

Initiatives to minimize female dropout in areas STEAM at the Federal University of Amazonas

Ariel Nunes
arielnunes@super.ufam.edu.br
Federal University of Amazonas

Maria Vitória Nascimento
vitoria.nascimento@icomp.ufam.edu.br
Federal University of Amazonas

Natália Rufino
nataliarufino@super.ufam.edu.br
Federal University of Amazonas

Ruth Aguiar
ruthaguiar@super.ufam.edu.br
Federal University of Amazonas

Thailane Pereira
thailanepereira@super.ufam.edu.br
Federal University of Amazonas

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

Inês Padilha
in_math@ufam.edu.br
Federal University of Amazonas

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

1 INTRODUCTION

The Women in STEAM task at the Federal University of Amazonas (UFAM) encourages the academic community to build a more inclusive environment by designing actions that inspire women in technology courses to be active voices in their journeys. This activity is part of a larger project called SUPER. The SUPER (SAMSUNG-UFAM Project for Education and Research) project was born from a partnership between UFAM and Samsung Eletrônica da Amazônia in 2020. In addition to providing support to undergrad students, its main objective is to encourage research and technological development. The project includes eleven undergraduate courses at UFAM, namely Computer Science, Electrical Engineering (Telecommunications, Electronics, and Electrical Engineering), Industrial Engineering, Design, and Computer Science at the Manaus Campus, and Information Systems, Industrial Engineering, and Software Engineering at Itacoatiara Campus, in the interior of Amazonas[4].

Because STEAM - an acronym for Science, Technology, Engineering, Arts, and Math - is a predominantly male field, with two exceptions (Design and Production Engineering), the SUPER project focuses on the technical and socio-emotional aspects of capacitation. It aims to reduce the dropout of women in these courses. The Women in STEAM grantees and coordinators plan and carry out activities that consider the students' reality and needs based on scientific research, discussion circles, and students' testimonials. Among the actions developed include regular publications through newsletters and Instagram, interviews, discussion circles, and meetings to create healthy and safe spaces for gender discussions at the university and on the job market[1].

2 INITIATIVES DEVELOPED

There is a growing demand for studies that explore the presence of women in the areas of science and technology to understand the low representation of this group in these fields, even more so when the focus is on the state of Amazonas. When analyzing the professional scenario, according to data from the National Institute of Educational Studies and Research Anísio Teixeira (INEP), in Amazonas, in 2020, women represented about 33% of those enrolled in Engineering and Technology courses, while men represented about 67%. Women in the Exact and Earth Sciences courses represented

around 43% of those enrolled, while men represented approximately 57% [2].

When we think about the reality at UFAM, the female presence in science and technology courses follows this path. Collected data indicate that except for Design, Electrical Engineering - Electrotechnical, and Production Engineering courses, there is a significant difference in the percentage of female and male students completing STEAM courses. Another observed fact is that successful women in exact sciences do not receive the same recognition as men and are sometimes considered exceptions to the rule [3]. We know that women's participation has increased in many fields. However, the fight for gender and race equality is an ongoing journey[5].

To change the scenario, the Women in STEAM task seeks to create moments of discussion, provides an internal support network, and encourages diversity and inclusion, in addition to inspiring students with testimonials of great professors and researchers at the university, also bringing more visibility to these great professionals. We describe the activities of the task as follows.

- Conversation Circles promote open and inclusive dialogues, creating a space for sharing ideas, experiences, and opinions on topics relevant to the students. This activity usually takes place in partnership with other Tasks, especially psychology, with topics such as anxiety, routine and academic life, organization, and burnout syndrome, among others. The conversation circles are offered to the entire academic community and aim to raise public awareness of the relationship between the proposed themes and gender issues, so we seek to invite women who work in the area of the topic addressed, who are in the academic or professional environment.
- It's Friday is a monthly meeting to add experiences, welcome people, and encourage dialogue. It's Friday with Women in STEAM takes place on the last Friday of the month and is an exclusive event for women. It is a moment of relaxation and venting, a welcoming space to share frustrations and desires and have fun.
- The newsletters are produced twice a month and aim to share current and relevant information and present interviews and biographies of women in science and technology.

- Women Who Inspire Us Series is a set of videos and cards released on the project's social media, which seeks to give visibility to the university's professors. The female faculty are invited to share their experiences as professionals and researchers in the STEAM fields and offer inspiring words for students and women interested in pursuing a career in the area.
- Production of material for dissemination in the project's media allows reflection and discussion on the need for more female representation in the academic and professional environment.
- Lectures promote female representation, bringing women active in the STEAM areas who share their professional experiences and talk about the areas they work.
- Visits to fundamental and high Schools intend to bring schools closer to Higher Education Institutions and thus encourage more and more girls to follow in the areas of STEAM, deconstructing gender prejudices that are still very present in the exact areas and technologies.

For the fellows, the project is a way to make a difference, connect and fight for gender equality and equity by creating a community that encourages young researchers' interest, participation, and training in STEAM careers. Through the project, the students became protagonists in the development of affirmative action. They were able to use their creativity and autonomy to develop initiatives at the university and develop communication skills, leadership, and skills to solve everyday problems that led to increased female representation in the fields of science and technology.

3 FINAL REMARKS

We present some strategies, actions, and partnerships that the Women in STEAM task have been developing to encourage the permanence of women in the predominantly male courses at the Federal University of Amazonas, as well as the incentives to attract girls to these areas. Education can equip students with the knowledge, skills, attitudes, and behaviors needed for an inclusive and sustainable society. Studies show that supportive learning environments improve girls' confidence and self-efficacy in STEAM areas, and we can see this up close with our activities. The project has made a big difference at the University, but there is still a long way to go. The activities of the Women in STEAM task crossed the barriers and reached other areas of knowledge, such as journalism, psychology, and architecture. The project currently has the creation of the Good Practices Manual underway, which aims to indicate good practices for social interaction in the academic environment, presenting important concepts about gender inequality and actions to promote the inclusion and representation of girls and women in the fields of STEAM and a follow-up survey on the entry and permanence of women in courses covered by the SUPER project. In constant construction is the planning of more initiatives that can contribute to a more robust support network among the students and promote social inclusion by reducing differences with the dissemination of scientific knowledge. A project encouraging discussion about gender in the academic field is vital, as it historically brings visibility to minority groups and shows that decision-making needs to be more diverse and representative. To this end, we seek

to raise men's awareness of stereotypes rooted in society, increasing mutual respect between individuals of the opposite sex and propagating the idea of encouraging and supporting girls to follow their career desires to the highest possible degree. By showing that women can play an active and meaningful role in STEAM areas, it is possible to inspire more girls and young women to pursue careers in science and technology, contributing to a more equal and diverse future.

ACKNOWLEDGMENT

This research, carried out within the scope of the Samsung-UFAM Project for Education and Research (SUPER), according to Article 48 of Decree n° 6.008/2006(SUFRAMA), was funded by Samsung Electronics of Amazonia Ltda., under the terms of Federal Law n° 8.387/1991, through agreement 001/2020, signed with Federal University of Amazonas and FAEPI, Brazil.

REFERENCES

- [1] Portal do Amazonas. [n.d.]. *A crescente contribuição das mulheres para a Ciência, Inovação e P&D (in Portuguese)*. Retrieved April 22, 2023 from <https://portaldamazonas.com.br/2023/04/13/a-crescente-contribuicao-das-mulheres-para-a-ciencia-inovacao-e-pd/>
- [2] Jeovana Leao, Adrya Araujo, Bruna Souza, Julis Araujo, Kalil Ferreira, Mariana Barros, Tanara Lauschner, and Fabíola Nakamura. 2020. Uma análise regional sobre o perfil de estudantes concluintes em cursos STEAM através do ENADE. In *Anais do XV Women in Information Technology* (Cuiaba, Brasil). SBC, 200–209. <https://doi.org/10.5753/wit.2021>
- [3] Jessie Silva. [n.d.]. *Mulheres na ciência: pesquisadoras que atuam no cenário científico do Amazonas (in Portuguese)*. Retrieved April 23, 2023 from <http://www.fapeam.am.gov.br/mulheres-na-ciencia-pesquisadoras-que-atuam-no-cenario-cientifico-do-amazonas>
- [4] Projeto Super. [n.d.]. *Projeto SUPER - Fomentando a educação e a pesquisa (in Portuguese)*. Retrieved April 20, 2023 from <https://super.ufam.edu.br/>
- [5] Unesco. [n.d.]. *Meninas e Mulheres em Ciências, Tecnologia, Engenharia e Matemática (in Portuguese)*. Retrieved April 24, 2023 from <https://pt.unesco.org/fieldoffice/brasil/news/meninas-e-mulheres-em-ciencias-tecnologia-e-matematica>