

# Recycling as an Environmental Awareness Tool in Public Schools: Working with Waste and Building Values in a Brazilian City

Elissa Stephanie de Oliveira Torres<sup>1</sup>, Rayssa Maria do Nascimento<sup>1</sup>, Gyovanni Dhieymyson Oliveira Lima<sup>1</sup>, Rosiane Leite dos Santos Soares<sup>1</sup>, Juliano Keyton Dantas<sup>2</sup>, Fábio André Bispo de Melo<sup>1</sup>, Dany Geraldo Kramer<sup>1,\*</sup>

<sup>1</sup>Faculty of Health Sciences of Traíri – FACISA, Federal University of Rio Grande do Norte, Brazil

<sup>2</sup>Secretary of Education, Federal University of Rio Grande do Norte, Brazil

\*Corresponding author: [dgkcs@yahoo.com.br](mailto:dgkcs@yahoo.com.br)

**Abstract** In Brazil, the generation of 78 million tons of waste annually occurs, 35.2% of municipalities dispose of it improperly, resulting in environmental risks and health. In socially disadvantaged regions, this problem intensifies, and it is opportune to take actions that can increase reuse / recycling and rational consumption. Thus, the present study aimed to carry out interventions, with this theme, in public schools of a Brazilian city. The interventions (lectures, talk wheels and workshops) approached rational consumption, waste classifications and recycling as central axes. 150 students were involved in the suggested activities, in which they have intense participation, developing dozens of products from recyclable materials, such as toys, educational games and objects holder. In this way, it was possible to conclude that these actions are relevant, in order to contribute to the appropriation of the contents by the students and their change of behavior as transforming agents of society, mitigating the problems associated with solid urban waste in their communities.

**Keywords:** *Northeast Brazil, sustainability, waste, recycling*

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## 1. Introduction

The modern society produces a wide variety of waste daily, influenced mainly by the industrialization and unbridled consumption of goods and services. This can lead to social, economic and environmental problems, such as: soil pollution and aquifer sources; Damage to human health; Atmospheric and visual pollution; Vector proliferation (insects and rodents); Devaluation of real estate near the dump and generation of odors [1,2,3,4].

These problems can be intensified, compromising the quality of life of the citizens of a region, to the detriment of the type of waste management, especially in developing countries, where there are failures in this topic. [5] In Brazil, waste production is estimated at 78 million tons/year, with a per capita average of 1,062 kg/inhab/day. Selective collection initiatives are not observed in 35.2% of Brazilian municipalities. The final destination, in turn, is inadequately performed in 41.6% of the municipalities. Regarding the costs, there is an average expenditure of R\$ 119.76 per inhabitant/year in urban cleaning services [11,12,13].

In the State of Rio Grande do Norte (RN), the daily generation of waste is estimated at 2,657 tons

(0.780 Kg/inhab/day), 34% of this amount being discarded in dumps. Relative to the average gravimetric composition of urban waste samples is divided into: 37.57% wastage, 37.49% organic matter, 8.70% plastic film, 4.95% paper / cardboard, 4.39% hard plastic, 1.37% ferrous metals, 1.0% glass, other components 4.53%. The components with potential to be recycled are estimated at 20.41% [11,12].

The study was carried out in Santa Cruz / RN (38,000 inhabitants). Similar to other small localities, there are problems with solid waste due to poor collection equipment, low capacity of the executing team, and lack of recycling and conscious consumption programs. The production of waste in this locality is estimated at 22 tons per day (0.6 kg / inhab / day), of which 22% is recyclable. The average gravimetric composition of this waste is divided into: 29.31% tailings, 40.8% organic matter, 8.62% plastic film, 4.95% paper / cardboard, 4.60% hard plastic, 2.87% metals Ferrous, 1,7% glass, other components 7,15% [12,13].

## 2. Methodology

The present study was carried out in two public schools, in the municipality of Santa Cruz / RN / Brazil, for

elementary students II, involving interventions (lectures, talk wheels and workshops), whose main axes were: rational consumption, classification of residues and recycling.

Approximately 150 students were enrolled in the two schools, aged between 14 and 16 years. Initially, lectures were given on the classification of waste, types of reuse and recycling, as well as the risks to the environment.

Next, the wheels of conversations took place, where some questions were directed to the students, as well as reports of experiences, so that it was possible to understand the degree of their knowledge on this subject, and finally, the idea was proposed to assemble a Workshop for the making of objects and toys made with recyclable material, that this would be practiced in the second meeting.

In a second moment, the wheels of conversations were realized, including questionings and reports of experiences, so that one could understand the degree of knowledge of the students on the subject. Finally, it was proposed to carry out a workshop for the making of objects and toys made with recyclable material. In the workshop on the use of recyclable materials (cardboard, bottle pet, cans, among others), students were encouraged to produce toys, educational games and object holders, under the guidance of tutors.

### 3. Results and Discussions

The interventions sought to sensitize students to the importance of changing habits about compulsive consumption and solid waste. Initially, a focus was taken on speeches and conversation wheels (Figure 1), in a playful and clear way, with cartoons and photos being inserted that stimulated participants' reflection.



Figure 1. Conversation wheels and speeches

The discussions with students in the classroom stimulated the interest of the group in this theme, being questioned the consequences of uncontrolled consumption and the increasing production of waste in Brazil and in Santa Cruz / RN. The production of waste in this locality is estimated at 22 tons per day (0.6 kg / inhab / day), was not perceptible by students. Fact that generate costs of R \$ 119.00 per inhabitant per year [11,12].

One way to mitigate these annual expenses, in the order of R \$ 4,522,000.00, would be the reduction in waste generation and reuse, and it is opportune to demonstrate to

the students possible reuse and stimulation of creativity to produce various items (Figure 2).



A



B

Figure 2. Workshop on the production of objects from recyclable materials

These interactive workshops were important for the theoretical foundation and stimulated the creativity of the target audience. They demonstrate potential in creating interesting objects and helping to reduce waste problems. They were made of board games, pencil holder, jewelry box, safes, toys, bracelets and educational games [7,8,9,10].

In numerical terms, recycling stimulated with the local population, would allow a reduction of up to 4.8 tons of waste generated daily, in addition to an annual savings of R \$ 994,840.00. Thus, noticeable environmental and financial gains for the community [13].

Thus, it is important to stimulate selective collection and recycling, especially among schoolchildren, in order to discard in small children attitudes that lead to environmental improvement. In addition, financial collection may be possible with the sale of recyclable material [14,15].

This process of awareness in the school community can foster initiatives that transcend the school environment, generating potential multipliers of activities related to recycling, selective collection and conscious consumption [15].

### 4. Final Considerations

The city of Santa Cruz / RN presents problems with solid waste, similar to other developing regions, a fact that justifies the reinforcement of actions aimed at selective collection, recycling and rational consumption. Thus,

schools are important areas, since potential multipliers of activities related to this theme can be formed, and propagate actions that reduce the generation of waste and increase the reuse of these. It is possible to reduce public cleaning costs, increase collection through trade in recyclable material and stimulate students' creativity in the production of objects from recyclable material, and thus raise environmental awareness.

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