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## INTEGRATED ACTION OF UNIVERSITY EXTENSION PROJECTS IN A RURAL COMMUNITY IN THE LOWER AMAZON REGION

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**Abstract:** The university extension projects “Soil Science - from the countryside to the city” and “EDUCT - Juruti: Access to scientific and technological education by young people from public schools in the municipality of Juruti”, both linked to the Agronomy in Focus Program, came together to carry out an itinerant action in a rural community in the municipality of Juruti, located in western Pará university extension, in the Lower Amazon region. These projects, which have been working together since 2023, aim to integrate the university with community, bringing the, exchanging and building knowledge in partnership with local school communities. The aim of this action itinerant was to bring students from a rural community into contact with scientific and technological education through experiments and lectures. The aim is to arouse interest in technological education, encouraging students to continue their studies and bringing them to closer the university. The university extension action was carried out by a team of 22 students and 3 teachers linked to the Bachelor of Agronomy course at CJUR/UFOPA, who developed practical and didactic activities related to the agricultural and biological sciences. The topics covered in the workshops were: i) Fruit formation; ii) Soil formation; iii) Soil erosion; iv) Ecological paints made from soil; and v) “Getting to know the genetics of the Scoiso family”. The activities were held at the Amauri da Silva Moraes Municipal Elementary School, located in the São Paulo community, approximately 30 kilometers from the center of the municipality of Juruti-PA. The action was divided into two days, with the first day being for students on the afternoon shift and the second day for students on the morning shift, covering classes from the 1st to the 9th year of elementary school. During the workshops, participants were introduced to the projects and the team, promoting integration between everyone. The

didactic methodology used in the actions provided the participants with new knowledge about genetics, environmental education and awareness of sustainability. In this way, the development of university extension actions such as this one play a fundamental role in the teaching-learning process, forming aware multipliers and encouraging them to continue their studies.

**Keywords:** Integration; Amazon; Education; Sustainability.

## INTRODUCTION

According to the study carried out by Flores and Mello (2020), University Extension plays a crucial role in the academic and human formation of students, providing an experience that transcends the boundaries of the classroom. By enabling the integration of theory and practice, extension allows students to apply the knowledge acquired in their courses to real, everyday situations, contributing to their academic, personal and professional development (RODRIGUES *et al.*, 2013). The development of extension projects, which cover social, cultural actions and/or educational, favors the development of practical and interpersonal skills in students, enabling the formation of critical professionals who, ethical are aware of the locality in which they are being trained (SOUZA, *et al.*, 2017). In addition, university extension promotes a greater understanding of social, political and economic challenges, broadening students' worldview and stimulating their commitment to social transformation.

Participation in extension programs contributes significantly to the development of students' citizenship and social responsibility. In addition, University has proved to be a powerful tool in strengthening the link between the university and society, promoting, Extension richer and a sense of belonging and participation in institutions more mea-

ningful learning as well as fostering (FLORES; MELLO, 2020). In this sense, extension not only complements academic training, but also plays a crucial role in the personal maturation of students, encouraging them to become active agents of change in their communities and giving them autonomy in the construction of the teaching-learning process.

In this context, the University "Extension project EDUCT-Juruti: Access to scientific and technological education by young people from public schools in the municipality of Juruti - EDUCT-Juruti" has been working since 2020 to bring the university and the community closer together Juruti by disseminating topics related to scientific and technological education. The project works with students from public schools primary and secondary, as well as early childhood education, making it possible to share and build knowledge, as well as promoting interaction between all those involved. The "Soil Science-extension" project, created in 2023, aims to bring knowledge from the countryside to the city, promoting a greater relationship between farmers, agriculture, the university and both communities the urban and rural, with a focus on soil science concepts.

Most of the extension activities carried out by the Bachelor of Agronomy course at CJUR/UFOPA take place in schools in the urban area or involve welcoming students and local residents to the *campus* itself. However, schools located in rural areas end up being isolated from these activities and, in order to overcome this situation, were the projects brought together to provide a more consolidated and informative activity for the community rural. In this context, the was selected Amauri da Silva Moraes Municipal Elementary School, located in the São Paulo community, approximately 30 kilometers from the center of Juruti/PA. The school serves students from the 1st to the 9th grades in the morning and afternoon shifts.

In this sense, the aim of this work was to promote integration through university extension, introducing students from the rural community of the Amauri da Silva Moraes School to scientific and technological education. The aim was to encourage them to continue their studies and bring them closer to the University Campus Juruti (CJUR).

## METHODOLOGY

The integrated university extension actions were developed by a team of 22 students and 3 teachers, all linked to the Agronomy course at the Juruti University Campus of the Federal University of Western Pará (CJUR/UFOPA). The activities took place in September 2023 at the Amauri da Silva Moraes Municipal Elementary School, located in the São Paulo community, in the municipality of Juruti,, with students from state of Paráthe 1st to the 9th grade, in the morning and afternoon shifts.

To carry out the action, were organized and developedthe following activities : i) Research into practical activities related to the areas of knowledge of Chemistry, Soil and Science Biology; ii) Selection of five thematic workshops, namely: 1) Soil formation; 2) Fruit formation; 3) Soil ; erosion 4) Soil paint; and 5) Getting to know the genetics of the “Scoiso” family; iii) Drawing up questionnaires to evaluate the activities carried out by the projects; iv) Organizing and previously developing the experiments carried out in the extension actions; and v) Carrying out the action at the Amauri da Silva Moraes School.

The following workshops were at the schoolorganized to present the action :

*1) Soil formation:* An illustrative panel on the different soil classes and a teaching box were used to show the process of soil formation. The following materials were: sedimentary rocks, gravel, samples of soil horizons A, B and C, used to make the

boxa wooden box (30 x 50 cm with a depth of 5 cm), white school glue and a spray bottle with water. The layers of soil formation were assembled inside the box, allowing the be seendifferent classes of soil and their multiple functions to, providing moments of fun and interaction between the students.

*2) Fruit formation:* An panel was set up explanatory on flower structure and the different types of fruit acquired, which are classified as: fleshy and dry fruit. The workshop was aim of to show thehow fruits are formed, from fertilization in the flower to the seed, and to point out their structures (epicarp, mesocarp and endocarp). It was a didactic activity aimed at promoting knowledge and learning about botany in elementary school.

*3) Soil erosion:* The aim of the workshop was to raise awareness of the effects of erosion processes in areas with and without vegetation, in order to show the importance of soil cover in preventing and reducing erosion, as it is one of the main causes of environmental degradation, urban areas. The following materials were used for the workshop: both in rural and a PET plastic bottle with a of grass in the soilclump; a PET plastic bottle PET with 2 kg of soil covered with dead vegetation; a plastic bottle with 2 kg of loosened soil with no cover. vegetation A PET bottle with small holes in the lid was also used to simulate rain on the soil with the different coverings. The aim was to demonstrate the importance of soil cover for environmental preservation, given the different colors of water (with more or less soil) coming out of each of the PET bottles used.



4) *Soil paint* Soil :samples of different colors were collected, dried and sieved, then mixed with water and glue (ratio of 2 parts soil + 2 parts water + 1 part glue) to prepare paint. Mixing the different soil samples made it possible obtain intermediate colors. To ensure good consistency and adhesion of the paint, the soil should contain more clay and silt and less sand (CARMO; TEIXEIRA, 2014). After preparing the soil paint, the students made artistic paintings on paper and/or fabrics, encouraging creativity and promoting sustainability, as well as emphasizing the importance of soil conservation.

5) *Getting to know the genetics of the “Scoiso” family*: Inspired project developed by the by center USP’s genetics, were felt puppets made representing the Scoiso couple, with the aim of teaching students about phenotypic variation through reproduction. This simulation showed how phenotypic characteristics (sex, antenna color, tail shape, wing spot) of the couple are passed on to their offspring in different combinations. This activity provided a didactic way of teaching genetics to students, encouraging learning in a practical and fun way.

## RESULTS

The action carried out at the Amauri da Silva Moraes Municipal Primary School, located in the São Paulo community in the municipality of Juruti-Pará, involved the participation of enrolled students aged between 6 and 16. The workshops were held simultaneously in the classrooms and the project volunteers and scholarship holders were divided into 4 teams, with 1 teacher responsible for each group (Figure 1).



Figure 1 - Team responsible for the workshops on day (A)1 ; team on day (B).2

Source: Project Collection, (2023).

The use of an illustrative panel with the different classes soil and a didactic box illustrating soil formation provided students with an understanding of the complexity and time it takes to form a soil horizon, emphasizing the importance of soil preservation, as well as spreading knowledge about the different classes present in soil and their multiple functions. These experiences enabled them to understand how to plant and manage the crops grown in the municipality, as well as providing moments of fun and interaction between the students (Figure 2A).

The workshop on soil erosion, presented through a didactic experiment, was essential for highlighting and explaining to the students the importance of natural vegetation cover, which in addition to the loss of minerals and nutrients through leaching, eroding soil reduces the infiltration capacity of water and increases surface runoff, mainly affecting rural families who work in agriculture (Figure 2B).



Figure 2 - Soil (A)formation workshop ; Soil (B).erosion workshop

Source: Project Collection, (2023).

The workshop “PaintSoil “ provided students with an understanding of the variation in soil colors, which is due to the different materials of origin and the position of these soils in the landscape. The greater the amount of organic matter, the darker the soil, generally this soil coloration is found in the “A horizon”. Reddish and/or yellowish soils have different types of iron oxides in their composition; soils with excess water and poor drainage have a grayish color; and light soils have a high amount of quartz in their composition. Environmental education, using soil paint as teaching material, aroused the students’ curiosity and made it easier for them to learn about the diversity of colors present in different types of soil, reinforcing new possibilities for the use of sustainable this resource (Figure 3).



Figure 3 - Presentation of the Soil, Paint Workshopshowing the different colors of soil.

Source: Project Collection, (2023).

In the workshop “Fruit Formation”, the students observed the entire structural part of a flower, learning about the origin and classification of the different types of fruit. This promoted basic knowledge about botany, as well as stimulating integration and curiosity among the students (Figure 4A). The dynamic activity “Getting to know the genetics of the Scoiso “ made it possible to learn about concepts such as genefamily, gamete,, phenotype, genotype, homozygote and heterozygote. The couple was presentedScoiso, drawing the students’ attention to the phenotypic characteristics that the couple’s children would express after reproduction. It is important to emphasize that these phenotypic variations occur due to the processes during gamete formation, since organisms are formed by diploid cells (Figure 4B).







Figure 4 - Fruit formation workshop (A); dynamic activity “Getting to know the genetics of the Scoiso “ family(B).

Source: Project Collection, (2023).

At the end of each activity, were given the participants questionnaires to evaluate the action, consisting of the following questions: 1) Gender; 2) Age; 3) Have you ever heard of the Federal University of Western Pará (UFOPA)? 4) Did you know that there is a UFOPA Campus in Juruti? 5) Would you like to visit the UFOPA Campus?; 6) Did you already know about the Agronomy course?; 7) Have you ever heard of the EDUCT and Soil Science projects; 8) Did you enjoy taking part in this extension action?; 9) Had you seen any of the practices presented before?; 10) Which of the activities caught your attention the most?; 11) When you finish your studies, are you interested in going to university?; 12) Which university (course) you intend to do?

Among the participants, 63 students, including some of the school's teachers, answered the questionnaires, 39 of whom were male, the majority 8-16aged. Analyzing the data obtained, the students revealed that they enjoyed taking part in the action, 26 of whom had already seen the activities presented. The most

popular workshop was “Scoiso Family” (24%), followed by: Soil erosion (23%), formation Fruit (21%) and Soil Formation (21%). In addition, 11% of participants liked all the themes.

Among the participants, some already knew about the agronomy course, while others were unaware of the existence of a Federal in JurutiUniversity, which shows the importance of spreading the word and bringing people together with activities of this kind. However, many participants showed an interest in visiting the UFOPA campus, since the vast majority of students are interested in going to university. Among the courses indicated, Agronomy and a career in the police force were the most frequently mentioned, but some students still are undecided about which one to go for

## CONCLUSION

University extension activities are of fundamental importance in bringing the university closer to the non-academic community, creating a two-way street for exchanging and building knowledge. In addition, the university students involved in the activities apply their technical knowledge and become aware of the reality that surrounds them, making them aware of the changes needed in the community.

In view of this, actions that provide access to scientific and technological education in both urban and, above all, rural areas aim to enable the assimilation, sharing and construction of knowledge in a participatory way and interactive. This being the case, and based on the evaluation of the action, participants' the activity, stimulating the planning of more itinerant actions is considered positive by the projects involved. In addition, contact with different areas of knowledge can encourage students to continue their studies and study aim to at university.

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