

# Cunhantã Digital: Contributing to Gender Equality in Technology in the Brazilian State of Amazonas

Fabiola Nakamura  
fabiola@icomp.ufam.edu.br  
Federal University of Amazonas

Adriely Lavareda  
adriellyslavareda@gmail.com  
Federal University of Amazonas

Alice Lucena  
alice.lucena@icomp.ufam.edu.br  
Federal University of Amazonas

Ana Kiara Braga  
akmb@icomp.ufam.edu.br  
Federal University of Amazonas

Bruna Souza  
bruna.mariana@icomp.ufam.edu.br  
Federal University of Amazonas

Gabriela Rebelo  
gabi.cristiny@gmail.com  
Federal University of Amazonas

Isabelly Oliveira  
irbo@icomp.ufam.edu.br  
Federal University of Amazonas

Tedy Prist de Souza  
tedy.prist@icomp.ufam.edu.br  
Federal University of Amazonas

Ketlen Teles  
ketlen.teles@gmail.com  
Federal University of Amazonas

Tanara Lauschner  
tanara@icomp.ufam.edu.br  
Federal University of Amazonas

## 1 INTRODUCTION

The Cunhantã Digital Project started in 2015 with professors from the Institute of Computing at Federal University of Amazonas (UFAM), Fabiola Nakamura, Tanara Lauschner, Rosiane de Freitas, and Tayana Conte. The project is a sister project of the Digital Girls Program of the Brazilian Computer Society (SBC). Cunhantã digital supports and embraces the Digital Girls Program's mission to awaken girls' interest in pursuing a career in Information and Communication Technology. However, using the term Cunhantã, which means girls in the Tupi-Guarani indigenous language, reinforces the regional aspect of the project and brings visibility to the region [2].

The Amazon state is the largest in Brazil in terms of extension, has more than 90% of its native rainforest preserved, and has its own culture and the potential to combine Technology with its vocations such as plant extractivism, natural gas, fishing, and tourism. However, most of the population lives in the capital, and we have several countryside cities in high social and economic vulnerability. We believe that increasing girls' interest in Technology could open excellent opportunities for them and even create a labor market that can advocate in favor of gender equity and deal with sustainable development and social vulnerability in the State.

The mission of Cunhantã Digital is to awaken, in elementary and high school students, the interest in Computing and to motivate girls who identify with the area to seek the necessary training for a successful career in a market in expansion in the State of Amazon. In this sense, we seek ways to present the area to young girls, to demystify the concept that STEM is a male area, incentivizing the discussion about gender and creating a safe space for girls. We believe technology can transform society if it embraces diversity, inclusion, and representativeness in its development group [4].

We also aim to create a support network for these girls, stimulating people around them, such as family, friends, and the school environment, such as their Teachers, educators, and male colleagues, to back their choices and aspirations.

## 2 INITIATIVES

To achieve our goal, we worked on workshops, production of didactic material, lectures, participation in fairs, social media and production of artistic-scientific material.

Our workshops have lectures, practical activities, and panels to discuss various issues related to gender equality in the IT field. We also run specific workshops like logical thinking, computing, and Scratch programming to reach younger girls with a more hands-on aspect. In this sense, we have also created didactic materials for teachers and educators[4].

Our presence at fairs divulges our work and brings light to a relevant and sometimes neglected subject: the need for diverse teams at the cutting edge of technological development and applications. During a talk given by Cunhanta Digital at a Students State Fair, a freshman in Computer Science at UFAM was sure that it was the area he wanted. "I left there with the certainty of what I wanted to study," he says. For her, projects like this during her university life give her the security of having a safe space to seek mentoring and professional advice.

Since 2018, we have applied a dynamic involving a Caesar Cipher in the first week of classes to integrate the first-year students of undergraduate computing courses. During the dynamic, we formed groups with only one girl, and where the other participants were men and assigned leadership roles to the girls without defining the roles explicitly. In some groups, a leadership posture continued, with the girls continuing to lead the process or at least being very participatory, integrated, and decisive in solving the puzzles. However, in most cases, the girls remained withdrawn and intimidated, adopting only the role of registering (writing down) what was being deciphered by the rest of the group. However, without a doubt, the stimulus to the leadership role subtly determined in the beginning helped in some of the girls' self-reliance, confidence, and active participation [3].

In 2019, The Cunhantã Digital Project was nominated for the World Summit Award for the Information Society (WSIS) category

Capacity Building. The nomination brought greater visibility to the project and the possibility of reaching an even larger audience. An international and prestigious award nomination was also a significant recognition for all the activities we have carried out, mostly voluntarily[6].

In 2020 and 2021, we intensified our presence in social media. Our social media strategy is related to the project’s core values: inspiration, capability, acceptance, empathy, and equality. The posts vary in content, including biographies and contributions from scientists, essential terms for the area, the professional’s area of activity, events, and commemorative dates [1].

We noticed that it is essential to demystify the view that the area is male. We need to revisit the history of Science and show how women, despite cultural adversities, contributed significantly from the beginning. We have strong women scientists who must be given the distinction of merit and right. However, the basis for this engagement must be born in childhood. We need to dissolve stereotypes, like the ones that expect different behavior from boys and girls. We need to create in our girls the will to venture into different areas, get them out of the idea that they must be perfect, and teach them to deal with frustrations and changes in plans. STEM areas’ premises lie that error, imperfections, and incompleteness are part of our knowledge, and whenever we identify them, we advance our knowledge about the universe. STEAM is an adventure for girls and boys.

In this scenario, the project produced 12 short films (around 5 to 7 minutes) about Women Scientists, played by young girls from 8 to 13. The Project is Called "Smart Girls," and the dirt season was launched in October 2021. The films intend to celebrate and divulge women’s contributions to Science and show young girls that Science is possible. The young actresses play two characters, a scientist and a young girl. The main idea is to transform these women, once unreachable, into real and tangible examples. The short films are free, and activities related to each women’s contributions to Science are in the finalization phase and will be available to schools for free. Season 2 of Smart Girls is in pre-production[5].

One interesting fact are the number of girls, absolute and percentage, that enrollments one of our undergraduate courses from 20187-2020, as show on Table 1. Unfortunately the pandemic had a great impact on these numbers, but we are working to reverse the situation.

Course	2017	2018	2019	2020
Computer Science	13(24%)	12(21%)	12(21%)	14(25%)
Computer Engineering	4(7%)	5(9%)	12(20%)	10(18%)
Software Engineering	9(20%)	12(24%)	13(224%)	15(33%)

**Table 1: Table 1 - Female enrollments in Computing at UFAM.**

### 3 FINAL REMARKS

Our initiative was born within a university and as a support activity for women. Our great challenge was and still is to make ourselves heard without preconceived concepts. Many people use their own experiences to assess situations for specific groups. That is why we wanted to create a discussion space for people to listen to each other instead of just talking. Personally and professionally, we had

to break through many barriers and reassess many things to work on a project like Cunhantã Digital.

Our most important lesson is that engagement arises from continuous and regular actions. Girls suffer from Stereotype Threats without even notice. This situation made us aware that punctual activities are not enough to change their reality. They need constant positive reinforcement to consider pursuing a career in STEM.

Financial resources are a big challenge. Most of the work is done by University’s undergraduate Courses volunteers. Some activities need a full-time staff to make the results more effective. On the other hand, we also realized that society is interested in learning about activities of this type. So we must combine our activities with strategic planning, financial resources, and networking.

Our primary motivation is the certainty that science and technology are areas with enormous potential to generate benefits for society, as they have done for thousands of years. This potential will only be fully achieved if, at the base of the development and dissemination of science and technology, we have diversity, inclusion, and representativeness. Therefore, we need more women engaged in the generation of knowledge and the development of technology, as today, there needs to be more female representation in the area. We, as a society, need to understand that all areas need diversity and inclusion. Only in this way will we achieve broader representation, which is one of the steps toward a fairer society.

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