

## REUSE TECHNOLOGY: USE OF PET BOTTLES IN THE CONSTRUCTION OF VERTICAL VEGETABLE GARDENS IN EARLY CHILDHOOD EDUCATION SCHOOLS

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**Abstract**— The objective of this work was to encourage the reuse of materials that would be discarded, in the case of PET bottles, for the construction of vertical gardens in schools of early childhood education. It was intended to introduce concepts of sustainability and protection to the environment, as well as encourage the consumption of vegetables so that since childhood are inserted concepts of a healthy diet. This awareness should be inserted as early as possible in the daily lives of people, thus, perform actions of environmental education, and healthy eating from early childhood education, are alternatives that should be thought and implemented aiming at the Well of the whole population. Vertical gardens were assembled in schools of early childhood education in order to encourage the reuse of materials destined to the disposal and consumption of healthy foods, in which the schoolchildren assembled their vegetable garden in their displays and Accompanied the growth of spices and followed the growth of vegetables and after using them for consumption. Environmental education activities as a technology for the reuse of materials that would be discarded assist in the development of a more conscious society and sustainable development.

**Keywords**—recycling, reuse, pet bottle.

### 1 INTRODUCTION

The PET bottle is a recognized invention in economic terms, but its disposal has become worrying causing negative impacts on the environment, being one of the most polluting waste, since its degradation can take up to 800 years, so it is of paramount importance its reuse in various processes and products. (Marques et al., 2012).

The cycle of products in the commercial chain does not end after being used by consumers, these are often discarded in improper places. Nowadays, recycling as well as the reuse of the materials used, becomes an alternative for the reuse of discarded materials, corroborating to environmental responsibility. In this sense, new reuse technologies are being developed (MUELLER, 2013).

With the development of new technologies of reuse, the aim is to environmental education to search for socio-environmental sustainability aiming at a process of transforming the environment, through

appropriate techniques of land use, and respecting the diversity of natural and contextual means of cultural contexts (Sorrentino et al., 2005).

In this work, the focus of reuse of PET bottles was the construction of vertical gardens in early childhood education schools, in order to bring environmental education and sustainability to the school environment, also with a view to encouraging healthy eating Since childhood.

## 2 THEORIES

### 2.1. REUSE OF MATERIALS INTENDED FOR DISPOSAL

Reverse logistics can be considered a form of contribution to the environment and even a profitable way through the realization of sustainable actions. Lacerda (2002) and Barbieri e Dias (2002) emphasize the importance of the use of waste and how these can bring positive returns, strengthening the acts of socio-environmental responsibility.

Intelligent and responsible actions with the environment can help reduce, recycle, reuse and reuse products that would possibly be discarded, especially with regard to reuse and recycling of cardboard and plastic Of packaging that would be discarded. (Scheffer at al.,2013)

### 2.2. SUSTAINABLE GARDEN IN SCHOOLS

The school garden allows several pedagogical activities in environmental and food education, assisting in environmental awareness, promotes relations of companionship and encourages the collectivity. Moreover, it stimulates the food production itself by the students, and the knowledge of sustainable agricultural practice can be transmitted to their relatives resulting in the construction of family gardens, which will establish healthy habits for all the family (FETTER et al., 2006).

## 3 METODOLOGY

This module of the project was held in a school of early childhood education, in Santa Maria-RS, next to the main lateral grillein, in the external courtyard of the school next to the school partition screen, at the end of the terrain (Figure 1). Firstly, a lecture was held on the use and importance of healthy foods and directed to the presentation to the students of the afternoon shift, with 22 children, in the range of 3 to 5 years old.

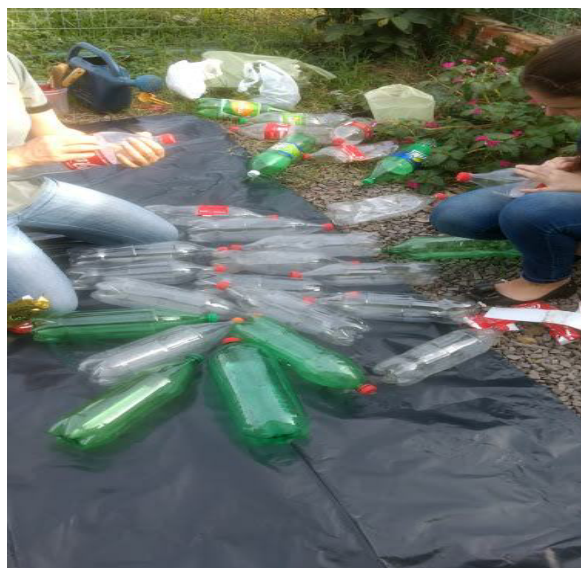
The activities to be developed were presented, which were accompanied by the teachers, so that they can continue to keep the garden as a bond of the child with healthy eating and to assemble the vertical garden, PET bottles were used (Figure 2).The garden was assembled through a display of 27 large pet bottles (Figure 3), which were cut and assembled according to the design of vertical vegetable gardens. These bottles were donated by teachers and parents, being selected by size and color, pierced and cut on the side face for the fitting of the lids and fixation on the side grid of the school where they will remain while the garden is kept in the school. The pets were assembled in sets of 3 pets in the vertical form where the surplus water from the first drain to the second and from this to third and the last to a gallon collecting the leftovers and can be reused in them. Each child chose a pet, which was placed his name and chose between different spices and salads to which he would like to plant (Figure 4). The children performed the planting with the help of the team and were instructed about the daily care of the plants.

Figure 1- Location of vertical garden in school



Source: Own Authorship

Figure 2: Bottle Preparation



Source: Own Authorship

Figure 3: Vertical Garden





Source: Own Authorship

Figure 4- Plant seedlings



Source: Own Authorship

#### 4 DISCUSSION AND RESULTS

Each student developed his display, which was confined to a bottle, made the choice of its seedling and observed the growth of it (Figure 5). Each teacher also had the opportunity to make his vertical garden.

Visits to the school were carried out for the accompaniment, guidance and encouragement of the care of the garden until the harvest, each at the end can lead its production to share with the family.

This project was of a multidisciplinary and inter-institutional and extensionist character, where different areas of knowledge were involved to obtain a satisfactory result, giving the student the opportunity to take the knowledge acquired in the environment of University for the community.

Immediately the children felt motivated mainly to be able to see grow and after harvesting their food (Figure 6). The positive feedback was immediate the implementation of the community garden in the school, part of the children with their understanding and joy and after the parents who transmitted to the teachers the

facts that the children commented and suggested to make the garden at home.

Figure 5- Prepare of the vertical garden



Source: Own Authorship

Figure 6- Plant seedlings garden



Source: Own Authorship

## 5 CONCLUSION

It is concluded that the reuse of PET bottles with their use in vertical gardens is a way to avoid inadequate disposal and assists in the preservation of the environment, considering that these vertical gardens with the bottles can be reused countless after harvesting. It was observed that the intention to instigate healthy ideas is efficient and important both for children and for the whole school community, which in this way can direct the interest of children to the practice of eating and healthy habits and reuse of Materials that would be intended for disposal.

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