account is professional, I gave it my face, my profession”, says the biologist. She says she records videos and takes photos to answer questions, responds to followers via direct message and seeks to convey information clearly and quickly.

An invitation on the edge

Both Rafaela Ribeiro and Sendy Melissa balance their work as researchers with content production and profile management on Instagram – and they have no intention of abandoning one or the other. “I enjoy doing research, being in the lab, and reading articles. I like the edge, this place you’re at when you’re about to discover something new: you know a little bit and if you go a little too far over the edge, you don’t know anything. And I also like to show what this edge of knowledge is,” says Sendy.

For Rafa, finding time to dedicate to social media is a challenge, but she sees it as her way of giving back to society. The biologist believes that, when talking about science, she contributes so that knowledge reaches more and more people. “I don’t even like saying that people need to believe in science, because it’s not a belief. Science is something you learn - you understand how it

works. Talking about science is to understand that our society needs to understand this knowledge”, she adds.

Both researchers believe that combining the roles of scientist and digital influencer is about representation and inspiration, especially for girls and women. “It’s a matter of seeing the scientist in different people from different origins, far beyond that old, white man with messy hair. People are often surprised when I say at school: young, black, woman, it’s not that old stereotype. And this causes a stir. Not everyone has to like science or want to be a scientist, but just showing that there are different people in the area, and that there must be different people, is enough”, Sendy concludes.

//“It’s a matter of seeing the scientist in different people from different origins, far beyond that old, white man with messy hair.”



Ink, pencil, paper and Instagram

On many of the walls of London buildings, blue signs indicate that a famous personality, considered a reference in their field, has lived or worked there. While studying in London, biologist Nina Chita began researching the names of people indicated on the signs she found in her path. As she read about them, she sketched their portraits. Soon, she became more interested in women scientists. “Coming from a scientific background, I was always interested in learning about researchers. I started drawing women in science as a way to discover their stories and contributions”, she says.

The biologist discovered that she was not the only one who knew so little about women scientists. According to a **Teach First survey**, less than half of the British public can name a scientist. This is due to the lack of inclusion of women scientists in education. “A study of seven commonly used textbooks for introductory biology in the US highlighted that no black women were included in the references. Seeing this abyss of representation is a great motivator to illustrate women scientists,” Nina adds.

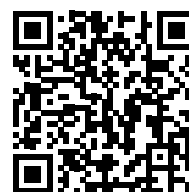
With a Master’s degree in Developmental Biology, Nina moved to Vancouver, Canada, in 2019 to work for an NGO as a writer of educational materials for healthcare professionals. During breaks, she takes gouache, pencils and ink pens from her drawer and draws female scientists. “It’s important to include contemporary and historical scientists, and women with intersecting identities. I make a point of illustrating these women alongside words like ‘teacher’, ‘doctor’ or ‘engineer’, to challenge society’s beliefs about the appearance of a scientist,” she says.

bit.ly/citeonomedumaciencia



All this work lands on Instagram and Twitter profiles (@nina.draws.scientists), where Nina draws attention to the stories and achievements of the researchers she has drawn. “Social media has its pros and cons. The big advantage is that it is freely available, accessible and has a global audience. I use Instagram and Twitter so that others can understand the contributions women have made to science, especially women from racialised backgrounds, and to demonstrate that gender does not affect scientific capacity,” says Nina.

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in Science podcast
featuring the
interviewees in this story**





Mariana Alencar

Illustration: Andressa Meissner

Women on the top

Developing interpersonal skills helps women overcome obstacles and excel in STEM careers



By exploring different work possibilities, engineer Amanda Ohara found satisfaction in her journey by dedicating herself to the renewable energy sector. For 10 years she worked at Petrobras, Brazil's giant multinational petroleum corporation, resigned and ended up in the Amazon region to learn about medicinal plants from an indigenous healer. Joining these experiences, she decided to start her own business in the area of renewable energy and energy efficiency. With a friend, she set up a consultancy that developed work for institutions and companies in the sector. Today, Amanda Ohara is the technical coordinator of *Instituto E+ Transição Energética*, a civil society organisation focussing on Brazilian energy transition.

While her plural experiences led her to leadership roles, they did not shield her from experiencing obstacles in the labour market. When recalling her journey, she reports the events in which her competence was questioned by colleagues. "Once I was up for a promotion, and my manager chose my colleague instead, who, until then, held the same position and had the same professional performance as me. His justification was that being a man, my colleague would know how to deal better with conflict. I felt inadequate," says the engineer.

The need to deal with the questioning of their skills and abilities is an all-too-familiar task for women who perform leadership activities, especially in the STEM areas. Social structures have historically created the idea that women are not fit for the role of a leader. Leadership is further defined in male terms, and gender inequality in occupational terms becomes more acute as it moves towards the top of corporate organisational ladders or academic structures. Proof of this is that women account for 54.5% of workers in Brazil. However, only 37.4% hold leadership positions, according to a 2019 survey by the Brazilian Institute of Geography and Statistics (IBGE).

//“I’m a lesbian woman who doesn’t act feminine. So, I’m basically the opposite of tech executives who are mostly older, white, heterosexual, middle class men. I had to learn to have confidence in myself to deal with this.”



Credit: Mariana Smania

At 25, Maria Queiroz’s career spans 8 years. Despite her young age, Nubank’s Senior Business Analyst has already experienced challenging situations due to gender stereotypes. “I have been affected by three things in my career. The first one is my gender. When you walk into a room with ten people and you’re the only woman, you notice the existence of a structure of power. The second factor is my age. Since very young, I have been among older executives and haven’t been taken seriously. Also, I’m a lesbian woman who doesn’t act feminine. So, I’m basically the opposite of tech executives who are mostly older, white, heterosexual, middle class men. I had to learn to have confidence in myself to deal with this”, she comments.

Both the traditional corporate market as well as the innovation and technology ecosystems around the world operate through structural logics marked by gender inequality. The “rules of the game”, as defined by the diversity, equity and inclusion consultant Talita Matos were created from patriarchal ideas that only began to dissolve recently.

“Over the last 20 years, we have seen an inflection of absurd changes in the market. These are increasingly rapid transformations that have forced companies to shift their actions centred on the company and its shareholders to serve society. And consumers are diverse, they are people of different gender, races, social classes, etc. To serve the diverse market well, companies also need to diversify”, comments Talita.

//“Consumers are diverse, they are people of different gender, races, social classes, etc. To serve the diverse market well, companies also need to diversify.”

However, even as the number of women on a corporation's staff increases, they are still a minority in leadership positions. For Talita Matos, the reasons for such disparity are linked to explicit and implicit cultural barriers in the daily lives of companies. "The barriers are updated and renewed. The action of removing them is permanent. And this is only possible if you actually have a diverse group identifying and solving problems with intentionality", she points out.

The Power of Emotional Intelligence

Gender inequalities appear in childhood through a series of symbols, behavioural impositions and forms of socialisation that interfere both in the association between leadership and the male gender, as well as in the common belief that women are less competent in exercising strategic functions and those related to rationality. The division between a girl and boy's toy acts as a metaphor in this process: while male children are stimulated with logic, puzzle and math exercises, female children have activities that refer to housekeeping, for example. "Throughout our lives, we women are exposed to a series of symbols and situations that help us create limiting beliefs. I grew up believing I was not good at math. Therefore, the work of self-knowledge is very important", emphasises Talita Matos.

The construction of beliefs caused by socially imposed barriers make women feel more insecure in the labour market. According to the study **Gender Insights Report** released by LinkedIn, in 2018, women tend to apply for a position only if they fully meet the requirements. Among men, having only 60% of the skills is good enough to apply for the position.

Given this scenario, knowing what their real strengths and difficulties are is important for women in their professional or academic careers. Interpersonal skills are related to communication and interpersonal relationships. Developed through self-knowledge, these skills are fundamental requirements for those occupying leadership positions. In this context, some even say that self-knowledge is the new English for the labour market.

Check out the LinkedIn survey, Gender Insights Report - How Women Find Jobs Differently, at bit.ly/genderinsightsreport



//“Many do not believe they are capable and do not have other women as a reference. We need more self-confidence.”

To encourage other women to develop self-awareness and self-knowledge, Maria Queiroz, Senior Business Analyst at Nubank, has been mentoring people who intend to enter or migrate to the technology area, for a period of 2 years. Most clients are women who are very insecure about taking up activities in this market. Maria has realised during her career that it is not hard skills - those traditionally considered masculine - that distance women from leadership positions, but professional self-esteem. “Many do not believe they are capable and do not have other women as a reference. We need more self-confidence”, she comments.

To enhance the interpersonal skills of women during mentoring, Maria uses the “personal canvas” method, which makes it possible to identify skills, weaknesses, behaviour and general characteristics. According to her, the noting down of skills is powerful, since a personal or professional desire travels from the mind to a piece of paper materialising into a real objective to be achieved. However, the practice of self-knowledge and self-confidence does not happen spontaneously. It is a long process that requires dedication along with the development of technical skills. “During my mentoring, I realised that a lot of what I say to people, I don’t apply in my own life. Sometimes we don’t notice our own journeys. I have a career of 8 years under my belt, and still, I sabotage myself and doubt my capabilities. At times like these, I look for references,” says Maria.

Together we are stronger

The development of interpersonal skills is not only linked to self-knowledge. This process is also associated with the creation of a support network among women. The search for inspiration and reference is a way for women to feel capable. Consultant Talita Matos emphasises

that sharing experiences about career, family, motherhood, and money is a strong pillar for improving behavioural skills. “So it’s important to have women’s groups that function as a place of safety and respect, where we can learn, tell our stories, and push each other to grow in our careers,” reflects Talita.

In this scenario, social network is an ally for women. Today, it is possible to find groups with specific themes, such as finance or marketing, based on a gender perspective. “I look up women in leadership positions from my contacts list who I respect and honour. I call them up for a conversation and ask for mentoring. It’s a really cool process, people respond, and we connect,” she shares.

Despite the power involved in meeting women, care must be taken so that inspiration does not become an unnecessary comparison. The reduction of a complex and particular journey to just one aspect is called the “danger of a single story” by Nigerian writer Chimamanda Ngozi. When a woman compares herself to another and finds herself incapable, she must consider that each one has their own experience. “When we look at our referenc-

es, we tend to want the other person's story to be ours and we start trying to follow that other person's journey. But we are different people, and each story is unique", comments the systems analyst, developer and researcher **Anicely Santos**.

Awareness of the importance of connections for the development of interpersonal skills led this woman from Pernambuco, Brazil, to join networks that rely on the exchange of experiences as a form of professional development. Anicely is part of "Afropython", an empowerment network for the black technology community, and "*InspirAda na Computação*", a collaborative virtual space that seeks to unite women from the STEM area. "In the area of technology, especially, we cannot think that we are alone within the profession. We have to understand our bonds with other people. I am very grateful to the communities that exist and all the strength they have given me to keep me on this path, because as a black woman, it's a very difficult one," says Anicely.

Replicated skills

In order to develop leadership skills for women in technology, the **British Council** promotes the capacity building course "Women in Tech: Inclusive Leadership". Training is offered to institutions that aim to enhance women's interpersonal skills to increase diversity in leadership roles. Online training activities are divided into modules and are performed both synchronously and asynchronously.

The training was built in partnership with Developing Inclusive and Creative Economies (DICE) to be customised based on the institution's objectives and replicated in different contexts. There are 13 modules focused on topics such as self-knowledge, leadership, diversity, digital presence, networks and partnerships, conflict transformation, entrepreneurial mindset, access to capital and support, digital transformation, mental well-being, multiplication and mentoring, and building the future. Amanda Ohara, Maria Queiroz, and Talita Matos helped building the training, acting as content development consultants.

Listen to the Women in Science podcast featuring the interviewees in this story



During the 2020 edition of Feira Preta, a black culture festival that has the support of the **British Council**, Anicely Santos participated in the panel "Computational Thinking: Far Beyond the Codes", with computer scientist Nina da Hora, and by researcher Clécio Santos.

STRATEGIC AGENDA



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Long live to the women in science

Luana Cruz

Illustration: Andressa Meissner





Women in Science expands operations and transforms to ensure the continued strengthening of networks in Latin America

The **British Council's Women in Science** programme has grown in territory and influence. During its three years of existence, the programme has planted seeds, generated interests and brought different institutions together to expand networks of women in science. The strengthening of this life cycle as a structural part of the **programme in Brazil** resulted in the regional expansion to Peru and Mexico.



Learn about the actions of the Programme developed in 2018 and 2019 in previous editions of the WiS magazine bit.ly/revista1WiS and bit.ly/revista2WiS.



//“The inspiration and interest of these girls will generate engagement to attract more women into scientific careers and, based on that, contribute to reducing the gender and diversity gap in science.”



Crédito: Divulgation

“These are countries that are already working with this agenda and that have stakeholders with an appetite. This opportunity represents, for us, having partners in different countries talking about these themes, wanting to take advantage of our experience in Brazil and actively participating in the discussions”, assesses Diana Daste, Acting Regional Lead Higher Education & Science / AMERICAS. For Diana Daste, the programme continues to follow its timeline, guided by inspiration, interest, recognition, performance, leadership and influence. “This will always be the strategic agenda because it is the conceptual framework of our programme and what we focus on is the strengthening of each of these pillars and the integration between them to really have a comprehensive proposal, which can connect and have impact from different interventions”.

Especially in 2020 and 2021, **Women in Science** looked at the emerging social demands and the prominence that science received in the context of the new Coronavirus pandemic, considering the challenging scenario that fed the programme’s maintenance. Discussions on diversity and intersectionality were also strengthened, with a focus on vulnerabilities that can impact women. Looking at the future, the programme aims for a moment of digital change, identifying a specific offer of essential skills, mainly for girls and young scientists, that promotes alignment with the current context and an inviting window to enter scientific-technological careers.

The **strategic evolution of the programme** is aimed at consolidating the UK Americas Women in Science Association and its thematic groups, in addition to hosting the 20th edition of the Gender Summit and harvesting more practical results in terms of public and institutional policies. According to Diana Daste, there is a great effort to integrate more girls into science today. “We are going to work strategically with this life cycle perspective, understanding what the practical and tactical elements are in order bring offers to girls. The inspiration and interest of these girls will generate engagement to attract more women into scientific careers and, based on that, contribute to reducing the gender and diversity gap in science”.

Expansion and integration

The **British Council** mapped the main **actors and connections** in Peru and Mexico for a strategic integration of **Women in Science**. The focus is on supporting the networking and skills of young scientists. In addition, it aims to foster girls' interest about STEM activities and disciplines, supporting them in choosing and staying in STEM education, offering tools for young professionals working in these areas to reach leadership positions, as well as networking with peers in their region and in the UK.

“In the case of Peru, we are carrying out mentoring programmes and understanding how to strengthen networks and the exchange of experiences and the most important debates. From there onwards, we will generate an offer of support among the different network participants. In Mexico, we are thinking more about digital offerings to strengthen girls' and women's access to science. In Brazil, we are going to expand a specific offer via engagement and teacher training, in addition to expanding the digital offer”, explains Diana Daste.

According to her, this is the tone of what the **British Council** is designing for regional expansion. Other countries are on the radar, always considering the flexibility of these locations in linking to the programme, having as a strategic framework for Women in Science the attention to understanding the relevant actions that make the most sense for the different contexts. “All of this is done participatively and collaboratively aligned with those processes of the pillars of influence, meaning the consolidation of work groups and definition of the duration of processes, reaching different milestones to measure, monitor and redefine different moments”.

Gaps in the scientific ecosystem in Peru

Data from the National Registry of Science, Technology and Technological Innovation (**Renacyt**) of Peru in 2021, point to an increase in women's enrolment in universities, corresponding to a greater participation in STEM areas. Among researchers registered in the Concytec database, the percentage of women with higher education has grown from 30.92% to 45% in recent years. However, when looking

Data available at
bit.ly/RENACYT



at the total number of scientists registered with a higher level of qualification, according to **Carlos Monge's classification**, women represent 27% of this group. Even in Academia they perform administrative roles, teaching at junior level or as research assistants, while the top positions in Science and Technology are still dominated by men. Another gap in Peru's scientific ecosystem is that most researchers are in the capital, Lima, and are between 40 and 59 years old.

Qualification system that aims to recognise the professional conditions in which research is carried out in Peru. The Carlos Monge group is made up of professionals with exclusive dedication to research, while the Maria Rostworowski group includes those with shared dedication between research and other professional activities.

Currently, Peruvian legislation considers gender equity to be important, but operational instruments for institutional application in academia, government, the business sector, and civil society are lacking. Science and innovation is still a **small sector in Peru**, with 6,000 researchers in total, and the representation of women (45%) lower than that of men (55%). However, for past three years, debates about the importance of the participation of women scientists have intensified and there is interest, on the part of Concytec and other institutions, for this agenda to have more concrete political commitments.

According to data from Concytec, Conacyt and Unesco, in Peru there are about 125 researchers per million inhabitants, while Brazil has approximately 700 and Mexico 240.

In this context, **Women in Science** brought two priority lines of action to Peru. The first, to strengthen inclusion in Science and Technology with the dissemination of materials such as the mentoring manual in Higher Education and the user guide in S&T; the monitoring and evaluation of mentors certified in the Mentoring course; and calling for the involvement of other key actors who promote women's agenda in science. The second line aims to promote alliances with UK actors such as Portia and Advance HE, in addition to developing a proposal for regional collaboration in the Americas.

//“Science and innovation is still a small sector in Peru, with 6,000 researchers in total, and the representation of women (45%) lower than that of men (55%).”



The proposed action of the **Women in Science** programme in Peru is expected to last approximately four years and, slowly but surely, the field of action is growing. The Women and Girls in STEM project contributes to alleviating the social and economic inequalities faced by women and girls, giving them tools to increase their knowledge and skills, as well as strengthening their sense of entitlement, self-esteem and confidence. The **British Council** Scholarships for Women in STEM programme is supporting women who want to continue their professional development and thereby inspire future generations to pursue careers in STEM.

With regards to its capacity building dimension, **Women in Science**, thanks to its alliance with Concytec and resources from the British Embassy, initiated technical assistance to professionals in order to promote practices that reduce inequality in the scientific ecosystem. With the leadership of Elizabeth Pollitzer, founder of Portia, and the participation of key actors from both the public and private sectors, a preliminary roadmap was produced to accelerate the political and economic conditions for women's participation in science.

Also, in the line of training, the Programme for Promoting Inclusion in the S&T Ecosystem, in alliance with Concytec, held the Course on Introduction to Mentoring in Higher Education with the objective of reducing gaps and strengthening the capacities of scientists and researchers in the capital and from regions in the interior of the country. The course was taught, in virtual format, by Debra Croft, a specialist in mentoring programmes in educational organisations and a consultant for **Advance HE**.

The gender dimension in Mexico

Mexico's turning point in discussions about gender and science came in 2016, when the country hosted the 8th Gender Summit North & Latin America with the theme "Science without borders: improving impact across gender, geographic, disciplinary and educational dimensions". The following year, the Gender in Science and Innovation workshop took place, which addressed the inclusion of the gender dimension in scientific research projects, in team building, in funding agencies and in evaluation committees.

British organisation, reference in structures of excellence in higher education in the United Kingdom with a focus on education for sustainable development.

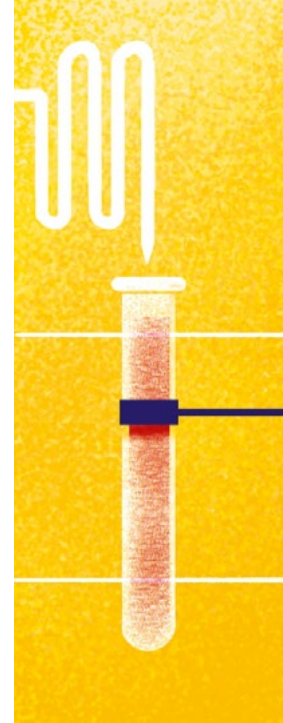
The **British Council's** work in Mexico is based on the concept of the gender dimension, which refers to integrating gender analysis into research methods and content, at all stages. The idea is for researchers to start questioning norms and stereotypes, the roles and needs of women and men, the reference models, methodologies and standards that are often used uncritically in scientific endeavours. In Mexico, there is considerable awareness of the need for more women in science, particularly in disciplines such as careers in STEM. However, there is no real understanding of the implications of not having women in these areas and they themselves are not familiarised or sensitised, and do not even know how to apply the gender dimension in their research. Although the topic is already in discussion, the concept has not permeated funding agencies nor research centres.

Integrating the gender dimension in research enhances the scientific quality and relevance of the social impact of the results, taking into account populations directly or indirectly affected, and makes it possible to generate innovations. The gender dimension is also a matter of justice and part of the ethical commitment to research, which favours the efficient use of resources allocated to scientific research and technological development.

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With this in mind, **Women Science** in Mexico seeks to influence various sectors: education, government, business, civil society and local and international organisations. The first action point happened with the Women and Girls in STEM programme, helping to build a culture of inclusion of more Mexican girls and women in STEM activities and careers. The benefit has already been noticed not only for programme participants, but for their families and society in general.

Mexico is a diverse country of large territorial dimensions. Actions to promote science nationwide are associated with initiatives in each of the 32 states of the Republic. The **British Council** has collaborated with organisations to promote new teaching methodologies in STEM fields. The STEM Basic Skills Programme, in conjunction with the Mexican Academy of Sciences, was implemented in 2018, with the aim of developing soft skills through training packages for teachers, coordinators and principals.



Another point of action is the STEM Certification, based on training that disseminates STEM teaching methodologies, such as research-based learning and a collaborative approach adapted to the context of teaching in Mexico. There is also the regional Girls Power CodeFest Americas project, which promotes technology training for girls in Pacific Alliance countries (Chile, Peru, Colombia and Mexico).

In an intervention contextualised to the new Coronavirus pandemic, the **British Council** created the *Metaverso* project in 2020, an immersive virtual reality platform in which young students from Mexican schools can interact with mentors specialised in science, technology and entrepreneurship. The platform can be accessed simultaneously and remotely by up to 100 participants. The project's general objective is to promote the social and educational context in which girls and women are encouraged and recognised, aiming at the eradication of gender stereotypes and digital inclusion actions.

For the pilot edition of *Metaverso*, schools needed internet access. The institutions received information technology and technological equipment to operate the platform. Five schools from the National College of Technical Vocational Education (Conalep) located in Campeche, Guanajuato, Quintana Roo, Querétaro and Mexico City were selected. The chosen institutions are located in communities marked by alerts of epidemiological seriousness for Covid-19 and by educational delays. The students had the chance to interact virtually with renowned scientists, technologists, and entrepreneurs.



Strategic agenda to strengthen behaviour

1. Reinforce the three pillars (performance, influence and leadership) and the integration between them in a deeper and more visible offer, through the strengthening of groups, events and through the work of the UK Americas Women in Science Association

2. Progress regionally without losing sight of the link with the United Kingdom

3. Strengthen both ends of the Women in Science lifecycle.

On the one hand, to broaden the interest and engagement of girls, identifying actors who can help in this task, whether teachers, families, or society. At the other end, having networks with more cohesive behaviour and identity that have a clear proximity to the programme and generate opportunities.



Strategic actors: local initiatives, actions, and mobilisations



National Council for Science, Technology and Technological Innovation (Concytec): through the Pro-Women in Science, Technology and Innovation Committee (CPMCTI) in 2021, it works with mentoring proposals, supported by the **British Council**, to train men and women researchers to mentor university students in their final years of training, or professional women at the beginning of their careers; and implementation of communities at university and technical levels, which generate integrated learning and scientific culture, functioning as scientific seeds for innovative women's projects.

Pronabec: scholarship programme aimed at Peruvian high school students, encouraging entry into STEM careers.

Ministry of Women and Vulnerable People: commits to the annual recognition of women through contests, publications, cash and non-cash awards.

Centre for Responsible Leadership in Women and Equity: promotes research aimed at socially responsible leadership, promoting diversity and equity in the business world. It encourages debate on the insertion of women in the country's economic activity and generates tools to develop Peruvian women's managerial skills.

PERU

Department of Public Education (SEP): in 2018, they launched Niña STEM Pueden, an initiative that promotes the interest of girls and teenagers in different careers related to STEM areas.

National Autonomous University of Mexico: created the Internal Commissions for Gender Equality (CInIG's), with the objective of promoting the implementation of the institutional gender equality policy of the university and preventing any type of discrimination and violence for reasons of gender.

National Science and Technology Council (Conacyt): body recognised for incorporating the gender perspective in its recruitment, selection, mobility, and training processes. It has programmes aimed at training women scientists, affirmative actions that consider motherhood in the academic career and fostering research on gender.

L'Oréal Scholarships for Women Scientists: since 2007, the Mexican Academy of Sciences, L'Oréal-México and the Mexican Commission for Cooperation with Unesco (Conalmex) have offered scholarships aimed at promoting the participation of women in the realisation of advanced scientific studies in Mexican universities and other institutions.

Women leaders in STEAM: promote leadership opportunities. It has the support and participation of a network of mentors, professionals with extensive experience and committed to supporting the development of future generations of women.

Mexican Science, Technology and Gender Network (Mexciteg): created to develop academic and research works that allow understanding the dynamics between science and gender, as well as the participation of women and men.

STEAM Movement: non-profit association that promotes "STEAM education" with a focus on scientific and mathematical thinking aimed at innovation, with a social and inclusive vision.

MÉXICO





Charisma, content and clarity

Mariana Alencar

Illustration: Andressa Meissner

Brazilian scientist Gabriela Ramos Leal makes history at FameLab 2020 and shows that enthusiasm is essential when talking about science

What do Disney movies have to do with insulin production? And Captain America with embryo preservation? At first, it is difficult to correlate these issues, but this was the strategy used by veterinarian Gabriela Ramos Leal during the national and international phases of **FameLab 2020**, the world's largest competition for scientific communication. The event, held in 32 countries by the **British Council**, aims to promote closer ties between scientists and general audiences, through the approach of scientific themes, and to encourage the development of communication skills.

Master and Doctor in Clinical and Animal Reproduction from the Fluminense Federal University (UFF), Gabriela took a long time to realise her interest in science and scientific communication. As an undergrad, what motivated her was her passion for animals and the desire to take advantage of everything the area offered. In the final years of the course, curiosity was what drove her to enter academic life. Embryology was the chosen area and, during her graduate years, Gabriela researched in vitro production in cattle to optimise the productivity of dairy herds.

Gabriela's passion for veterinary medicine fills the eyes of any spectator. The hurried and intense speech is added to the researcher's broad smile of excitement as she recalls her story. "I've always liked to communicate. I talk a lot. I think that's why I ended up becoming a professor too", jokes the professor at the Castelo Branco University. Gabriela's impetuous involvement with science and the researcher's peculiar curiosity made her story intersect with FameLab.

"In 2017, I was about to go to Australia to do my PhD sandwich I received an email informing me about the FameLab final. I didn't quite understand what it was about, but I decided to go anyway, out of curiosity. I was in love with the competition at that time. I came home already thinking about applying for the following

Comic book character who is found alive 70 years after being buried in ice during World War II.

year, but it didn't work out, as I wasn't in Brazil. In 2020, I was already sure that I wanted to participate," said Gabriela.

Improved Skills

In her entry video, the scientist wore a **Captain America** T-shirt and spoke about the ability of low temperatures to preserve gametes and embryos. She was one of 30 candidates selected for the semi-final of the 4th edition of FameLab Brasil held in 2020. Gabriela and the other candidates received training in scientific communication given by Ronaldo Christofoletti, biologist at the *Instituto do Mar* of the Federal University of São Paulo (Unifesp), and Wendy Sadler, British science communicator and lecturer at Cardiff University and founding director of Science Made Simple.

Through virtual meetings, the training addressed basic communication concepts – understanding the audience, structuring the script, choosing the language – and assisted the competitors in recognising their own skills. "It's very im-

FameLab was launched in 2005 by the Cheltenham Science Festival in England. In Brazil, the initiative is in its fourth edition and has a partnership with the Ministry of Science, Technology and Innovation (MCTI), through the National Council for Scientific and Technological Development (CNPq), the Brazilian National Council for the State Funding Agencies (Confap), and The São Paulo Research Foundation (Fapesp).

portant for me to develop new talents in science communication. I think scientists have difficulties in the public communication of science, because they are trained to speak in a certain way and, in science communication, they need to change that. So, training scientists is a challenge because you need to teach them to let go of things they are used to. You need to teach them how to step back and identify the main research problem, to use less technical language so that they can communicate with different audiences,” comments Wendy Sadler.

After training with Ronaldo and Wendy, the 30 participants did their digital three-minute presentations, live, in front of an evaluation committee that watched them in the *TV Cultura* studio, where the semi-final and final stages were recorded. The remote presentation format was first adopted as a result of the pandemic. The top 10 candidates were then selected for the final, when, again, they synthesised scientific themes in a video call to the judges. Gabriela was the winner of the national stage and became the Brazilian representative in the international stage of the competition.

One of the judges at FameLab Brazil was Mariluce Moura, journalist and coordinator of the *Ciência na Rua* project and creator of the *Pesquisa Fapesp* magazine. She defined the competition as “a fantastic challenge for the democratisation of knowledge”. In her career spanning more than 50 years, Mariluce has already been a member of the jury of public communication events in science in Brazil and Latin America and was enchanted by the way that



Credit: Léo Ramos

Mariluce Moura,
journalist, project coordinator *Ciência
na Rua* and creator of the magazine
FAPESP Research

// “It’s very important for me to develop new talents in science communication. I think scientists have difficulties in the public communication of science, because they are trained to speak in a certain way and, in science communication, they need to change that. So, training scientists is a challenge because you need to teach them to let go of things they are used to.”

// “Sharing knowledge is vital to the social process and researchers are an integral part of it. I imagine that, encouraged in this way, these young scientists will transmit information extremely clearly. And, in doing so, they contribute a lot to the dissemination of knowledge throughout the social fabric, by so many and different groups.”

FameLab Brazil competitors used resources from everyday life to address scientific issues. “Sharing knowledge is vital to the social process and researchers are an integral part of it. I imagine that, encouraged in this way, these young scientists will transmit information extremely clearly. And, in doing so, they contribute a lot to the dissemination of knowledge throughout the social fabric, by so many and different groups”, shares Mariluce.

Smile on the face, mission accomplished

During the international phase of FameLab 2020, Gabriela competed with nine other finalists from different nations: South Africa, Australia, Kazakhstan, South Korea, Egypt, Malaysia, Qatar, the United Kingdom and Switzerland, among the 20 that participated in the edition. She received the award in the “Audience Vote” category. The overall award was won by the representative of Switzerland, Saradeep Majumdar.

The scientist recalls the nervousness and pressure she felt during the international stage. “Brazil was the only country from the Americas in the competition. So, I was concerned about not doing anything ugly. The expectations were very high, but I managed to do a job I’m proud of. The audience vote was the best response I could have had.”, comments the scientist.

The victory in the category “Audience Vote” took the researcher by surprise, even after using her networks to ask friends and family for votes. The repercussion was such that even the event’s presenter, Briton Greg Foot, was delighted with the massive participation of Brazilians: “The chat is crazy! Lots of comments about Gabi,” he said during the live broadcast via YouTube.

The engagement of the audience seems to have been a response to Gabriela’s passion for science, such a strong characteristic of the researcher that it made a mark not only the spectators but also the trainer, Wendy Sadler. “The categories judged by FameLab are content, charisma and clarity. Gabriela was absolutely fantastic in everything. Especially in the charisma category. I remember the passion and enthusiasm she showed for her own research. Her smile was absolutely contagious! A lot of content was presented. It was well structured and well-rehearsed, and her energy was phenomenal”, comments the presenter.

An illustration featuring two women in the foreground, looking towards the left. The woman on the left has short white hair and is wearing a dark blue jacket. The woman on the right has dark skin, wears a purple headscarf, and a blue patterned top. In the background, there are several wind turbines on the left and a stylized landscape with green hills, a winding path, and a large green tree on the right. The sky is a mix of light blue and white. The overall style is modern and artistic, with a focus on environmental themes.

CLIMATE

Facets of climate change

Verônica Soares da Costa
Illustration: Andressa Meissner

Communication on the context of the global climate articulates a series of issues that go beyond science and involve culture, society, history, politics and economics

The document “The Threats of Climate Change is not Gender-Neutral” by Women Watch / UN Women can be accessed at: bit.ly/ONUClimateChange and points out that gender-sensitive responses in the context of climate change must involve women as agents of change in areas such as energy, technology, and mitigation financing, as well as promoting gender equality in emergency measures during natural disasters.

2020 was the warmest year on record globally, but the information appears to have been eclipsed by the COVID-19 pandemic. According to the National Aeronautics and Space Administration (NASA), 2020 was tied with 2016, the year of previous record high temperatures, with a global average of 1.02 degrees Celsius warmer than the 1951-1980 benchmark. This increase may seem small, but it heralds catastrophes associated with the planet’s continuing long-term warming trend, related to the increased recurrence of natural disasters such as pandemics, cyclones, and floods. In addition, as several [reports](#) published in the last decade have already announced, the adverse effects of these events are already being felt in areas such as agriculture and food security, biodiversity and ecosystems, water resources, human health, energy, transport and industry.

In many of these contexts, women are more vulnerable to the effects of climate change than men, mainly because they constitute the majority of the world’s poor profiles, and their livelihoods are more dependent on natural resources and threatened by climate change. In addition to adult women, girls, indigenous people, and refugees, especially those living in human settlements and suffering from discriminatory patterns of migration, are among the groups that suffer most from the impacts of climate change. The consequences are also more immediate for those who live in locations with high levels of poverty, urban violence and pollution, a pattern of large global metropolises, with their pockets of poverty.

Faced with this scenario of extremes, Julie Doyle, professor at the University of Brighton, UK, argues that it is necessary to overcome the idea that climate change is merely a scientific issue, recognising them as a complex of issues involving culture, society, history, politics and economics.

//“We need to communicate how culture and society are interconnected in the causes, impacts and solutions to climate change.”

Credit: Divulgação



“We need to communicate how culture and society are interconnected in the causes, impacts and solutions to climate change”.

With over 15 years of research in climate communication, Julie Doyle is co-founder and director of the Centre for Space, Environmental and Cultural Policy at the University of Brighton, co-chair of the Association for Media, Communication and Cultural Studies (MeCCSA) and member of the founding Board of Directors of the International Association for Environmental Communication (IECA). She draws attention to the need to make climate change culturally significant and relevant to diverse audiences, helping to materialise the impacts of the climate catastrophe in the daily lives of all people.

Collaborative work is at the heart of the solution, finding ways of creating more sustainable societies. However, a difficult balance needs to be struck between reporting the ongoing impacts of climate change and communicating the possibilities for significant and hopeful change. “Many scientists are talking openly about the emotional impacts of their work. This helps to move us away from the notion of scientific objectivity towards a more socially incorporated understanding of climate change and climate science”, observes the researcher.

Article “Afterword: Reflections on Humanities Engagements with the Cultural Politics of Climate Change: Histories, Representations, Practices” available at bit.ly/DoyleClimateChange



In Brazil, there are more than 1.7 million girls and women aged 15 to 29 who have not completed high school, do not study and do not have a paid job. More information in the article written for *Gênero e Número*, in 2018. bit.ly/lutapelaeducação



Representativeness matters

In one of [her articles](#), Julie Doyle addresses the role of youth participation in the collective reinterpretation of climate change. Swedish activist Greta Thunberg, for example, plays an important role as a role model for girls around the world, with great media attention in her climate strikes. However, actions such as Greta’s are still far from the reality of girls in Latin America, Asia and Africa who often still have to fight for the [right to education](#). Julie Doyle acknowledges that Greta Thunberg has drawn the attention of younger generations to the impacts of climate change as a result of global political inaction. Their climate strikes have also helped to start a global

youth climate movement, **Fridays for Future**. But Greta's reality is not comparable to that of other young women around the world, especially those from regions with greater climate vulnerability.

"I believe the media focused on Great Thunberg because climate change lacked a 'hero' to shape a compelling narrative. However, identifying a young white heroine simplifies the issue, placing all the attention on one person as the sole holder of the truth, at the expense of other activists", observes the professor, also recalling indigenous activists for climate justice. Still, she believes we can use these different experiences to focus on amplifying the voices of marginalised young people in different national and cultural contexts, as an integral part of climate action, including the right to education. "Girls' lack of access to education must be part of the story of climate change and its solutions. This is fundamental for an intersectional approach to the theme. If we can share different experiences and perspectives among global youth, and among girls and young women in particular, then climate justice will become part of the foundations of climate action," she says.

Digital activism: women and the climate

In preparation for the **COP26** meeting in Glasgow, Scotland, in November 2021, an Instagram profile was created to mobilise the agenda of women in the fight for climate: @sheclimate. The campaign, mobilised through the hashtag #SHEChangesClimate, aims to ensure fair and equal representation of women on the UK leadership team for the conference. The movement's creators, Antoinette Vermilye and Bianca Pitt, mobilised activists and supporters of the women's climate movement and, in the first few months, after successive experiences of dialogue with a variety of people interested in the subject - such as policymakers, activists, scientists, communication experts and journalists - managed to get the COP26 website updated to introduce their team members, thereby showing the gender disparity in the leadership conference.

Movement started in 2018 after 15-year-old Greta Thunberg and other young activists sat in front of the Swedish parliament for three weeks to protest about the lack of action on the climate crisis.

Several actions were taken by the movement aiming to show more women in public positions of leadership during the climate conference. In addition to having co-founded the She Changes Climate movement, Antoinette is a co-founder of the Gallifrey Foundation, working primarily in marine conservation. While attending the Oxford School of Climate Change, she highlighted that climate change is complex and that the audience generally wants a quick and simple explanation. "Our action oscillates between local and global. This makes it difficult to link UK floods to the Arctic ice melt or tsetse fly populations in Africa.

The 26th United Nations Climate Change Conference, initially planned for 2020, was postponed to November 2021 due to the COVID-19 pandemic. Among the topics of discussion is the increase in promises to reduce emissions.

The problem is that climate change affects us all, it has a huge and inexorable effect on biodiversity, but it is invisible”, she details.

Bianca, on the other hand, is an environmental advisor and founder of the Women for the Environment Network, and regrets that the UK COP26 team being announced without women is just one of many examples of how they are left out of decision-making tables. Bianca argues that the movement’s main objective is to have 50% of women leading the UK COP leadership team. “We are not talking about deputies, but at board level. I would also like to see these women chosen for their experience with climate. There are many brilliant women leaders out there who have been working on this issue,” says the activist.

Women have always been at the forefront of environmental movements and in the fight for climate justice, yet they are disproportionately affected by the impacts of climate change, while formal positions of climate leadership are dominated by men. “This implies which voices and perspectives are valued and legitimised in formal decision-making processes,” argues Julie Doyle. Being realistic, the professor comments that it is difficult to build one’s hopes up in relation to the climate summits, which have systemically failed to carry out concrete, fair and necessary actions to mitigate climate change. “Given the racial, gender and class inequalities of the impacts of climate change and COVID-19, I hope that special attention will be paid to these inequalities in decisions about mitigation and adaptation. This will require a more diverse set of voices in discussions on how best to achieve zero carbon societies that put equity and equality at the centre,” she concludes.

//“The problem is that climate change affects us all, it has a huge and inexorable effect on biodiversity, but it is invisible.”

//“Over the years of work, we realised how the patriarchy present in family and community relations, and also in state institutions, disregarded women as subjects with their own will, compromising agriculture by ignoring all the knowledge they have and accumulate in process of changing agriculture.”

The environmental issue is a social issue

With political commitment to transformation for feminism allied to agroecology, agronomist **Miriam Nobre** has been working at the *Sempreviva Feminist Organisation* (SOF) since 1993, and actively participates in the organisation of women farmers. In her work, she deals with issues ranging from domestic violence to the development of awareness of the economic contribution of these women to supporting the family. “Over the years of work, we realised how the patriarchy present in family and community relations, and also in state institutions, disregarded women as subjects with their own will, compromising agri-

Together with the **British Council**, Miriam Nobre developed the project ‘Building capacities and sharing experiences for an inclusive economy’, funded by the Newton Fund.

culture by ignoring all the knowledge they have and accumulate in process of changing agriculture”, she explains.

The backyard, for example, free of the industrial logics of agriculture, has always been occupied by women as a space for experimentation, for the domestication of variants and observation, hence the importance of agroecology as an activity closer to nature, which is more aligned with a perspective of a sustainable future, with balance in the relationship between humanity and the planet. “Traditional communities have so much to teach us because they’ve been observing how nature works for generations and producing foods that come as close as possible to an awareness that nature is cyclical.”

In addition to observing the time of nature as its own rhythm, which does not provide for the extraction of as much as possible with the least resources but, on the contrary, respects the time of regeneration and the natural flow of the life cycle, agroecology is guided by the recognition of the importance of the diversity of species co-existing in a dynamic of balance and support of life. “Farmers also identify many signs in a plant, which is also a way of getting closer to nature: if a plant is being eaten by ants, it is also used to make tea, or it is a medicinal plant”, explains Miriam.

According to her, there is great concern at SOF about “false solutions to climate change”, which removes the control of management over their territory from traditional communities, demarcating areas and placing them in merchandise circuits, simulating an equivalence of carbon credits, as if these communities could not assume an ac-

tive role in the conservation of rivers and territories by remaining in their region of origin.

“On the other hand, these farmers are observing changes in the rainfall and wind regime as a result of climate change, and they have to think about how this destabilises production and demands solutions that go through collective agreements”, she observes. The climate situation, therefore, manifests itself in imbalances that demand efforts based on knowledge that flows from one community to another, without giving in to standardised agribusiness perspectives. “It is necessary to recognise the wisdom that these farmers have in this management, keeping the territory under their control”, concludes Miriam Nobre.

Read more

To understand the perceptions of Brazilians about climate change, the Rio Institute of Technology and Society (ITS), in partnership with the Yale Programme on Climate Change Communication, carried out the national survey “Climate change as perceived by Brazilians”, which included the participation of 2,600 respondents across the country. bit.ly/perceptionclimatechanges

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Climate interventions

Young researchers in COP26 priority areas are joining forces to find solutions for climate change.

Verônica Soares da Costa

Illustration: Andressa Meissner

From the 1st to the 12th of November 2021, the UK hosts the 26th United Nations Conference on Climate Change (COP26) in Glasgow, Scotland. Among the actions in preparation for the event, the **British Council** launched the Researcher Links Challenge Grants – Climate Change, an initiative that allocated resources for the development of bilateral projects between Brazil and the United Kingdom. The projects selected by the call proposed the hold-

ing of interdisciplinary virtual workshops, between April and August 2021, focusing on researchers at the beginning of their careers, aiming to bring together a diversity of profiles interested in finding solutions to climate change. The solutions, which must be aligned with one or more COP26 priorities, such as Adaptation and Resilience, Nature and Energy, amongst others, also need to be in line with the United Nations Sustainable Development Goals, in particular, Goal 13 (Climate Action), contributing to the global goals of combating the climate catastrophe. Relevant results will be presented at COP26.

Among the projects selected by the **British Council** call, two initiatives by Brazilian researchers focus on urgent issues for the national scenario: the empowerment of traditional communities in coastal regions in the face of the climate crisis; and the relationship between sustainability and school meals. Find out more about the proposals:

It is a multi- and interdisciplinary laboratory with interests in ecology, applied conservation, biogeography, science education and communication that incorporates ideas and frameworks from diverse disciplines (including the social sciences) to better address fundamental issues such as extinction, declining populations, and the impacts of climate change on biodiversity. Find out more about it at: bit.ly/projetolacos21



Traditional communities and the climate issue

Led by Professor **Ana Cláudia Mendes Malhado** from the Federal University of Alagoas (UFAL), in partnership with Professor Richard Preziosi from Manchester Metropolitan University, the proposal “Empowering traditional communities in the Brazilian coastal zone to adapt to the climate crisis” aims at creating projects that can be replicated anywhere in the world. According to Bárbara Pinheiros, project coordinator at UFAL’s 21st Century Conservation Laboratory (**Lacos21**), in the initial phase, the workshop wants to encourage the realisation of projects with equal but diverse teams, bringing together biologists, artists, and professionals from different fields of knowledge who will interact, learn from each other, and explore opportunities to build lasting research collaborations in the field of climate change.

The professor has already carried out another project with funds from the Newton Fund via the **British Council**: the “Developing Investment Blueprints for Sustainable Use Protected Areas in Alagoas State”, which encouraged partnerships in the areas of Rural Development and Biodiversity.



Credit: Bárbara Pinheiros

“In addition to the initial themes proposed in the call, our idea was to work with Sustainable Development Goal 5, which aims at Gender Equality”, explains Bárbara. According to her, each group must develop a product, such as an online course or an application, depending on the profile of each team, considering the specificities of traditional communities. Held on 27th and 28th May, and 3rd June 2021, the workshop had the support of mentors such as Ana Nuno, researcher and honorary professor at the University of Exeter; Johan Oldekop, professor at the University of Manchester; Fabiana Couto, Superintendent of Environment at the State Secretariat for the Environment and Water Resources of Alagoas (SEMARH) and Professor Jessé Marques, from Centro Universitário Cesmac.

//“We are 9 billion people in the world, we have to consider people in the conservation of the environment.”

They helped to develop Research-Intervention Action Plans in one of the following categories: 1. Ocean Science, 2. Citizen Science, 3. Scientific Communication or 4. Gender Equality.

Proposals in each category compete for a prize of up to £8,750 for teams to carry out their projects, plus the opportunity to share research knowledge and network internationally. One of the concerns of the organisers is precisely the construction of links for future collaborations and long-term actions.

Lacos21 works on multidisciplinary fronts that consider human interactions with the environment. Participation in the call of the Researcher Links Challenge Grants – Climate Change was a chance to expand the actions already developed in the laboratory: “If we leave people out of conserva-

tion actions, we will not proceed the way we need to, at the speed required to advance in environmental agendas” defends Professor Ana Cláudia, and adds: “We are 9 billion people in the world, we have to consider people in the conservation of the environment”.

Sustainable meals for children

Nelzair Vianna from Fiocruz Bahia, and Ximena Schmidt Rivera from Brunel University, are responsible for the workshop “A sustainable and healthy food environment for children: the potential of school meals”. The proposal arose from work carried out and supervised by Nelzair, a researcher in Public Health, with studies on air pollution, planetary health, and climate impacts. A research under her guidance studies the intestinal microbiota in different food contexts (healthy food, plant-based food and conventional food) in the countryside of Bahia state, Brazil. The project is part of the Sustainable School Programme, led by public prosecutor, Leticia Baird. “Our proposal with the workshop is to encourage young researchers to bring alternatives for a healthier and more sustainable diet at schools”, highlights Nelzair.

Indeed, a worrying fact in relation to food production is the direct impact it has on climate change. Food choices cause very different amounts of greenhouse gas emissions, and diets provide a powerful lever for change. The school environment can, therefore, shape children’s behaviour and influence food choices. Working with schools has the power to reach a wide population with the possibility of implementing long-term behavioural changes.

Nelzair Viana is a representative of the International Air Quality Network, C40 Women for Climate, covering 96 cities around the world and led by Paris’s mayor, Anne Hidalgo. Nelzair is climate leader and graduated from the project The Climate Reality, idealised by US former-vice-president and environmentalist, Al Gore. She is also co-founder of the Energy and Climate Forum, a non-governmental organisation that brings together nine Portuguese-speaking coun-

tries to discuss issues related to the impact of climate change. Her research actions in dialogue with the development of public policies are aligned with a personal perspective of rescuing and fighting for gender equality. “Despite studying as much as men and taking courses and research on climate change, women are still deprived of leadership positions. But there are movements that strengthen great women in the world, and we see the results of these actions even during the pandemic, which was better managed in countries led by women, with sustainable recovery planning programmes”, she highlights.

For Chilean Ximena Schmidt, who joined Brunel University in London as Global Challenges Research Fellow in 2019, one of her research’s main objectives and actions to be developed from the workshop is to raise awareness about climate change and develop ways for consumers to make better decisions, with an understanding of the climate impacts of our food consumption. “Not only to better understand this cycle, but to provide an environment to co-create and co-design interventions that target solutions to the problem.” Among the examples of possible interventions, she cites the creation of educational materials or campaigns, training of school lunch providers, actions that connect menus to local cultivation, among others.

As a lifecycle sustainability specialist, Ximena is currently honing her system modelling skills to broaden her scope of studies in areas such as healthy, sustainable and affordable diets, sustainable food supply chains and technologies, circular economy and waste management. One of its goals is to strengthen research and teaching collaborations as well as professional networks in the area of sustainable energy and food systems across the Global South. “If we don’t work together co-creating solutions, they won’t exist. It is a challenge to align the different realities of action in the UK, or in Latin Ameri-

ca, but all voices are important in the process. Therefore, we must make this process collaborative, inclusive, and open, but in a way that we can really develop it”, she highlights.

The Sustainable School Feeding workshop proposal gathers researchers from different areas, such as nutrition, data science, education, purchasing, behavioural change and food climate change, and also brings together public policy makers such as government officials and school administrators. Prizes of up to £7,000 will be available for the workshop’s best eligible projects.

//“But there are movements that strengthen great women in the world, and we see the results of these actions even during the pandemic, which was better managed in countries led by women, with sustainable recovery planning programmes.”

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Technologies are not neutral, they reinforce stereotypes of the offline world and influence historical processes of racism and social exclusion.

</>

Hacking the system

Tuany Alves

Illustration: Andressa Meissner

Acts of racial and sexist-based discrimination are more evident in speech or gestures of human relationships. In recent years, racism and sexism have been increasingly discussed in the digital sphere, creating a new scenario in which aggression is seen in coding lines. Data scientists and information technology professionals, mainly women, have been warning about this algorithmic bias for some time.

According to Silvana Bahia, Founder of *PretaLab* -, project that creates actions to integrate black women into technology spaces - to understand this scenario, it is first necessary to understand what an algorithm is. Known for being coded procedures that, based on specific calculations, transform data into information, algorithms are commands that machines receive to perform actions.

“We watch a fictional film on a streaming platform after which we are referred to another film in the same genre. These are the algorithms performing an action based on a **database** query, with possible information and probabilities already determined to perform an action”, explains Silvana, using content recommendation algorithms as an example. However, according to her, current technology uses data from an oppressive past to project the future.

The founder of *PretaLab* reminds us that technology is part of our daily lives, as seen so clearly during the Coronavirus pandemic, and brings situations of exclusion such as algorithmic racism, or **structural racism** present in society and transposed to the universe of machines. One example is facial recognition, through artificial intelligence (AI). The technology, which is already used in cities like São Paulo and London to solve crimes, is still not safe enough. Data from the Security Observatory Network indicate that more than 90% of arrests for AI are of black people.

Online space where collected data is archived and prepared for the algorithm.



Silvana Bahia,
creator of the
PretaLab

//“Current technology uses data from an oppressive past to project the future.”

For Silvana Bahia, the use of facial recognition by public security represents a problem. “We embedded information in a database about the profile and stereotype of a criminal. We know very well what these characteristics are supposed to be, and this has to do with racism”, she highlights.

It is the naturalisation of actions, habits, situations, socioeconomic conditions, speeches and thoughts that are part of the daily life of Brazilians, and that directly or indirectly promote racial prejudice.

Another emblematic example is self-driven cars that began testing in 2019, and which have a 5% more chance of running over black people. These situations make many people question the errors of their codes, when in fact the problem is in the background of the programmers, since there is a great homogeneity in the areas of innovation and technology. “In general, it is a standard type of people who do not take all the necessary tests, because they do not understand that there is a great plurality of people in the world”, says Silvana Bahia.

When discussing and developing technologies, people do not take into account the social issues behind them, depriving them of responsibility, and believing in the promise of algorithmic objectivity. However, the examples make clear that the technologies are not neutral and carry the worldview of those who created them. According to Diana Daste, Acting Regional Lead for Higher Education & Science – Americas, AI is one of the technologies that brings many vices within the operating systems. “For this reason, we also have to penetrate these networks, to bring diversity to the production and programming of these systems and prevent them from ending up reproducing or repeating biases and exclusion formats in a digital context”, she points out.

According to Adriana Barbosa, creator of [Feira Preta](#), we have a complex society, built by racial and gender inequality, based on Colonial Brazil. A complexity that is precisely brought to light by diversity and becoming increasingly necessary in technology markets. It is necessary to count on the participation of those people who are discriminated against. “If you don’t live, don’t feel, don’t know, you won’t be able to offer more assertive solutions to the market, with the specificities that the Brazilian population has”, she points out.

Largest black culture festival in Latin America supported by the [British Council](#). It takes place annually since 2002 and aims to foster the production chain of black Brazilian entrepreneurs.

Global problem

According to the survey #QuemCodaBr, by *PretaLab*, men represent around 68% of technology professionals, while women do not reach 32%. Furthermore, in 32.5% of the cases there are no black people on the teams of Brazilian technology companies. The ‘Cracking the code survey: Girls and women’s education in science, technology, engineering and mathematics’, released in 2017 by UN Women, shows that 74% of women are interested in science, technology, engineering and mathematics. However, only 30% of them become researchers in these areas. For those who entered the job market, 27% feel that they are not progressing in their careers, while 32% give up within a year of graduating.

For Marième Jamme, this is not a continental problem, but a global one. The Senegalese, whose goal is to teach programming to 1 million women by 2030, pointed out, during the Black Technologies panel of

the online event *Feira Preta*, that girls living in the slums of Jaçanã, Heliópolis (Brazil), have the same problems as those who live in Kibera, in Nairobi (Kenya). “That’s why we need to collaborate and work together. Instead of making double the effort, we can use the same methodology, since it is a systemic problem”, she points out.

Building diversity

Despite all the barriers, there are initiatives such as the Algorithmic Justice League, founded by Joy Buolamwini, which seeks to denounce and end implicit racism in artificial intelligence programmes. Silvana Bahia goes further and believes that there are anti-racist technologies, created by black people and designed not to reproduce racism. She cites teams like *Ho Tecnologia*, formerly *Afro Tecnologia*, which develops equipment and audio-visual material, in addition to DataLab, which works with data from the perspective of vulnerable areas. “I believe that there are very relevant actions in these fields, that we need to look more closely and understand how we contribute so that they continue to exist and have an impact”, she points out.

For entrepreneur Adriana Barbosa, when talking about digital transformation with diversity, it is also necessary to consider infrastructure, access to education, equipment, and internet. The entrepreneur recalls that there are several contexts and that if we do not take the racial intersection into account, part of the population is left behind. “We did a project called **Casa Preta Hub**, a space for digital transformation, and it took us almost two months to get internet. Since there was no optical fibre connection, it was necessary to go underground to get it and, for that, we would need approval from the municipality. In other words, quality internet is not for everyone”, she says.

Marième Jamme emphasises that, to overcome this entire scenario, it is also important to have a more proactive attitude from the community of black women. For the creator of the *IamtheCode* project, women need to be smart, especially in the field of technology, to learn important skills to build diversity. “I don’t expect white communities, millionaires or billionaires, to build for me. I build. We need to start building, creating solutions. Dealing with companies is good, being a technology activist too, but we need to sit down and build. Because we need to be the next Mark Zuckerberg.” The Senegalese also says that Jay-Z, Beyonce, Kanye West and Oprah understand the importance of building, so they are creating solutions for the future and are close to Bill Gates.

Physical space of the Preta Hub digital platform, where it is possible to create, produce and distribute products and services for people with black aesthetics.



//“Racism and sexism are present in all areas of our lives because they are structural and structurers in our country.”

STEM: AN AREA FOR WOMEN

The challenges for women arise from childhood: when girls are given dolls and boys are given tools to assemble and disassemble. According to Silvana Bahia, we are raised in a culture that defines which spaces women should occupy. “When we go to university or the job market, sexism is accentuated. And when we talk about black women, male chauvinism and racism are barriers that end up causing them to always have their knowledge questioned or to remain within a stereotype of what it is to be a woman”, she says.

For Silvana, these problems are reinforced in the scope of STEM – an acronym in English for Science, Technology, Engineering and Mathematics –, strategic areas of scientific development for society. According to Silvana, these are spaces of power that even dictate politics and the economy. Therefore, black people, especially women, are removed from this place. “Racism and sexism are present in all areas of our lives because they are structural and structurers in our country. This has to do, for example, with you spending your entire academic life and never having had a black teacher, not reading bibliographies of, or meeting black scientists. This is also a form of racism and one that is reinforced in the world of STEM areas”, she explains.

It is, therefore, a challenge for women to be in these spaces, as they were not designed to receive them. “When we decided to go further and not accept these socially imposed conditions, we ended up feeling very alone. Therefore, it is essential to work so that other women can also access these spaces, that they can build technologies and feel welcomed”, Silvana points out. With this mentality change, it is possible to solve two problems: the lack of diversity in the production of technologies and the lack of opportunities for black women in formal employment.

For Silvana, the first step is to recognise the problem, to assume that racism exists and is embedded in all structures and spheres of society. The second point is to learn to listen and create different solutions to mitigate its effects. “However, the most important thing is to recognise that this is an issue, so that we get angry and try to change”, she emphasises.



The future belongs to all girls and women

Mariana Alencar

Illustration: Andressa Meissner

In different regions of Brazil, projects encourage the participation of girls in science and celebrate the diversity of cultures and gender equity.

“Even after we have earned the right to education, there is a belief that some areas are not for us. Even with school, which theoretically is for everyone, opportunities for women always require greater challenges. So why then do one project for girls? Because we need to solve these problems that distance us from our rights.” The speech by Renatha Cruz, leader of the *Garotas Cientistas* project at the Federal Institute of Goiás (IFG) - Uruaçu campus, exposes a reality faced by girls across the country, especially those who, in addition to gender-related problems, face difficulties associated with socioeconomic and racial vulnerabilities.

Renatha’s own life experiences show barriers of historical origin reflected to this day in different regions of Brazil. “I am a black woman, from a vulnerable neighbourhood, and no one guessed I would have the position I do today, a teacher at a federal educational institution. I have therefore made a public commitment that all my research, work and projects would be to meet realities like mine”, comments the professor and geographer.

//“The cool thing about the project is that we encourage girls to be leaders of their own actions. So, we invited the students here on campus to make up the team, not only to be part of, but to be the team. They are girls training girls.”

Garotas Cientistas also gave rise to publications, a documentary and participation in events. The material can be seen at bit.ly/meninascientistas.



Upon taking office at IFG, Renatha started a research project on autonomy and empowerment. This study gave rise to *Garotas Cientistas*, which seeks to guarantee access to education for *quilombola* girls with disabilities, in social vulnerability or who live in rural areas. Through workshops in the areas of engineering, geoprocessing, chemistry, robotics, virology and literature, more than 200 girls from schools in Uruaçu and Cavalcante in Goiás state are encouraged to get to know and integrate the world of STEM.

“The cool thing about the project is that we encourage girls to be leaders of their own actions. So, we invited the students here on campus to make up the team, not only to be part of, but to be the team. They are girls training girls”, comments Renatha.

Since its creation in 2018, *Garotas Cientistas* has yielded valuable results. According to Renatha, the students’ report reveals that the project gave them conditions and courage to take a stand. “Many of them were quiet. Today they get together and are part of student representation movements. As some of these girls live in situations of extreme vulnerability, this opportunity motivated them, because they are students with enormous potential”, celebrates the geographer.

The project *Garotas Cientistas* was one of the 12 projects selected by the public call “Garotas STEM: formando futuras cientistas”, the result of a partnership between the **British Council**, King’s College London and the Museum of Tomorrow (SEE BOX). The initiative provides financial and technical support for projects that aim at encouraging and expanding the participation of girls in the fields of hard and natural sciences, engineering and computing, and are aimed at elementary and high school students.

“The public call is in the interest of broadly benefiting the ecosystem of Brazilian science, operating in the five regions of the country and encouraging the connection between schools, museums, universities and other organisations where there are projects that encourage children, teenagers and young people to pursue careers in STEM areas. For this reason, in addition to the eligibility criteria part of public calls, *Garotas STEM* considered regional diversity, the connections established between areas of knowledge and between actors and institutions in the various spheres of Brazilian education, valuing the role of women in leadership selected projects”, explains Maria Garibaldi, Director of Public Development and Partnerships at the Museum of Tomorrow.

According to Maria Garibaldi, the financial support is made through the transfer of resourc-

es of amounts between R\$7,000 and R\$12,500, which must be used exclusively for carrying out the projects. In addition to this contribution, those selected received training in science and gender teaching. The activities were given by the STEM Education Hub, a partnership between King's College London and the **British Council**, which aims at cooperation between Brazil and the United Kingdom in the fronts of research, training, and innovation to encourage the teaching, learning and dissemination of science, aimed at promoting quality education for all.

Community appreciation

At a distance of more than 1,500 kilometres from Uruaçu, the municipality of Igarapé-Miri in Pará state also has a project to encourage the participation of girls in STEM. Coordinated by biologist Adriane Gonçalves, “Girls in Science: Developing the Leadership and Engagement of Riverside Women” emerged in 2019 with the aim of increasing female participation in the Igarapé-Miri Science, Innovation and Technology Fair (FEICITI).

“At first, our idea was to get more girls to participate in the fair with projects in STEM areas. But later we began to understand that this reinforced the important role of these girls in the scientific development of the Amazon region, especially in our riverside communities, where they live,” Adriane emphasises.

The initiative, therefore, also began to aim at creating study groups and promoting visits and excursions to technology spaces in the capital, Belém. From a cycle of workshops in riverside communities and actions with the *Saberes da Terra* programme of Pará's State Secre-

tariat, the initiative made it possible for girls and women to start their journey as researchers.

The girls developed projects related to the environment, as well as the production of school gardens reusing materials. They also participated in educational robotics, math with game production, and basic engineering workshops for early graders. “Our expectation is that the groups of girls assisted in three schools in the rural area will build, at the end of the project year, technology that will respond to a local problem in their community”, explains Adriane.

Adriane's experiences and her relationship with the community are important elements that drove the project's creation. “As I'm from the countryside where my parents still live today, I always say: we need to train people in different areas so that we can return and help our community grow. We suffer from the impact of deforestation, predatory fishing and river pollution. On the other hand, we have a rich biodiversity of fauna and flora. So, we need professionals who can return to the community and help. The project also follows this perspective,” she says.

//“As I'm from the countryside where my parents still live today, I always say: we need to train people in different areas so that we can return and help our community grow.”

The project was named in honour of Akotirene, one of the first women who lived in Quilombo dos Palmares and who had a great influence on the life of the *quilombolas*.

Cooperation and science

The enhancement of local culture through science is also present in the scope of actions promoted by the **Akotirene Kilombo Science** project, in the Mãe Preta Territory - Kilombola Morada da Paz Community (CoMPaz), in the municipality of Triunfo (RS). The community is mostly made up of women who protect the cultural heritage of their people. CoMPaz was recognised by Fundação Cultural Palmares in 2016, but for nearly 20 years it has been seeking to recover African and Afro-Brazilian ancestral wisdom by valuing the sharing of knowledge.

In this context, the Akotirene Kilombo Science emerged four years ago, an education project aimed at young people in the community who, in interaction with students from schools in the region, learn about sky and earth from a multidisciplinary perspective. “The project is focused on promoting the reduction of inequality, gender equality, quality education and interculturality, with the union of schools, *quilombos* and universities. We seek racial equity in basic education, enabling the interest of black *Quilombola* girls in STEM careers,” details Ômò Ayó Otunjà Yamoro, project leader.

Akotirene Kilombo Science takes place in partnership with two schools in the region: the Liberato Salzano School, which serves young people from within and outside the *quilombola* communities, and the Comkola Kilombola Epè Layiê School, responsible for educating children at CoMPaz. For Yamoro, bringing students from inside and outside the community together is an invaluable point in the project’s development. “This integration is what provides the beauty of the alliance, the dialogue, and the meeting. Akotirene also works on collaboration, solidarity and dreaming”, she comments.

Altogether, more than 50 girls, aged 15 to 18, have participated in the project. After participating in astronomy, biology and chemistry workshops, and in conversation circles on women’s participation in science, the young women became multipliers and were able to broaden the discussions on gender inequality in STEM areas. Now, the project is moving towards increasing the scope of disciplines. “Our focus is to work in three strands: artificial intelligence and computational thinking; environmental education in interface with science; and the debate on ethnic, racial and gender relations within STEM areas”, concludes the project leader.



Credit: personal collection

Ômò Ayó Otunjà Yamoro

//“The project is focused on promoting the reduction of inequality, gender equality, quality education and interculturality, with the union of schools, quilombos and universities.”



Girls STEM: future scientists

Find out more about the projects selected in the call promoted by the **British Council**, King's College London and the Museum of Tomorrow.

Meninas cientistas: educação, protagonismo e enfrentamento às violências de gênero

(Renatha Cândida da Cruz; Federal Institute of Goiás-Câmpus Uruaçu)

Meninas na ciência: desenvolvendo o protagonismo e o engajamento das mulheres ribeirinhas (Adriane da Costa Gonçalves; Igarapé-Miri University Centre; Açai Training Centre)

Akotirene Kilombo Ciência (Claudia Rocha David; Mãe Preta Territory - Kilombola Morada da Paz Community)

Cunhantaí: meninas na ciência e tecnologia (Cecília Maria Pinto do Nascimento; State University of Mato Grosso do Sul)

A PRÓ-MAR vai à escola (Karina Vieira Martins; PRÓ-MAR Environmental Partner Organisation)

Meninas na ciência da computação: despertando vocações através do conhecimento (Josilene Aires Moreira; Federal University of Paraíba)

Sarminina cientistas: estimulando meninas do Maranhão para as carreiras de exatas e tecnologia (Kátia Simone Teixeira da Silva de La Salles; Federal University of Maranhão)

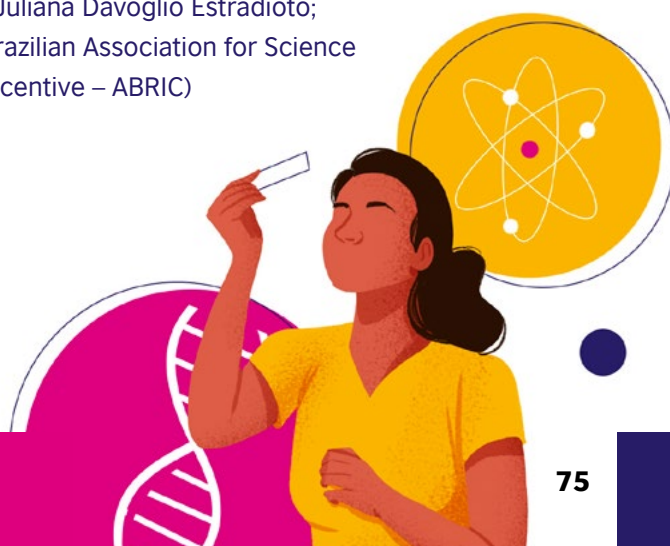
Meninas na computação (Patrícia Araújo de Oliveira; Federal University of Amapá)

STEAMS: ciência, tecnologia, engenharia, arte, matemática e sustentabilidade, mecanismos para maior inserção de meninas da rede pública na universidade e integração com alunas da UFPA (Ana Paula Mattos; Federal University of Pará)

Peritech: arte, tecnologia, inovação e robótica na Maré (Ana Carolina das Neves Silva da Hora; Maré Development Networks)

30 dias de ciência (Juliana Davoglio Estradioto; Brazilian Association for Science Incentive – ABRIC)

Manna Academy: uma rede de estímulo à participação e à formação de meninas e mulheres para as carreiras de engenharias, computação e microeletrônica (Juliana Davoglio Estradioto; Brazilian Association for Science Incentive – ABRIC)



Gender Summit, 10 years: legacies and challenges



Luiza Lages

Illustration: Andressa Meissner

A world reference in the debate on gender equity in science, Elizabeth Pollitzer talks about the journey of the Gender Summit and the future of the events platform.

In 2001, scientists at Imperial College London created Portia, a non-profit organisation that aims to promote an understanding of gender issues in the sciences. One of the group's first steps was to develop a seminar project for the European Commission, revealing that scientific production was collecting more evidence for men, favouring them over women. From the need to make such information public and to broaden the debate on the evidence produced, the Gender Summit was born. In 2021, the platform of events celebrates 10 years: in different parts of the world, scientists and policymakers meet to examine evidence on how sex and gender impact research results, identify improvements and who should act to promote them. In the following interview, Elizabeth Pollitzer, co-founder and director of Portia, talks about the evolution of the debate around gender equity and diversity in science over these years, and presents expected challenges for the future of the Gender Summit.

Women in Science Magazine: Looking back, what has changed between the first and last editions of the Gender Summit? How has the debate on gender equity in science evolved?

Elizabeth Pollitzer: A lot has changed. But there are certain aspects that persist, like women in leadership positions: they are still in the minority. Of course, a lot of knowledge was produced to try to understand what is happening throughout the career that leads to this under-representation. It's almost clear what it is. It has to do with different family responsibilities and women's time being taken out of the research, because someone has to take care of the family and it's usually the woman's job. And if they don't have as much time for research as men, they can't publish as many articles as they would. There is now enough evidence that says all of this, but it is still very difficult for many people to admit it. The most relevant thing that happened around the time of Gender Summit 21 was the COVID-19 pandemic. The pandemic has shed light on all inequalities and magnified them. We saw women researchers having to stay at home and educate their children; editors reporting that researchers are submitting fewer articles because they obviously don't have the time. The pandemic also serves as an important example for talking about gender in several respects: because the effects on men's and women's health are different, and because more women are involved in healthcare, so they were more directly impacted. The other thing that has changed over these 10 years is that there is a lot of interest now in connecting gender equity with diversity, inclusion and intersectionality. People are trying to understand what

the different concepts mean and how they relate. At Gender Summit 21, we're trying to get the scientist to stop and think about this: gender differences or diversity are not just about sexuality. From a scientific point of view, we have to study these concepts, intersectionality has to be a theory, there has to be models. What was really interesting about this tenth anniversary was the great participation from the scientific leadership. Before, we would have had to explain to leaders the importance of being at the event and thinking about gender issues in science, research and innovation, but we didn't have this problem with the last Gender Summit. It took 10 years to consolidate the idea that this is all about excellence and relevance of research to society, so we have definitely made progress in this aspect. Perhaps people are also realising that there is a shortage of talent, populations are not growing, and there are more women finishing university than men. Therefore, there are more highly educated women than men. They really need to take this underutilised talent pool of women more seriously.

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W.S.M.: Over these last 10 years, how has the Gender Summit promoted effective changes in the scientific community and society, in relation to gender and diversity?

E.P.: It's all about bringing in scientists, analysing evidence, saying where there are problems and how to make improvements, and then pointing out who should act. This has always been the focus of every edition of the Gender Summit. It's not a scientific conference, it's a congress that takes great care with organising the programme, making sure that each session has a panel of researchers who can create synergy on the topic, give recommendations and who really feel that they are contributing to it. We are therefore targeting the scientific community and policymakers and then all stakeholders who depend on the quality of scientific knowledge. But the main thing is the evidence, because, fortunately, there is a lot of it to show the benefits of applying a gender lens to research, in addition to the positive consequences for innovation, for markets. But we have to interpret this evidence so that policymakers, scientific leadership and science editors can understand what they can do. Only then do we present it, so that everyone who has some kind of agenda that can incorporate that evidence turns it into action. We can show that if universities, research funders and industry are employers of researchers, they actually have a lot of interconnections, because basically they all need very good knowledge and very high-quality talent. So, it's in your interest to see how women fit into this, how gender dimensions fit, how discoveries of differences can be translated into better outcomes. That's what people think is really attractive, and it's not hard for them to respond.

//“We still have a lot to learn from COVID-19 on how to deal with these terrible interruptions. These are not just epidemiological models, but all socioeconomic, mental health, education and inequality issues.”

W.S.M.: For the next 10 years, what are the main challenges for the Gender Summit and for the debate on gender equity and diversity in science?

E.P.: In the next 10 years we will really have to focus on sustainable development. There are 17 UN Sustainable Development Goals (SDGs) and, for about a dozen of them, there is very little research being done with a gender lens. So, women will undoubtedly be left behind. It seems that researchers dealing with sustainability don't really understand why they should think about sex and gender differences, even though it's one of the SDGs. This is a big challenge: how to persuade this large sustainability research community. Another challenge sits in the emerging areas of science, such as nanotechnology and nanomaterials. Much of this research is motivated by biological applications, such as in agriculture or the environment, or applications for monitoring physiological processes, and you will hardly find an article that really looks at sex and gender differences – and the physiology of women and men. They are very different. Another challenge is the circular economy: how do women get into it? In economic development measures, it is assumed that women will benefit. Let's say you bring electricity to a village. Naturally, will women benefit from it? This is not true unless researchers really look at them. If in one of the houses in this village five light bulbs can be installed, the kitchen will not necessarily have one, or even if the household can buy a washing machine, this is not what will be prioritised. Men's preferences prevail over how electricity will be used. These are basic things. In new fields of employment and innovation, such as the circular economy, women need to be brought in. And we still have a lot to learn from COVID-19 on how to deal with these terrible interruptions. These are not just epidemiological models, but all socioeconomic, mental health, education and inequality issues. We still have big challenges for the future, and new ones will appear, but now we have a good network of people who think all of this is very important – which is an important step on this path.

bit.ly/revista1WiS

bit.ly/revista2WiS



Black leadership in technology

Historically, the science, technology and innovation areas have always been mostly male and white. Hence the importance of bringing intersectionality to the debate as a way of transforming identity experiences crossed by gender, race and class oppression. For researcher Carla Akotirene, intersectionality promotes political interventions and legal literacy on which structural conditions such as racism, sexism and related violence overlap and discriminate against **black women**. The reality of exclusion in technology spaces has motivated women to lead projects to promote connection and serve as a starting point for changing the dominant scenario in the area. Silvana Bahia, creator *PretaLab*, is one of the examples. (Issue 2, pg. 40)

Memory

Remembering the previous issues of
the **Women in Science Magazine**.

Afrofuturism

Afrofuturism brings a mix between African ancestry and current technologies, as well as the creation of narratives that give visibility to black prominence. The movement gained emphasis in the American context in different genres: cinematographic, with the blockbuster *Black Panther*; musical, from musician and composer Sun Ra; literary, with science fiction writer Octavia E. Butler, and Mark Dery, author of the essay *Black to the future*. The multi-artist and researcher Zaika dos Santos turned Afrofuturism into an academic research objective and scientific dissemination project. She created a website with video, podcast and photography content to contextualise the past, present and future connected by African and Afro-descendant art, science, technology and innovation from the perspective of **black women**. (Issue 1, p. 62).

Social belonging

How do you imagine a scientist? This question was asked to boys and girls, who let their thoughts fly: “A scientist is someone who discovers interesting things”, replied Ana Vitória, 10 years old. Ana Clara, 9 years old, already imagined a female scientist, with black skin, black hair and blue clothes. José, 8 years old, thought of a male scientist with spiked hair and white clothes. Studies show that the construction of **gender** stereotypes is one of the reasons for the disproportion between men and women in STEM areas, especially in leadership positions in research. A study carried out in Sweden with 1327 students, published in the Sex Roles magazine, showed that the sense of **social belonging** guided the choice of more men for careers in STEM and more women for health, basic education, and domestic areas, even in a country with greater gender equity. (Issue 1, p. 31)

Collaboration that generates diversity

Citizen science projects include ordinary people in research and reduce distances between academia and society. For a long time, the idea that science and society should not mix contributed to the construction of the imaginary that the scientific enterprise was restricted to a few. However, the concept of citizen science emerges as a movement and a way of doing research that intends to reduce this distance, bringing people closer to **scientific production**. Collaboration between communities and universities results in diversity and contributes to the notion of **social belonging**. “Citizen science generates democratisation of science and empowers those who participate. It develops critical thinking and builds scientific citizenship. The more plural the science, the better the results”, says Blandina Viana, biologist, agronomist, PhD in Ecology and professor at the Federal University of Bahia (UFBA). (Issue 2, p. 56)

Invisible women

Behind the scenes of science, the work of the laboratory technician is fundamental to the understanding that knowledge production is collective. However, they often end up going unnoticed in **scientific production** at universities and research institutions. In 1991, the historian and sociologist of science, Steven Shapin published a study that reported the invisible processes of laboratory technicians, in the magazine *American Scientist*. According to the author, this process is manifested by the lack of reference to technicians, commonly considered secondary or peripheral elements in the development of research, even though they are responsible for carrying out important steps.

(Issue 2, p. 68)

Men standing with Women in the struggle for gender equality

The search for equality between men and women involves reflection and redefinition of concepts about the role of both in society. “It is difficult to bring men into the discussion of **gender** equality because they are afraid of losing their masculinity and power,” says psychologist Daniel Lima. The fight for gender equality should not just be for women – men also need to be involved. For these advances to occur, however, it is important to start by making men aware of the importance of their participation in the construction of a more equitable society - a process that necessarily involves the redefinition of what masculinity is.

(Issue 1, p. 34)

ERRATUM

The project *Menina Ciência, Ciência Menina*, cited on page 62 of the article “Once upon a time... a scientist!”, from the 2nd edition of the *Women in Science* magazine, was conceived and is coordinated by Professor Maria Inês Ribas Rodrigues, professor and researcher in Physics Education at the Federal University of ABC (UFABC).



Women in Tech: **INCLUSIVE LEADERSHIPS**

**How do you
recognise a good
leader? How about
developing new skills?**

The **British Council** has created a new training for women who wish to develop their interpersonal skills and advance in their careers, as researchers and/or entrepreneurs, especially from underrepresented groups such as black, indigenous, LGBTQ+ and people with disabilities.

The training is offered to institutions who wish to enhance women's interpersonal skills in order to increase diversity in leadership positions. The training can be tailored to the institution's goals and replicated to different contexts.

The on-line activities are offered in 13 modules under various themes, such as self-knowledge, leadership, diversity, digital presence, networking and partnerships, conflict transformation, entrepreneurial mindset, access and support to capitals, digital transformation, mental well-being, replication and mentorship, and building the future.

For more information about the
training and more initiatives, please access:
www.britishcouncil.org.br/mulheres-na-ciencia