

# MENDIVE



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## Original article

### Environmental education and solid waste management at the José Faustino Sánchez Carrión Trujillo Educational Institution

**Educación ambiental y manejo  
de residuos sólidos en la  
Institución Educativa José  
Faustino Sánchez Carrión  
Trujillo**

**Educação ambiental e gestão  
de resíduos sólidos na  
Instituição Educacional José  
Faustino Sánchez Carrión  
Trujillo**

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## ABSTRACT

Environmental education has a fundamental mission in the formative process of the person, either in school spaces or in informal education spaces, based on the UNESCO declaration in order to contribute to a sustainable world. By particularizing the above to the context of research development in Peru and singularly in an educational institution in Trujillo, the determination of the relationship between environmental education and solid waste management in the Institution is determined as the objective of the research. José Faustino Sánchez Carrión School in the city of Trujillo in the department of La Libertad in Peru. For the development of the research, the quantitative approach was applied, with a descriptive experimental design. The sample selection consisted of 240 students who were questioned through a questionnaire on solid waste management, taking into account high levels of reliability and validity. The main results made it possible to determine that environmental education is perceived by students as fairly adequate, while solid waste management presents an inadequate response. A level of success of 0.5% and failure of 0.5% was taken into consideration for the results. This allowed us to conclude that there is a significant and direct relationship between environmental education and solid waste management.

**Keywords:** sustainable development; environmental education; waste; sustainability.

## RESUMEN

La educación ambiental tiene una misión fundamental en el proceso formativo de la persona, ya sea en los espacios escolarizados como en los espacios de educación informal, a partir de la declaración de la UNESCO en función de contribuir a un mundo sostenible. Al particularizar lo anterior al contexto de desarrollo de la investigación en Perú y de manera singular en una institución educativa de Trujillo, El objetivo de la

investigación estuvo en determinar de la relación existente entre la educación ambiental y el manejo de residuos sólidos en la Institución Educativa José Faustino Sánchez Carrión de la ciudad de Trujillo del departamento de la Libertad en Perú. Para el desarrollo de la investigación se aplicó el enfoque cuantitativo, con diseño experimental descriptivo. La selección muestral estuvo formada por 240 estudiantes que se interrogaron a través de un cuestionario sobre el manejo de residuos sólidos, teniendo en consideración altos niveles de confiabilidad y validez. Los principales resultados permitieron determinar que la educación ambiental es percibida por los estudiantes de forma medianamente adecuada, mientras que el manejo de residuos sólidos presenta una respuesta poco adecuada. Se tuvo en consideración para los resultados un nivel de éxito de 0.5% y de fracaso 0.5%. Lo anterior permitió concluir que existe una relación significativa y directa entre la educación ambiental y el manejo de residuos sólidos.

**Palabras clave:** desarrollo sostenible; educación ambiental; residuos; sostenibilidad.

## RESUMO

A educação ambiental tem uma missão fundamental no processo educativo da pessoa, seja nos espaços escolares, seja nos espaços informais de educação, assente na declaração da UNESCO em termos de contribuir para um mundo sustentável. Ao particularizar o exposto ao contexto de desenvolvimento da pesquisa no Peru e de forma única em uma instituição de ensino em Trujillo, o objetivo da pesquisa foi determinar a relação existente entre a educação ambiental e a gestão de resíduos sólidos na Instituição Educacional José Faustino Sánchez Carrión da cidade de Trujillo, no departamento de La Libertad, no Peru. Para desenvolver a pesquisa foi aplicada a abordagem quantitativa, com delineamento experimental descriptivo. A seleção da amostra foi composta por 240 estudantes

que foram questionados por meio de questionário sobre gestão de resíduos sólidos, levando em consideração altos níveis de confiabilidade e validade. Os principais resultados permitiram constatar que a educação ambiental é percebida pelos alunos de forma moderadamente adequada, enquanto a gestão de resíduos sólidos apresenta uma resposta menos que adequada. Um nível de sucesso de 0,5% e um nível de falha de 0,5% foram levados em consideração para os resultados. O exposto permitiu concluir que existe uma relação significativa e direta entre a educação ambiental e a gestão de resíduos sólidos.

**Palavras-chave:** desenvolvimento sustentável; educação ambiental; resíduos; sustentabilidade.

## INTRODUCTION

Education as a right of all human beings is constituted as a universal declaration by the United Nations (UN) (UN General Assembly, 1948). Element that has been taken up repeatedly by researchers and international organizations, and that is taken up in the sustainable development objectives of the 2030 Agenda (Murga, 2018), specifically in objective # 4 aimed at Guaranteeing inclusive and equitable quality education and promote learning opportunities for all.

In this sense, environmental education is not immune to these dynamics, and in contemporary society, characterized by phenomena such as the globalization of knowledge and technological advances, we have brutally neglected the environment (Simões et al., 2019).

In this regard, the challenge that is consolidated at the international level is to develop an environmental education and culture that allows us to protect the planet and make it sustainable, an aspect that has

been recurring in the Earth summits and that was reaffirmed in Scotland 2021 (Zamora, 2021)

The theoretical approach to the topic has been discussed by various authors and is recognized as a common element in educational and environmental research, which highlights the importance of the topic for science (Pulido and Oliviera, 2018; Prosser and Romo, 2019; De la Peña and Vinces, 2020). Some authors such as (Tilbury, 2012; Azcárate et al., 2012) carry out studies on environmental education from the assumption of sustainability, others such as (Barrón et al., 2010) carry out an analysis from the perspective of teachers and the treatment that from the classroom it is offered, coinciding with a reductionist vision that emphasizes content about the environment and not how environmental education can transform the environment.

Authors such as Simões et al. (2019) refer to how environmental education is a process of multiple influences that not only refers to environmental aspects, but also has a direct influence from the economy, the context, the social and therefore the educational. The above was enhanced by the inclusion of environmental education in many curricula (Lopera et al., 2019) and the intention to solve environmental problems from the academy (Franco et al., 2018).

In relation to the above Miranda (2014):

Environmental problems are considered to constitute the basis for the development of environmental education in the teaching-learning process, since it is a function of their expression in the community, starting from the principle of thinking globally and acting locally, which The different activities at school must be planned, as well as linking the content of the subjects and achieving

the active participation of students in order to prevent or mitigate them (p. 4).

Other authors such as Pérez and Oviedo (2019) insist that addressing the problem must have a comprehensive response from all social actors (which include people and organizations) but where the school plays a fundamental role in that first approach of students to issues related to environmental care.

This has led other authors (Companioni and Benguría, 2017; Luis and Jiménez, 2019; Cruz et al., 2021) to investigate environmental education in close relationship with educational topics such as the improvement or training of teachers, development of culture environmental and the impact that occurs in society from the educational field.

When focusing on environmental education in order to promote social change, elements of awareness stand out through the process of environmental education in order to modify the behavior of students as a necessary element for sustainability (Pérez and Oviedo, 2019)

Thus, educational institutions are recognized as spaces with the responsibility of providing quality education to form good men, who are not only faithful exponents of the knowledge that has been transmitted to them but also put into practice the skills learned, but with high ethical values, with a strong attachment to environmental protection and that respond to international, national and local policies.

The idea that educational institutions become the space par excellence to promote sustainable development and social change was reaffirmed at the World Conference on Education for Sustainable Development (ESD) held from May 17 to 19, 2021. in Berlin, a space where the challenges of lifelong learning and its role in solving global problems and creating

more sustainable societies were debated. (Castro, 2021)

Declarations emerged from this meeting that constitute a guiding compass for environmental education, among them the following stand out:

We are convinced that urgent action is needed to address the dramatic interrelated challenges facing the world; in particular the climate crisis, the massive loss of biodiversity, pollution, pandemic diseases, extreme poverty and inequalities, violent conflicts and other environmental, social and economic crises that endanger life on our planet. We believe that the urgency of these challenges, exacerbated by the COVID-19 pandemic, requires a fundamental transformation that guides us towards sustainable development based on more just, inclusive, supportive and peaceful relationships between human beings and with nature. (UNESCO, 2021, p. 1).

In addition to this, there have been multiple investigations that have related environmental education and solid waste management in the school context, as well as the competencies or skills that are developed in students in this sense. (Robles et al, 2010; Márquez et al., 2021).

Among the main environmental problems that are recognized by the scientific community, pollution, climate change, deforestation and loss of biodiversity stand out, for which environmental education has become a strategic element to solve it (Herrera and Ríos, 2017; Nay and Cordero, 2019).

The Peruvian reality exhibits the existence of educational policies and plans that promote environmental education, from the initial level to the higher level, within them are the National Environmental Policy, the National Environmental Education Policy (PNEA) and the National Plan. of Environmental Education (PLANEA), whose purpose is to create environmental awareness and promote the practice of environmental behaviors (Estrada et al., 2020).

From the aforementioned educational plans and policies, the environmental approach emerges, a transversal strategy that seeks to promote environmental education and culture to train environmentally responsible people who contribute to sustainable development at the local, regional and national level (Ministry of Education, 2020). Its thematic components are related to education on climate change, education on eco-efficiency, health education and education on risks and disasters (Araoz et al, 2020).

However, even though it is an old problem that has had a strong development of associated research, the behavior of the members of the educational communities, where students excel, still does not demonstrate having or putting into practice quality environmental education that responds to the current problems within which the treatment of solid waste stands out.

Although it is considered that there is theoretical information in this regard, it is not enough to face the problem; it is necessary to contextualize it to real environmental situations. It can only provide theoretical information, since it is important, but not decisive, to apply this knowledge to real, everyday environmental problems. It is also important to point out that many officials and managers of parents' associations do not encourage the separation of waste and do not facilitate the logistics to carry it out; it must also be taken into account that waste reduction, recycling and reuse programs waste

developed by teachers is not sustainable, and that municipal waste management is inadequate, since garbage trucks do not always comply with established times.

Given this situation, it is necessary to first know how the Educational Institution "José Faustino Sánchez Carrión" inserts environmental education, how it manages its solid waste and if there is a significant relationship between both elements. This will allow teachers to redefine their strategies and methods to raise awareness and develop an environmental culture among members of the educational community that leads to sustainability, implement measures to reduce the generation of excessive waste and promote adequate classification, reduction, recycling, and reuse, thus contributing to the reduction of environmental pollution. The objective of the study is therefore to determine the relationship between environmental education and waste management at the IE José Faustino Sánchez Carrión, an educational institution in Trujillo, Peru.

## MATERIALS AND METHODS

The research had a quantitative approach since the collection and analysis of data was carried out using statistics to determine the behavior of the sample, the design was non-experimental since the study variable was not manipulated, but analyzed in its context and its type was descriptive, cross-sectional correlational since the properties and characteristics of the variables were analyzed, we sought to know if they were related; and data collection occurred at a single moment, respectively (De la Caridad, 2018).

The population was made up of a total of 550 students who were in the fourth and fifth grade of secondary education and who did not present any restrictive physical or psychological condition to participate in the research and the sample would be made up

of 240 students, whose number was determined through sampling. probabilistic. According to the sociodemographic data, fourth grade and fifth grade students participated, whose relationship to the ages of the students will be 14 years, 16 years, 17 years and 15 years.



**Fig. 1-** Location of the study area in the city of Trujillo. José Faustino Sánchez Carrión Education Institution, La Libertad Region, Peru.

**Table 1-** Sociodemographic characteristics of the students of the José Educational Institution. Faustino Sánchez Carrión from the city of Trujillo, department of La Libertad, Peru.

Variables		n= 240	%
Degree	Room	135	56.4
	Fifth	105	43.6
Age	14 years	83	34.4
	15 years	42	17.4
	16 years	66	27.7
	17 years	49	20.5
	Sex		
Male	Male	240	100
	Female	0	00.0

The data collection technique used was the survey, with questions concerning Environmental Education and Solid Waste Management. The Environmental Education Questionnaire consisted of 20 Likert-type items (always, almost always, sometimes, almost never and never) and evaluated 3 dimensions: cognitive (items 1-9), affective (items 10-15) and behavioral (items 16-20).

Regarding the Solid Waste Management Questionnaire, it was adapted for the purposes of this investigation. It had 15

Likert-type items (always, almost always, sometimes, almost never and never) and evaluated 4 dimensions: segregation (items 1-4), reduction (items 5-8), recycling (items 9-12) and reuse. (items 13-15).

The data collection process was carried out in June 2018. To do this, authorization from the director of the educational institution was previously requested and once obtained, the calculation of the number of sections was carried out, as well as the number of students to survey. Then, a letter was sent to the parents asking for their consent to authorize their children to participate in the research. Finally, the application of instruments was carried out collectively under the accompaniment of the researchers.

Descriptive analysis was used and in the inferential part the correlation test was used since the variables are qualitative. The statistic served to determine whether environmental education and solid waste management were significantly related or not.

## RESULTS

40.5% of the students perceived that environmental education is moderately adequate, 29.3% consider that it is adequate, 18.5% indicated that it is slightly adequate, 6.1% indicate that it is inadequate and 5% indicated that it is inadequate. .6% think it is very appropriate. According to the students' perception, teachers are characterized because there are limitations regarding the application of strategies and methodologies that allow them to apply the environmental approach to develop students' environmental awareness and promote sustainable development (Table 1).

On the other hand, 34.9% indicate that the solid waste management carried out in the educational institution is not very adequate, 25.1% indicate that it is moderately adequate, 19% specify that it

is adequate, 12.3 % mention that it is very appropriate and 8.7% consider that it is inadequate. The results presented indicate that the educational institution is not carrying out a correct segregation of solid waste nor is it promoting the practice of pro-environmental activities such as reduction, recycling, as well as the reuse of the waste generated there (Table 2).

From the previous quantitative results, it can be inferred that the reality in the EI "José Faustino Sánchez Carrión" corresponds to the theoretical analyzes carried out in other investigations, but above all it reveals that environmental education, even when there is recognition of its importance and certain proposals for its improvement, has gaps in its treatment, as a necessary transversal axis in education.

**Table 2-** Descriptive results of students' perception of environmental education and solid waste management

Categories	Environmental education		Solid waste management	
	n=240	%	n=240	%
Very suitable	twenty	5.6	33	12.3
Appropriate	66	29.3	46	19.0
Fairly adequate	88	40.5	58	25.1
Inappropriate	Four. Five	18.5	76	34.9
Inappropriate	twenty-one	6.1	26	8.7

## DISCUSSION

A first approach shows that students perceive that the environmental education provided by teachers is moderately adequate, which means that there are some limitations regarding the application of strategies and methodologies by teachers that cause teaching to focus in theoretical domains, classes are not always active or participatory, collective work is rarely encouraged, and students' research and creativity is sometimes left aside. This would be hindering the development of environmental awareness and the search for sustainable development in them, since

it contravenes the principles of effective environmental education, which must be focused on critical and reflective pedagogy, and, above all, must be given actively and experientially, thus promoting the solution of environmental problems that affect the immediate environment (Cortes et al., 2017; Mamani et al., 2020).

The results presented coincide with the findings reported by De la Caridad (2018), who found that the main difficulties are given by the low levels of interdisciplinarity, which do not promote continuous training in students regarding environmental education, which is also related with the inadequate preparation and attention of teachers, little promotion of the development of projects that allow them to have direct contact with nature and the formulation and execution of alternative solutions to the environmental problems of their environment were rarely encouraged. Likewise, it is consistent with the results found by Araoz et al (2020) who determined that students perceived that the environmental education they received was partially adequate, while the management of solid waste is not very appropriate. As can be seen, our results and those of the aforementioned background coincide in that, according to the students' perception, the environmental education provided by their teachers is moderately adequate, that is, there are aspects that must be improved to reach optimal levels.

The findings allowed us to conclude that there is a direct and significant relationship between environmental education and solid waste management. On the other hand, the existence of a direct and significant relationship between environmental education and the processes of segregation, reduction, recycling and reuse carried out by students was also determined. Finally, it was found that the environmental education provided by teachers is moderately adequate and the solid waste management carried out in the educational institution is not very adequate. Therefore, it is necessary to

strengthen the didactic and methodological capacities of teachers to improve environmental education and it would be important for the management team to promote the design and execution of integrated environmental educational projects and programs that promote the efficient management of solid waste among all members of the educational community.

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**Conflict of interests:**

The authors declare not to have any interest conflicts.

**Authors' contribution:**

The authors participated in the design, analysis of the documents and writing of the work.

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