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SUSTAINABLE LEARNING: THE USE OF ECOBAGS AS AN ACTIVE STRATEGY FOR ENVIRONMENTAL EDUCATION IN ELEMENTARY SCHOOL

APRENDIZAGEM SUSTENTÁVEL: O USO DE ECOBAGS COMO ESTRATÉGIA ATIVA PARA EDUCAÇÃO AMBIENTAL NO ENSINO FUNDAMENTAL

APRENDIZAJE SOSTENIBLE: EL USO DE ECOBOLSAS COMO ESTRATEGIA ACTIVA PARA LA EDUCACIÓN AMBIENTAL EN EDUCACIÓN PRIMARIA

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Abstract: This study adopts an action research approach, combined with a bibliographical survey, to analyze the use of ecobags, which are reusable bags, in the Elementary School Science discipline, with a focus on promoting environmental education and sustainable practices. Using a methodological approach based on the analysis of scientific articles and educational reports, the study examines how the integration of ecobags into school activities can raise students' awareness of environmental issues. The results indicate that such practices favor the development of procedural and attitudinal skills, in addition to strengthening students' commitment to sustainability. We conclude that the use of ecobags is an effective teaching tool to increase environmental awareness and monitor pedagogical practice in line with contemporary demands for teaching that is more engaged with environmental preservation.

Keywords: Eco-bags; Environmental Education; Elementary Education; Inclusion of sustainable practices.

Resumo: Este estudo adota a abordagem da pesquisa-ação, articulada a um levantamento bibliográfico, para analisar o uso de ecobags, que se tratam de sacolas reutilizáveis na disciplina

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de Ciências do Ensino Fundamental, com foco na promoção da educação ambiental e práticas sustentáveis. Utilizando abordagem metodológica baseada na análise de artigos científicos e relatórios educacionais, o estudo examina como a integração de ecobags em atividades escolares pode sensibilizar estudantes para questões ambientais. Os resultados apontam que tais práticas favorecem o desenvolvimento de habilidades procedimentais e atitudinais, além de fortalecerem o compromisso dos discentes com a sustentabilidade. Concluímos que o uso de ecobags é uma ferramenta didática eficaz para ampliar a conscientização ambiental e monitorar a prática pedagógica às demandas contemporâneas por um ensino mais engajado com a preservação ambiental.

Palavras-chave: Ecobags; Educação Ambiental; Ensino fundamental; Inclusão de práticas sustentáveis.

Resumen: La ovinocultura es una actividad agropecuaria estratégica para el desarrollo sostenible, especialmente en regiones con aptitud para la producción animal y disponibilidad de recursos forrajeros. Sin embargo, el desempeño productivo de los rebaños ovinos todavía se ve limitado por la falta de difusión de tecnologías, manejo inadecuado y baja capacitación técnica de los productores. En este contexto, el presente trabajo presenta los resultados e impactos del 'Día de Campo – Sistemas, Técnicas y Manejos que, Cuando se Aplican Correctamente, Impactan la Productividad en la Ovinocultura', realizado durante la Expoagro 2025 en Dourados (MS), como una acción extensionista de la Universidad Federal de la Grande Dourados (UFGD) en colaboración con el Servicio Nacional de Aprendizaje Rural del estado de Mato Grosso do Sul (SENAR-MS) y el Instituto Federal de Mato Grosso do Sul (IFMS). El evento tuvo como objetivo promover la integración entre enseñanza, investigación y extensión, acercando el conocimiento científico a la realidad productiva local y difundiendo prácticas sostenibles e innovadoras orientadas a la eficiencia de la cadena de producción ovina. La metodología consistió en circuitos temáticos y demostraciones prácticas en cuatro estaciones técnicas: cerca eléctrica, uso de forrajes conservados, estación de monta y creep-feeding. Participaron 154 personas, entre productores, técnicos y estudiantes. Los resultados indican un notable compromiso de los participantes, fortalecimiento de las redes de cooperación y una creciente adopción de las prácticas sostenibles presentadas. Así, el día de campo se mostró como una herramienta eficaz de difusión tecnológica y capacitación técnica, impulsando el desarrollo sostenible y la consolidación de la identidad productiva de la ovinocultura regional.

Palabras clave: Bolsas ecológicas; Educación ambiental; Educación primaria; Inclusión de prácticas sostenibles.

INTRODUCTION

At the beginning of the 20th century, new types of materials known as plastics emerged, which became widely used in the manufacture of various objects (PIATTI; RODRIGUES, 2005). The word "plastic" originates from the Greek *plastics*, which means "suitable for being molded or shaped". According to the Polymer Dictionary (CANGEMI, 2005), the term plastic refers to "macromolecular materials that can be molded by means of heat and/or pressure". This versatility of plastics has generated significant transformations in consumption and, consequently, in people's lifestyles (PIATTI; RODRIGUES, 2005).

Plastic emerged as an alternative to replace various raw materials used by humans for

thousands of years, such as glass, wood, cellulose, metals, and materials of animal origin, such as leather, wool, and ivory. This substitution allowed access to consumer goods for low-income populations, making plastic a material widely present in everyday life since the 1940s (SALDANHA, 2011). This change altered the form and structure of the objects with which humans were accustomed to interacting daily.

The mass production of plastic bags, especially those made from Low-Density Polyethylene (LDPE), constitutes one of the greatest environmental challenges today. In Brazil, an average of 210,000 tons of this material are produced annually, equivalent to 9.7% of all waste generated in the country (FABRO et al., 2007). According to Viana (2010), estimates indicate that global consumption of plastic bags may reach approximately one million units per minute, totaling approximately 1.5 billion per day or more than 500 billion per year. According to Viana (2010), the average consumption of plastics in Brazil is 19 kg per inhabitant per year, while in the United States and Europe these values reach approximately 100 kg and 70 kg per inhabitant, respectively.

Given this worrying scenario, ecobags emerged as a promising alternative to reduce the environmental impact of plastic. Popularized at the end of the 20th century, mainly due to the support of environmental movements and celebrities. In Brazil, they began to be widely disseminated by sustainable initiatives in the fashion industry in the early 2000s, such as the "I am not made of plastic" exhibition, which consolidated the use of these bags in everyday life (Mega Curioso, 2024).

Each reusable bag can replace up to three disposable plastic bags over its lifespan, which represents a significant reduction in plastic consumption. However, to ensure its positive impact, it is necessary to use it consistently, minimizing the resources needed for its manufacture, such as recycled cotton and reused materials (Positiva Eco, 2024).

Currently, the planet faces an environmental crisis that goes beyond ecological issues, also being a crisis of understanding, mainly caused by a lack of knowledge (LEFF, 2012). This situation, related to environmental problems, can be addressed within the national curriculum parameters, where the theme of the Environment should be treated in a cross-cutting manner, integrating all subjects and grades of basic education.

The growing concern with environmental issues and sustainability has led to a search for pedagogical alternatives that promote environmental awareness from the earliest years of schooling. In this context, the use of ecobags as an educational tool in science teaching stands out, not only as a sustainable practice, but also as a means of integrating contemporary themes into the school curriculum (LEFF, 2012).

In the educational context, sustainability has become an increasingly present theme in school curricula, with the aim of forming critical citizens aware of their environmental responsibilities. The subject of science, especially in elementary school, plays a crucial role in this process, allowing students to understand the importance of sustainable practices for the future of the planet (COSTA et al., 2020).

From this perspective, the use of ecobags in educational activities can not only reinforce concepts of environmental preservation, but also stimulate reflection on responsible consumption and waste reduction (SILVA AND PEREIRA, 2022). Environmental education in schools is fundamental to promoting the necessary changes in each context in which we live. This process provides the individual with a comprehensive understanding of the environment around them, encouraging involvement both with themselves and with others, and revealing the details and aspects related to the biotic and abiotic environments that surround them (BARBOZA et al., 2016).

Beyond their environmental impact, ecobags play an important social role. Community projects in Brazil, such as the production of ecobags by women in vulnerable situations, promote social inclusion and sustainable development, reinforcing the importance of integrating these practices into school curricula to create more conscious citizens (Positiva Eco, 2024). The relevance of this study lies in exploring the role of ecobags not only as an educational tool, but also as a means of encouraging behavioral changes in relation to the environment from the early years of basic education.

From this perspective, this work aims to carry out a systematic mapping of the use of ecobags in science education in elementary school, with the objective of identifying how this practice can be effectively implemented in the classroom, integrating sustainable themes into the school curriculum and evaluating its effectiveness in promoting environmental awareness among elementary school students.

In this context, the present work aims to carry out a systematic mapping of the use of ecobags in science education in elementary school. It seeks to identify how this practice can be effectively implemented in the classroom, promoting the integration of sustainability-related themes into the school curriculum and evaluating its potential in developing students' environmental awareness.

THEORETICAL FOUNDATION

Replacing plastic has become one of the main challenges of modern society, given its ubiquitous presence in packaging and utensils, from the most basic to the most superfluous. The

growing concern about the environmental impacts of this material highlights the need for urgent measures to reduce its use.

Among these measures, the need to rethink consumption patterns and encourage the development of technologies that produce sustainable materials with characteristics similar to plastic, but which cause less damage to the environment, stands out.

In this context, the implementation of ecobags as sustainable alternatives gains relevance, especially in the educational environment, where science education can play a key role in raising awareness about responsible consumption and sustainability.

The use of reusable shopping bags, together with environmental education, can be an effective strategy to encourage more ecological practices and promote critical reflection on the impact of plastic use from the earliest school years.

Krasilchik (1987, p. 5) states that “reviewing the history of proposals for changes regarding science education over the last thirty-five years serves a dual purpose: to analyze some of the transformations in the school curriculum and to relate these changes to the role assigned to scientific disciplines in the education of students.”

Learning is most effective when students are motivated and eager to acquire new knowledge. For this to happen, it is essential that the learning process be enjoyable and spark the student's interest. In this sense, the activities proposed by the teacher should be directly connected to the students' daily lives and prior experiences, facilitating the understanding and application of concepts developed in the classroom. This link between theory and practice is essential to engage students and make learning meaningful and relevant.

> Thus, knowledge originates in the social practice of men and in the processes of transformation of nature forged by them. (...). By acting upon reality, men modify it, but in a dialectical relationship, this practice produces effects on men, changing both their thinking and their practice (Corazza, 1991, p. 84).

According to ABRIL (2024), "annually, between 500 billion and 1 trillion plastic bags are used worldwide. In Brazil, consumption reaches approximately 41 million bags per day, totaling approximately 15 billion per year." These data reinforce the importance of sustainable alternatives, such as the use of ecobags, to mitigate the environmental impact caused by the excessive consumption of disposable plastics.

Currently, the market offers a wide variety of eco-bags with diverse textures, prints, and designs. They can be made from cotton, recycled PET bottles, straw, synthetic fabrics, and canvas, with some designed by renowned stylists, which increases their value. Companies

benefit by printing their brands on these bags, promoting themselves as sustainable. However, there is still a long way to go to achieve complete awareness, as people are gradually adopting a more sustainable lifestyle, but the process is still developing.

2.2 Teaching sequence

According to Jacobi (2003, p. 196), "Environmental Education points to pedagogical proposals centered on awareness, behavioral changes, skills development, evaluation capacity and student participation."

In this research, we used a didactic sequence and followed Jacobi's (2003) guidelines to address Environmental Education. Regarding this, Grippi (2006) emphasizes that the discussion of this topic should begin in schools. Thus, children in the process of schooling can learn from a very young age to conserve and become aware of the importance of natural resources and the environment for human life.

The authors, Strauch and Albuquerque (2008), emphasize that thinking about the environment has an intentionality, since reality is constructed and shaped by the way individuals historically produce life. Thus, the better we know it, the more possibilities there are for transformation through social practices.

Thus, the actions proposed in this research aim to raise students' awareness of the importance of the proper disposal of waste generated by society. The proposal is flexible and not mandatory, offering situations and suggestions that guide the educator in their pedagogical practice. In this way, it seeks to facilitate students' understanding of the natural world in which they live and the importance of their daily choices.

2.3 Formulation and resolution of problems in science education

Early childhood education plays a fundamental role in students' development, requiring didactic and pedagogical approaches that integrate diverse activities connected to children's daily lives. This proposal aims to encourage students to reflect on the need to replace plastic bags, taking into account the development of new technologies that minimize environmental impact.

Reducing the use of plastics is a contemporary challenge, given that many products still rely on plastic packaging. Therefore, it is urgent to rethink our consumption and seek alternatives that do not harm the planet.

In this context, it is essential that professionals involved in early childhood education commit to improving their methodologies, aiming for the holistic development of students.

Although the theme of sustainability is present in schools, the teaching options available to teachers, especially in the early years, are limited.

Therefore, it becomes necessary to explore viable and meaningful teaching alternatives. Teaching science requires educators to adopt diverse methodologies and approaches that are appropriate to the students' age group, in order to spark their interest and motivation in the field.

3. METHODOLOGY

This study is characterized as action research, of a qualitative nature, articulated with a systematic mapping-type bibliographic survey. This approach was chosen because it allows for the combination of investigation and pedagogical practice, promoting reflections based on a concrete classroom experience.

In the first stage, a systematic mapping was conducted in scientific databases (Google Scholar, Scopus, SciELO, and CAPES) in order to identify research that discusses the use of ecobags in the educational context. The analysis included inclusion and exclusion criteria, as detailed in Table 1.

In the second stage, the action research was developed with 5th grade classes of Elementary School I at Colégio e Curso Almirante Tamandaré (CCAT), in Campo Grande/MS. Four 50-minute classes were held, structured in stages that involved: (i) surveying students' prior knowledge about the environment and conscious consumption; (ii) lecture on recycling and proper waste disposal; (iii) making ecobags from used t-shirts; (iv) assessment of acquired knowledge and collective reflection.

Throughout the process, the students actively participated as protagonists of their learning, reinforcing the nature of action research, which combines practical intervention and continuous reflection on the reality being investigated.

Evaluation Criteria: Learning outcomes were analyzed using (a) comparison between prior and final knowledge obtained in interactive activities; (b) observation of engagement and participation in workshops; (c) visual records of the ecobag making process; and (d) spontaneous student accounts of the experience. These instruments allowed us to verify conceptual and attitudinal advances related to sustainability.

To conduct the literature review and identify the main contributions related to the article's topic, a systematic mapping *study was carried out,* following a structured methodology. This approach involves searching for and selecting relevant studies in scientific databases, using logical operators and specific keywords.

The databases considered for the development of this work were Google Scholar, Scopus, SciELO, and the CAPES (Coordination for the Improvement of Higher Education Personnel) Periodicals Portal. These platforms were chosen because they offer access to a wide range of scientific articles, indexed journals, and relevant academic works, allowing for a comprehensive and well-founded bibliographic survey.

In this study, we opted for a systematic mapping approach to explore the use of ecobags as sustainable alternatives in the Science discipline. The use of *software* Mendeley was instrumental in organizing the information and facilitating access to bibliographic references. According to Santos and Lima (2021), "systematic mapping is an effective strategy for reviewing existing literature, allowing the identification of gaps and research opportunities," we present a detailed description of the process of searching, screening, and analyzing the collected information.

The first step involved a careful search of academic databases, where we used keywords such as "ecobags," "environmental education," "sustainability," and "science education." The choice of these words reflects the intention to encompass the intersection between pedagogical practices and environmental awareness. As Costa et al. (2020) emphasize, "environmental education is a powerful tool for shaping students' critical awareness of environmental issues." Thus, we sought articles that not only described the use of ecobags but also discussed their educational implications.

After the initial collection, the references were imported into Mendeley, where we began screening based on inclusion and exclusion criteria. These criteria were formulated to ensure that the selected articles were relevant and recent. Specifically, we considered:

Table 1: Inclusion and exclusion criteria for articles

Criterion	**Inclusion**	**Exclusion**
Reading the titles	Based on an analysis of the titles, prioritizing those that were directly related to the objectives of the work.	Duplicate titles across databases were removed to avoid redundancy.
Language	Portuguese	English
Central theme	Studies that address the use of ecobags in an educational context,	Studies that do not address the use of reusable

	especially in science education.	shopping bags or sustainable education.
Methodology	Empirical research, systematic reviews, or case studies.	Opinion pieces, editorials, essays, or materials lacking empirical basis.
Availability of access	Articles that are open access or available in academic databases.	Items that are inaccessible or cannot be purchased.
Years	Articles published between 2018 and 2024.	Articles published before 2018.

Source: Author's own work (2024)

We focused on studies that directly addressed the use of reusable shopping bags in educational settings, reflecting the importance of integrating sustainable practices into the school curriculum. In this initial phase, we analyzed titles and abstracts to identify articles that aligned with the established criteria. This step allowed us to quickly discard references that did not fit the proposed theme.

The data extracted from the articles were organized into categories that allowed us a clear and structured analysis of the information. The categories were defined based on fundamental aspects that emerged during the reading of the texts.

In Educational Methodology, this category encompasses the strategies used to implement the use of ecobags in classrooms. Almeida and Santos (2021) emphasize that "the integration of sustainable practices in education is crucial for forming conscious and responsible citizens."

We focused on studies that directly addressed the use of reusable shopping bags in educational settings, reflecting the importance of integrating sustainable practices into the school curriculum. In this initial phase, we analyzed titles and abstracts to identify articles that aligned with the established criteria. This step allowed us to quickly discard references that did not fit the proposed theme.

We believe that this systematic approach will provide valuable insights for educational practice and for promoting a culture of sustainability in schools.

RESULTADOS E DISCUSSÃO

After conducting systematic searches in the selected databases, the results were

organized and systematized into tables and graphs, with the aim of presenting the information in a clear and accessible way. The systematic mapping included the analysis of four articles that explore different aspects of environmental education and sustainable practices.

Table 1 presents the analyzed studies that indicate that, although there is a growing understanding of the importance of environmental education, significant barriers to the adoption of sustainable practices still exist. Many participants have basic knowledge of topics such as solid waste and selective collection, but do not transfer this knowledge to practical actions, such as separating waste in their homes.

Table 2: Information from Selected Studies

Article	**Main Theme**	**Objective**	**Methodology**	**Main Results**
Production, consumption and disposal of plastic waste (UERN)	Environmental impacts of plastic bag consumption.	To identify students' perceptions regarding the production, consumption, and disposal of plastic bags.	Semi-structured questionnaires; quantitative analysis with graphs generated in Excel.	56.25% are unaware of the raw material used in plastic; low adoption of reusable shopping bags.
Environmental education and solid waste (Tapauá-AM)	Environmental education and the perception of solid waste in high school.	To understand students' relationship with the environment and promote awareness through ABE (Environmental Education).	Questionnaires, debates, a visit to the "dump," and active methodologies (Team-Based Learning).	90% of students do not practice selective waste collection; active learning methodologies have increased environmental awareness.
EcoRetalhos: Reusing textile and plastic waste.	Production and promotion of the use of eco-bags made from textile waste.	To promote sustainable practices and raise awareness about consumerism and the disposal of plastic waste.	Production of ecobags using textile waste; semi-structured questionnaires and practical workshops.	70% understand the importance of reusable bags, but do not use them due to lack of habit and convenience.
Consumption and use of plastic bags in the Federal District, Brazil.	The alarming production of plastic in the country and the environmental impacts caused by the excessive use of plastic bags.	To observe the socioeconomic and cultural aspects of plastic bag use and to identify environmental policies and consumption practices.	Bibliographic research and field research with 66 interviewees and a questionnaire applied to residents of the Federal District.	More than 50% of those surveyed are unwilling to pay for biodegradable bags; 33% dispose of solid waste daily.

Source: Author's own work (2024)

Active methodologies, such as Team-Based Learning (TBL), have demonstrated great potential for engaging students, raising environmental awareness, and encouraging more responsible attitudes.

Although widely recognized as sustainable alternatives, ecobags face challenges such as the absence of habitual use among users and the convenience of traditional practices.

Figure 1 shows the percentage of different perceptions and sustainable practices among the audiences of the four mapped articles.

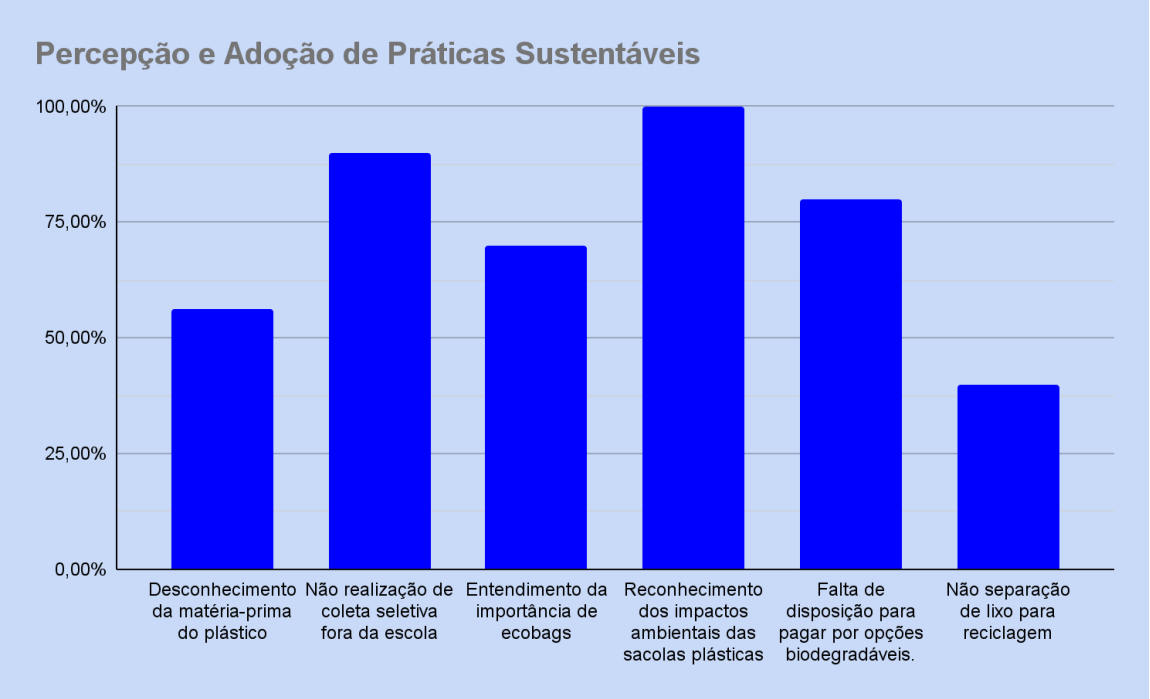

Figure 1. Percentage of different perceptions and sustainable practices among the audiences of the four articles.

Source: Author's own work (2024)

Figure 1, entitled 'Perception and Adoption of Sustainable Practices,' provides an overview of how participants perceive and adopt sustainable practices. This graph, resulting from the analysis of four mapped articles, illustrates the discrepancy between environmental awareness and the implementation of practical actions in daily life.

Although a significant percentage of participants recognize the negative impacts of plastic bags and demonstrate a basic understanding of the importance of sustainability, the adoption of effective practices, such as selective collection and waste separation, remains low. This situation highlights the need for more robust educational interventions that encourage the

practice of sustainable habits.

Furthermore, the graph presents an overview of behaviors and knowledge related to sustainability. It shows that the highest percentage is attributed to the recognition of the environmental impacts of plastic bags, but this awareness does not translate into practical actions. Effective practices, such as selective waste collection outside of school and separating waste for recycling, show low percentages, highlighting the need for greater incentives and environmental education.

Other factors, such as a lack of knowledge about the raw materials used in plastics and an unwillingness to pay for biodegradable options, also demonstrate significant challenges to the adoption of sustainable habits.

REPORT ON EDUCATIONAL PRACTICES IN SCIENCE IN ELEMENTARY EDUCATION

In November 2024, a hands-on activity to make ecobags was carried out with the 5th grade classes of Elementary School I. The proposal aimed to stimulate awareness about sustainability, reuse of materials and conscious consumption. Each student brought a used t-shirt from home, which was transformed into a reusable bag.

The activity was divided into four stages, integrating theory and practice: (i) review of students' prior knowledge and discussion about conscious consumption; (ii) lecture “Recycling Our Attitudes”, given by the company SOLURB Soluções Ambientais; (iii) workshop on making ecobags; (iv) final assessment, in which students answered interactive questions and reflected on what they had learned.

The analysis of the results demonstrated that the students not only understood the importance of replacing plastic bags with reusable bags, but also engaged in building practical solutions to the environmental problem. The interdisciplinary nature of the activity fostered integration between Science, Sustainability, and Citizenship.

This activity was developed with 5th-grade classes, aiming to lead students to reflect on the need to replace plastic bags with reusable bags. The main focus was to promote knowledge construction, allowing students to create, think, and explore different forms of learning through a hands-on activity with social and environmental significance. By seeking solutions to the problem of excess plastic waste, students were able to connect school content with everyday reality, becoming protagonists in the educational process through experimentation and creativity.

Colégio e Curso Almirante Tamandaré (CCAT) is a private educational institution located in Campo Grande, the capital of the state of Mato Grosso do Sul. Founded in 2002, the school has established itself as a benchmark in basic education in the region, offering a traditional pedagogical approach focused on the holistic development of its students. The school serves students from preschool through high school, and also maintains a preparatory course for admission to the Military College.

Step 1: Review students' everyday knowledge of environmental education and introduce basic concepts about reusable bags, sustainability, and conscious consumption.

This stage was carried out in a 50-minute class, in which students were able to relate the use of plastic bags to the problems arising from excessive consumption and propose alternatives for more conscious consumption, promoting habits of reduction.

2nd Stage: Lecture entitled "Recycling Our Attitudes", promoted by the company SOLURB [2]Soluções Ambientais (Figure 2). This activity, also lasting 50 minutes, took place in the schoolyard and addressed topics such as the correct disposal of solid waste, selective collection, and the benefits of recycling. The lecture highlighted the importance of proper waste disposal, such as sanitary landfills and sorting plants, as well as the impact of waste on environmental degradation. It was an enriching moment that emphasized building a more sustainable future.

Figure 2. Pedagogical activities for sustainable learning.

[2] SOLURB – Environmental Solutions is the company responsible for the collection, transportation, and disposal of urban solid waste in Campo Grande – MS. In addition to its operational services, the company develops educational initiatives focused on environmental awareness, promoting lectures, technical visits, and playful activities in schools. These initiatives are educational and critical in nature, as they encourage students to reflect on conscious consumption, the correct separation of waste, and the impact of waste on the environment, strengthening the role of environmental education as a transformative agent in society.

Step 3: Identify the importance of sustainable actions and value new uses for the same product. Using old t-shirts brought by the students, we made eco-bags, as can be seen in Figures 3 and 4, aiming to raise awareness about socio-environmental responsibility, minimizing the environmental impacts generated by the use and disposal of plastic bags. The morning was full of learning and motivation to adopt sustainable practices.

Figure 3. Making ecobags.

Figure 4. Making ecobags.

Step 4: Assess the knowledge acquired by the students. To do this, we applied a sequence of interactive questions that compared the students' prior knowledge, evidenced in the first lesson, with the knowledge acquired throughout the proposal and demonstrated in the last lesson. This approach allowed us to verify the didactic evolution in relation to the content taught.

The activities were carried out over four classes, each lasting 50 minutes. In the initial

activities, we sought to verify, understand, and differentiate the students' prior knowledge in a simple way, through the investigation of problems. Even without specific knowledge, students were encouraged to propose solutions, with the teacher clarifying, when necessary, their prior knowledge about the activity.

In the following stages, by problematizing content, formulating hypotheses, preparing and conducting experiments, collecting data, and analyzing results, the students felt motivated and encouraged to explore, compare results, and thus promote conceptual changes that improved their daily lives.

CONCLUSION

Therefore, the data analysis reveals a clear discrepancy between environmental awareness and the adoption of sustainable practices among the study participants. Although many recognize the negative impacts of plastic bags and demonstrate a basic understanding of the importance of sustainability, the implementation of practical actions, such as selective collection and waste separation, is still unsatisfactory. This situation highlights the urgency of educational interventions that not only inform but also motivate individuals to transform their knowledge into concrete actions.

As we discuss the importance of environmental education and the need for sustainable practices, it is crucial to consider the global context in which these issues are being debated. COP 30, which will take place in the Amazon, represents a significant milestone in discussions on climate change and sustainable development. This event will bring together world leaders, experts, and representatives of civil society to discuss strategies and concrete actions aimed at mitigating the impacts of climate change, protecting biodiversity, and promoting social justice.

In short, environmental education is crucial for forming conscious and responsible citizens. COP 30 highlights the importance of environmental preservation and global collaboration to face the challenges.

Interventions should be aimed at raising awareness about the raw materials of plastic and promoting a willingness to adopt sustainable alternatives, such as reusable bags and biodegradable products. Furthermore, it is essential that public policies encourage environmental education in schools and communities, creating an environment conducive to the practice of sustainable habits.

Only through effective interventions will it be possible to promote a significant change in society's behavior regarding consumption and waste disposal, thus contributing to the preservation of the environment and the construction of a more sustainable future.

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