

Soil and environmental education

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Abstract

This project carried out in the APTA Research Unit - Pólo Regional Centro Norte, São Paulo State, Brazil, since 2005 was motivated by the previous environmental program “Environmental Education Program on Water Resource Management” (FEHIDRO project 132/02). Based on the relationship between community, education and research institutions it was financed by a state fund for Water Management (FEHIDRO) and managed by the Turvo and Grande Rivers Drainage Basin Committee (CBHTG). The project offered continuous monitored visits to educators, teachers and students with some practical field activities on soil conservation and water management concepts. At the same time a qualification program focused on educators was carried out to give them enough knowledge and support to work with the technician themes at school with the students before they come on the field monitored visit. The project offered training for 50 educators at a time. The aim of the project was to raise the interest of educators on environmental topics they can experience when visiting the research unit so they could work and develop these concepts with the students. A crew of environmental monitors is well prepared and enabled to transfer technician knowledge to students and this way act as multipliers in the local communities. The monitors developed 24 didactic activities based on the science school schedule as well the hydric resource preservation, soil conservation and the drainage basin recognition. The mission of the research unit is to generate and transfer knowledge in the region and this project has made a great contribution to justify the existence of the Pólo Regional Centro Norte to the community. This project involved 66 municipalities that are part of CBH-TG and 31 linked to the Regional Teaching Directories of São José do Rio Preto, Catanduva, Votuporanga, and José Bonifácio cities of São Paulo state, enabling educational work through drainage basin conceptualization, water resources conservation and soil conservation practices; monitoring learning activities in environmental education program developed in the research unit area and activities.

Key Words

Environmental education, water resources conservation, soil conservation, water source management.

Introduction

The environmental subject has always been emphasized in the Pólo Regional Centro Norte, first called *Estação Experimental de Pindorama*. There are monitored visits recorded since the 1940s, with the regional community participation (producers and educational institutions). Four remaining forest fragments with a total area of 120 hectares are classified as biological reserves and concentrate an important natural patrimony of the São Paulo State. Actually the Pólo Regional Centro Norte is considered a reference of soil conservationist practice and an educators training center. Working with the CBH-TG and Regional Teaching Offices, the centre has led some projects using fund from the FEHIDRO (Hydric Resources State Foundation) since 2005 where it has transferred knowledge and educator capacity as well as didactic activities within the environmental theme, involving the regional community. The project proposes to develop direct environmental education, using playful and educational activities in monitored visits in the field. In addition, an innovative teaching practice in the region was adopted, using research center facilities to provide natural resources preservation concepts, drainage basin recognition, use and occupation of soil and water concepts through the practical experiments that already happen in the area which are afterwards used in the classroom using interdisciplinary concepts. In addition to these activities it offers to a 50 educator groups a capacity building training which is 96 hours long. The project " *Bacia Hidrográfica: Um Instrumento na Educação* ", FEHIDRO 0039/04, officially started in June 2005 and it has already four years of activity. During this period, 14,500 students visited the project, with 460 educators from 40 cities of the CBH-TG and also other committees. In 2008, the project won the prize of most significant environmental education practice in water resource from the VI Inter Drainage Basin Environmental Education Dialog, event held annually by the DAEE (Department of Water and Energy) in Avaré, SP, Brazil. In 2009 it was again awarded the best poster presented in the VII Interbacias.

Material and methods

The first project work was invitations and folder distribution to 320 elementary schools of Catanduva and São José do Rio Preto Regional cities Education of Offices. They schedule a monitor visit in each 29 cities that belong to these offices. This work includes meetings with the educators, where the monitor present some previous propose of activities already done in the project. This stimulates the monitored visit that can be scheduled in the Unit. In August 2005 the monitored visits started and they ended in December 2005. In this period approximately 190 visits occurred involving 33 students each, totaling 6270 members of public and private schools of 12 cities from the CBH-TG. In the first bimester of 2006 and through 2007 delivered invitations and folders were delivered in the 37 cities of the José Bonifácio and Votuporanga Regional Education Offices In 2008 and 2009, 274 monitored visits and 8200 students with their teachers participated in the Unit activities related to the project. After the monitored visit of the qualification program in the Polo Centro Norte, Pindorama, SP, Brazil, teachers worked on the subject in fields in classrooms, involving the several disciplines of Portuguese, History, Geography, Mathematics, English, Art and Biology. It is important to emphasize that each school's pedagogic coordination has to motivate and coordinate their educators to this interdisciplinary work. Such action requires a constant communication between educators and a prior definition of themes and concepts that will be adopted into the classroom to guide the pedagogic activities related to previous activities experienced in the field by the educators.

Activities with the students

At the end of each visit the environmental monitor asks the respondent for the visit to "return" a report, to evaluate the knowledge and concepts acquired by the students. As a practical result at the end of the work the coordinators of the program have a compilation of work with poetry, drawings, thematic research, and other activities. For the educators, when students experience live situations related to environmental and water studies as a central theme, students are able to cover the subject in all disciplines. So, an environmental education experience in drainage basin recognition supported through induction, perception and conscience is established with 24 didactic and practical activities developed in the field with the students. Students are encouraged to experience the school textbooks programmatic content in a practical way. All activities in the research unit are based on the following themes: preservation of water resources, soil conservation and drainage basin recognition. For each student grade a set of activities was chosen, changeable every six months, according to the following classes lessons: maps observation to recognize water points, forest explanation, seed germination, animal watching in ponds, culture recognition, simulation of the impact of rain on the ground, water in the Globe, Ecologic Kit (ECOKIT) for water analysis, Secchi disk activity, soil profile watching, rational use of irrigation water, recognition of a drainage basin, recognition of a weather station and others.

Capacitating of the educators multipliers

At the same time a student visits, the project offers qualification training to a group of 50 educators, from public and private schools. This activity included the following cities from 2005 to 2007: Ariranha, Catanduva, Cuapiaçu, Itajubi, Novo Horizonte, Pindorama, Santa Adélia, Tabapuã, and Uchoa and in the following years the cities were: Candido Rodrigues, Fernando Prestes, Agulhas, Vista Alegre do Alto, Urupês, Paraíso, Catigua, Cedral, Pirangi, Embauba, Pindorama, and São José do Rio Preto. To promote improvement and extend the environmental thematic knowledge related to water resources, soil conservation and regional reality some seminars were offered as well practical classes by a specialized staff that gave didactic and technical support for the teachers. Afterward they could develop the work with these concepts with a interdisciplinary team and with students. Twelve Educators Trainee meetings occurred in the project from 2005 to 2007 and they were divided into three modules of 32 hours each, totaling 96 hours of activities. Due to the outstanding results presented by the educators, the 2009 phase were done in two monthly meetings, doubling the hours for qualification, changing it from a regular course to a specialization course for multiplier educators. In these meetings the teachers practiced the concepts: the Polo research activities; quality and preservation of water resources, drainage basin characterization constructing models, rationalization of irrigation water use, soil conservation, preservation and riparian forest recovery, among other issues.

Evaluation of the pedagogic process

An important point is that the process of evaluation must be constant within the project development. This can be done internally by members of staff and externally when evaluators that do not belong directly to the institution give their impressions. In this project a work plan is divided into steps and at each step the

activities were analyzed and also the progress indicators, verification methods, results, and impacts were verified. An example of applied evaluation was the questionnaires answered by the responsible educators, at the end of the monitored visit. Another interesting example is the evaluation feedback activities classroom after interdisciplinary classroom practice in the form of reports, writing texts, arts (drawings), mathematics (problems solving) and individual reports of educators about concepts worked during the visit. Those data resulted in a full assessment (criticisms and suggestions) of the work development.

Results and discussions

Due the interest that the project aroused and the number of visits that occurred after the distribution of educational material, we believe that it is necessary to perform some adjustments in the number of schools that should receive this material, because we realized that there is no way to attend all schools as intended previously. This occurred because the project surpassed expectations regarding booked monitored visits by the Unit, attending cities of other committees, a positive point related to dissemination.

We believe that the first objectives were achieved almost totally. This way we highlight that the project activities continued in 2010 which is very important and anticipated by the schools. The dissemination of the obtained results to the regional community was done in December 2007 at the First Environmental Education Meeting of the APTA Pólo Regional Centro Norte in the Rivers Turvo and Grande Bay, which brought together local authorities and an educator audience from all over the region. The event presented its program, educators report about the activities developed in the project and an interdisciplinary exhibition of works developed in classrooms. There were professionals of the Education Secretariat, Agriculture and Supply Secretariat and other institutions. This provided a diffusion of knowledge among participants and opened new regional work perspectives in this area. The activities also promoted the experience exchange among professionals and members of the community, ensuring regional participation and interaction of educators and professionals in the environmental education area. This year we will hold the second environmental education meeting, a conjugate action between Research Institutions, Turvo and Grande Rivers Hydrographic Bay Committee, Schools and Community.

Conclusions

The environmental education work when related to a interdisciplinary concept, and the institutional interchange intensifies the relationship between the educational system, community and research institution, and generate a consistent and interactive partnership. This way this proposal shows that the set of activities, using the drainage basin and soil conservation experiments located in the Apta Pólo Regional Centro Norte, as an education instrument is very interesting. it confirms that the educational process is active, not only by information acquisition, but also by the new meanings added to life through studies, research, and experiments focused on tools and methodologies to incorporate the environmental dimension into different levels and methods of teaching in an interdisciplinary way, supporting the local and regional experiments initiatives. This project opens perspectives to educators and technicians to new practices and possible themes in the education, extension, and research fields, focused on environmental preservation. The lack of information and educational material is perhaps the hardest pointing spreading and consolidating this work.

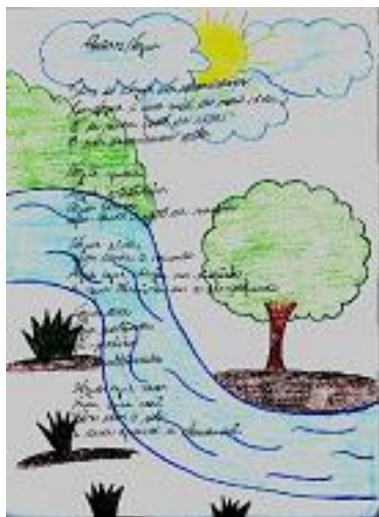


Figure 1. Poetry.

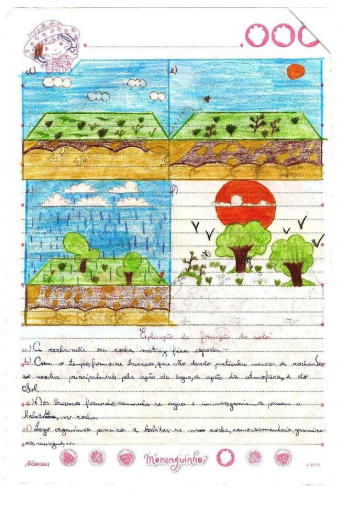


Figure 2. Thematic research.



Figure 3. Mockup.



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