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Intervention in Sete Lagoas about the Cerrado biome

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Abstract. The Cerrado biome, predominant in the region of Sete Lagoas is marked by fruit species of the local flora, such as: Araticum, Cagaita, Jatobá, Mangaba, Pequi, among others that are not always known by the community. Environmental education is an important tool for awareness and preservation of the local biome. The extension program aims to bring the community knowledge of the biome and the typical fruit species of the region that are not known and recognized. Inducing a new look and expanding knowledge among students in order to highlight the biome and its characteristics in a playful and didactic way. The program was successful in interventions and achieved satisfactory results in relation to students' perception of classroom work, extolling the biome in which they live, generating new multipliers. The work done in an interdisciplinary way achieved an increase in the percentage of correct answers compared to the numbers obtained before the interventions.
Keywords: Cerrado; Fruit Species; Environmental education; Extension.

Introduction

Environmental education is challenging and strongly contributes to sustainable development because, when well structured, it emphasizes men's relationship with the natural environment, ways of conserving it, preserving it and properly managing its resources (UNESCO, 2005).

And it is this indispensable tool that allows the individual and the community to reflect on the building of new social and ethical values and the development of attitudes towards the conservation, utilization and proper handling of natural resources, without compromising future generations (SILVA et al. , 2014).

KINDEL et al., 2006 state that the learning process begins with children and should be inserted in the school and also in the students' daily life, to provoke a critical look of them in the continuous search for improvements to environmental problems and use of natural resources in a sustainable manner.

he Cerrado biome is the second largest Brazilian plant formation, being quite heterogeneous and peculiar (Maffei et al., 2011; Maracahipes et al., 2011). And it is in this unique biome that the city of Sete Lagoas-MG meets.

Even quite degraded or replaced by pastures and plantations, due to the various transformations caused by man, two native fruit trees of the Cerrado that stand out in Sete Lagoas is the cagaiteira and pequizeiro (RODRIGUES et al., 2016). These are fruit species that are not properly exploited and devalue by the local population.

GUEDES et al. 2017, states that exotic or native Brazilian fruits have great nutritional, economic and social potential. These fruits are exploited extractively and, as they are seasonal, large postharvest losses occur.

In which the fruits of the Cerrado occupy a prominent position due to their economic potential, contribution to the income generation of individuals belonging to groups in social vulnerability and, especially for the food use, valuing the cultural identity of the community, improving food and contribution. nutritional They are traditionally used by the local population through fresh consumption or processed as juices, liqueurs, ice cream, jams and sweets (CARDOSO et al., 2011; RODRIGUES et al., 2016).

Students in this biome need an approach to these species as part of their reality and existence, as they are often used by their parents and family for medicinal and ornamental purposes and go unnoticed without real value appropriation. This reality is also easily seen when observed in urban afforestation, in which native species have been replaced by exotic species, demonstrating contempt for the richness of local flora (CRUZ et al., 2018).

This stage of the Extension Program aimed to verify the knowledge of elementary school students (6th, 7th and 8th years) about fruit species in the Cerrado,

providing support materials on environmental preservation and generally seeking to analyze if there was change in the perception of students before and after the execution of extension activities. The process of knowledge of biomes must be subsidized by an environmental awareness by the population. Thus, conducting classes with different methodologies is of fundamental importance for the formation of this reflection on the building of new social and ethical values and on the development of attitudes towards the conservation, use and proper handling of natural resources, without compromising future generations (Cross et al., 2018).

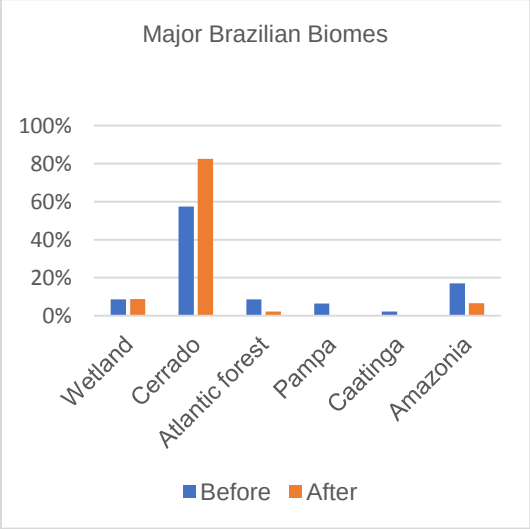
Methods

The extension work was carried out with 156 students from a state school in the city of Sete Lagoas, with classes of 6th, 7th and 8th grade.
It took place in 3 stages in the first half of 2019.
2.1 Initial Diagnosis:
At this stage a questionnaire and a game were applied, containing questions about the Cerrado biome, its fauna and flora. This method was used to understand the students' difficulties and knowledge about the biome that is inserted, and to quantify the results obtained with the other steps.
2.2 Classes and teaching material:
In this stage, lectures were held, through slides and with the support of a booklet designed and intended for elementary school with the theme "Fruits of the Cerrado: Economic and Social Importance for the population of Sete Lagoas and region." This booklet works on environmental education integrating the areas of history, geography and science. Addressing the importance of the Cerrado as a Brazilian biome, morphological and botanical characteristics of this domain, Cerrado flora, importance of Cerrado fruit species, ecological relationships present in the development of these species. The booklet (figure 1) consists of theoretical and practical content and fixation exercises designed for students.
2.3 Final Diagnosis:
At this stage, a questionnaire and a playful approach were applied through a board game (Figure 2). The questionnaire contained the same questions so that it was possible to measure before and after data, and the results that the interventions achieved. The board game questions were based on the content worked during the interventions.

Figure 1: Image of the cover of the primer used in elementary school

Figure 2: Board game "Cerrado em Focus", made in size 110 x 80.

Results and discussion:
There were 156 participating students. The predominant age range of students was between 11 and 16 years. All results of each year (6, 7 and 8) were analyzed separately, where classroom interventions were applied.
One of the questions of the questionnaire sought to identify students' knowledge about the Brazilian biome in which the city of Sete Lagoas is inserted, in this question there were 6 Brazilian biomes as an option, before the interventions we obtained a number of hits lower than the obtained numbers. after the work done. The graph below represents the data obtained in the 6th grade classes.

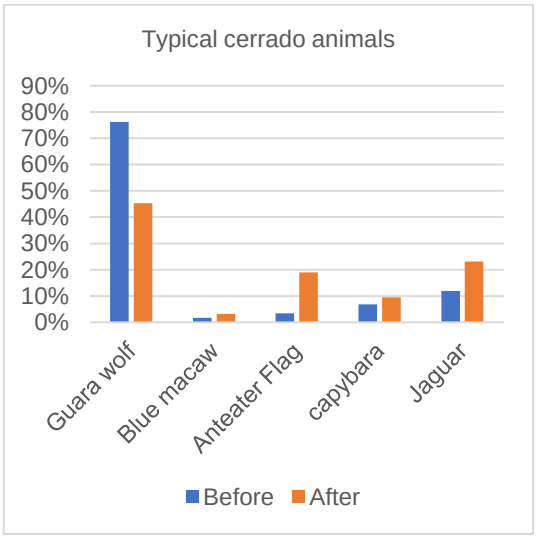


Graph 1: Percentage of 6th grade answers before and after the interventions of the question, "What biome is the city of Sete Lagoas inserted in?".

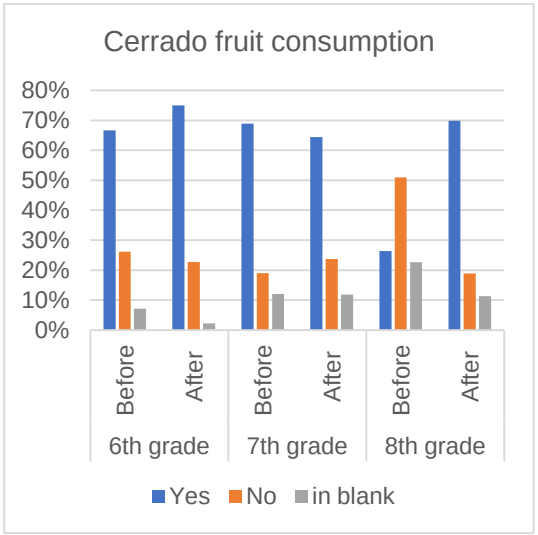
In the 6th and 7th grade classes, there were satisfactory gains in student learning, reaching a higher percentage of correct answers after the interventions, while in the 6th grade classes, there was a 0.5% decrease in the number of students. compared to the numbers obtained before the interventions, it can be stated in this case that the degree of interest presented by the students on the subject is of fundamental importance for learning gains, since in all the classes the method applied did not differ from each other.

The second question asked to the students was: "What are the typical animals of the Cerrado?", In the options to be pointed out there was more than one typical animal, being expected to indicate in greater number the maned wolf, because he is the animal cerrado symbol 17% (6th year), 22% (7th year) and 76% (8th year) marked maned wolf as typical animal. After the interventions 46% (6th grade), 42% (7th grade) and 45% (8th grade) indicated the maned wolf. Compared to the results before and after the interventions, grade 8 reached a lower percentage after, this is due to the fact that the students recognized the other animals as the cerrado after the interventions in the classroom. Graph 2 shows the results of the 8th grade classes, and these results are also representative of the other worked groups.

The third question of the questionnaire was whether the students had already consumed cerrado fruits, in the 6th grade reached 67% of answered yes, in the 7th grade 69% and in the 8th 26%. After the interventions the values went to 75%, 64%, 70%. In the 6th and 8th grade classes the number of students who marked the yes option increased, and in the 8th grade the number increased to 44%. This is due to the fact that during the program there was the presentation of each fruit, from the best known to the least popular, so many who previously thought they had never consumed because they thought that a certain fruit was not typical of the cerrado after learning could realize that the fruits of the cerrado were indeed present in their diet. Graph 3 represents the results of the 8th grade classes.



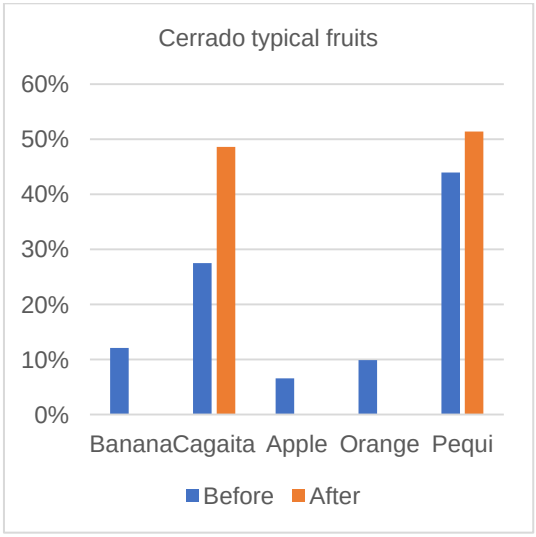
Graph 2: Percentage of answers from the 8th grade before and after the interventions, from the question, "What are typical Cerrado animals?".



Graph 3: Number of students who consumed cerrado fruits.

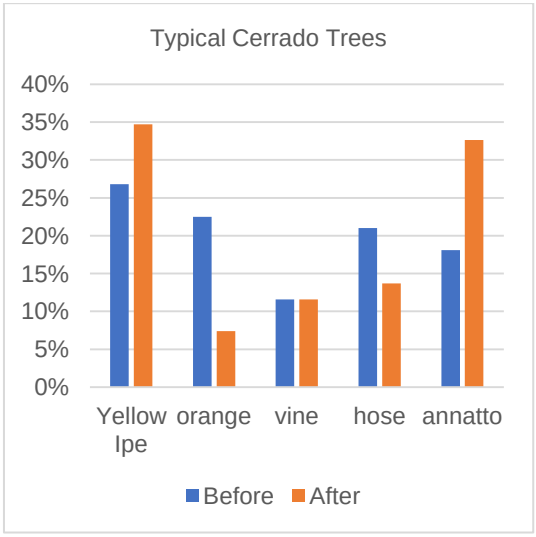
The fourth question asked students to identify the typical fruits of the cerrado among five alternatives, where two options were correct and the others were tropical fruits. Prior to the interventions in the 6th, 7th and 8th grade classes, the most noticeable fruit was pequi, as this fruit is the best known in the region, with values of 44%, 33% and 55%. Although the fruit chosen in the highest percentage is a correct answer, it was also obtained a large number of choices in tropical fruits, presenting difficulties of choice and differentiation between them. In the second moment of the application of the questionnaires in the 6th grade classes, there were only assimilations in the cagaita and pequi options,

in the 7th and 8th years, although there were assimilations in the tropical fruits, these numbers were small, showing a higher percentage in the correct fruits.



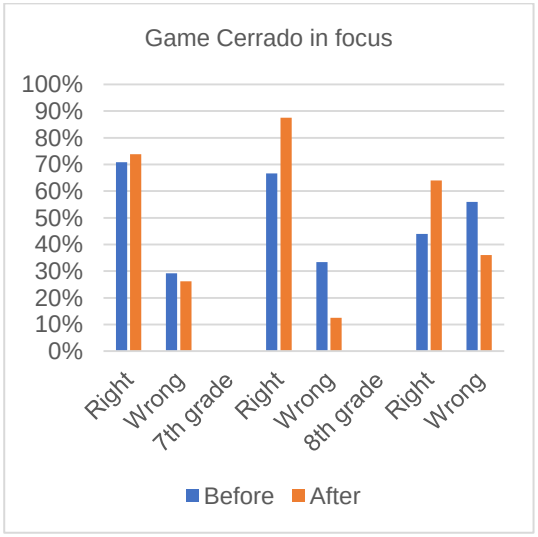
Graph 4: Percentage of 6th grade answers before and after the interventions, from the question, "What are the typical fruits of the Cerrado?".

The fifth question asked the students was about the typical trees of the cerrado, in this question there were five options to mark, among which only 2 were the correct answers (Urucum and Ipê Amarelo). In the 6th and 8th grade classes the highest percentage of the answers was the correct one, but the number of correct answers compared to the other answers were not so significant. After the completion of the program, the number of hits increased significantly, with 6th year yellow Ipê being the most chosen with 50%, 7th yellow Ipê and Urucum with 33% and 35% respectively and 8th year the yellow Ipê with 57%.



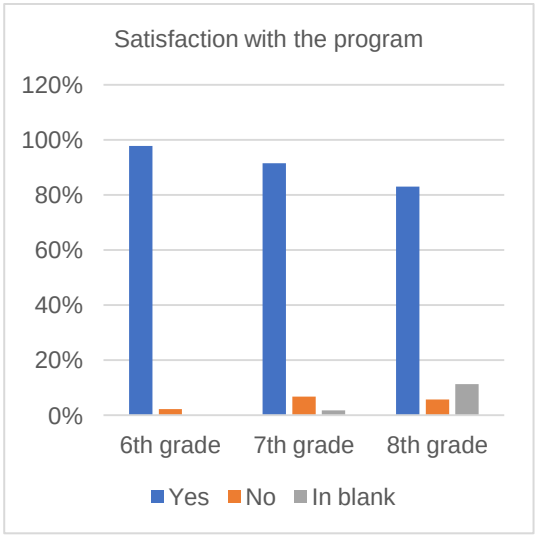
Graph 5: Percentage of 8th grade answers before and after interventions, from the question, "What are typical Cerrado trees?".

In addition to the questionnaire was also applied a board game "Cerrado in focus" in two moments as well as the questionnaire before and after the interventions. The game contained question about the biome, fauna and flora. The questions asked were varied more broadly than the questionnaire. Prior to the interventions 71%, 67% and 44% of correct answers were obtained in the 5th, 6th and 7th grade classes respectively. After the interventions the number of hits increased to 74%, 88% and 64%. The graph below is a comparison of the results of all classes.



Graphic 6: "Right and wrong" answers of the "close focus" game before and after the interventions.

Finally the students were asked whether they liked the program or not, in the 6th grade 97.78% answered yes, in the 7th grade 91.53% and the 8th 83.01%. The project achieved a high level of satisfaction, demonstrating that working in a playful and interdisciplinary way is a good way to teach.



Graph 7: Percentage of student satisfaction with the extension program.

Conclusion

By analyzing the results compared to the data analyzed before the interventions, it can be stated that there were significant gains in the students' knowledge about the biome and the characteristic fruits of the region, thus forming people able to multiply and perpetuate the advantages of including the fruits in the region, thus improving the quality of life, besides making the population aware of the importance of preservation.

Although the methodology applied is the same in all classes, there were differences in the results of the different grades, showing that the success of the program is related to the interest and curiosity of the students.

References

CARDOSO, E. L. *et al*. Qualidade química e física do solo sob vegetação arbórea nativa e pastagens no Pantanal Sul-Mato-Grossense. Revista Brasileira de Ciência do Solo, v. 35, n. 02, p. 613-622, 2011.

CRUZ, Temile Santana da et al. Percepção dos alunos do ensino médio sobre as espécies arbóreas do bioma cerrado nas escolas estaduais da cidade de barreiras – BA**.** Revista Gestão & Sustentabilidade Ambiental**,** [s.l.], v. 7, n. 1, p.580-595, 19 fev. 2018. Universidade do Sul de Santa Catarina - UNISUL. http://dx.doi.org/10.19177/rgsa.v7e12018580-595.

GUEDES, Mayara Neves Santos et al. Minerals and phenolic compounds of cagaita fruits at different maturation stages (Eugenia dysenterica). Revista Brasileira de Fruticultura**, [**s.l.], v. 39, n. 1, p.1034-1044, 2017. FapUNIFESP (SciELO). http://dx.doi.org/10.1590/0100-29452017360.

KINDEL, E. A. I.; SILVA, F. W. da; SAMMARCO; Y. M. Educação ambiental vários olhares e várias práticas. Porto Alegre: Editora Mediação, 2006. p. 107

Maffei, F.; Ubaid, F. K. e Jim, J. Anurofauna em área de Cerrado aberto no município de Borebi, estado de São Paulo, Sudeste do Brasil. *Biota Neotrop.* Abr/Jun 2011 vol. 11, no. 2 http://www.biotaneotropica.org.br/v11n2/pt/abstract?article+bn04011022011 ISSN 1676-0603.

Maracahipes, L.; Lenza, E.; Marimon, B.S.; Oliveira, E.A.; Pinto, J.R.R. & Marimon Junior, B.H. 2011. Estrutura e composição florística da vegetação lenhosa em cerrado rupestre na transição Cerrado-Floresta Amazônica, Mato Grosso, Brasil. Biota Neotropica 11: 133-141.

RODRIGUES, D. B. et al. Preservation of the Cerrado produces fruits: fruit of the cerrado project in the microregion of Sete Lagoas, Minas Gerais. Scientific Electronic Archives, [s.l.], v. 10, n. 4, p.40-44, 11 ago. 2017.

RODRIGUES, D. B.; COSTA, L. T.; MELO, C. P. O. F.; SOUZA, A. G.; GARCIA, E. M.; TAROCO, H. A.; MELO, J. O. F. Analysis of project about Cerrado fruits developed with students from two public schools. Scientific Eletronic Archives.v. 9: 3, 2016

SILVA, E. A.; OLIVEIRA, C. A. M.; CUNHA, R. R. C. A.; SOARES, R. V. S.; TEIXEIRA, V. D.; GUENTHER, M. Educação Ambiental Voltada Para A Reutilização E Reciclagem Dos Resíduos Sólidos No Ambiente Escolar: Um Estudo De Caso No Ensino Fundamental Em Recife (PE). Revista Brasileira de Educação Ambiental, v.9, n. 2, p. 412-423, 2014.

UNESCO. Década da Educação das Nações Unidas para um Desenvolvimento Sustentável, 2005-