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The reuse of solid waste to promote environmental

La reutilización de residuos sólidos para fomentar la conciencia ambiental

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Abstract

One of the global problems that concerns education is environmental pollution, which has a negative impact on society, regardless of whether it is a developed or underdeveloped country on the planet. Thus, knowing that life depends on the ecosystemic world, it is urgent to formulate and implement pedagogical strategies that guide students to respect and care for the environment, through ecological competencies leading to the formation of environmental awareness, taking into account the following research question: What are the benefits of reusing solid waste to raise awareness in the preservation and environmental protection in fifth grade students of the educational institution Cuenca San Marcos, Sucre? The main objective is to strengthen educational practices in the care and preservation of the environment through a playful pedagogical strategy in fifth grade students of the Cuenca San Marcos Educational Institution.

Key words: Reuse, solid waste, awareness, environment, 5Rs, pollution.

Resumen

Uno de los problemas globales que atañe a la educación es la contaminación ambiental que impacta negativamente a la sociedad independientemente si es un país desarrollado o subdesarrollado del planeta. Así, sabiendo que la vida depende del mundo ecosistémico, es urgente formular e implementar estrategias pedagógicas que orienten a los estudiantes al respeto y cuidado del medio ambiente, por medio de competencias ecológicas conducentes a la formación de la conciencia ambiental, teniendo en

cuenta la siguiente pregunta de investigación: ¿Qué beneficios aporta la reutilización de residuos sólidos para concienciar en la preservación y protección ambiental en estudiantes de quinto grado de la institución educativa Cuenca San Marcos, Sucre? Siendo el objetivo principal fortalecer las prácticas de educación en el cuidado y preservación del medio ambiente por medio de una estrategia lúdico pedagógica en estudiantes de quinto grado de la Institución Educativa Cuenca San Marcos.

Palabras clave: Reutilización, residuos sólidos, conciencia, ambiente, 5 erres, contaminación.

Introduction

One of the global problems that has a negative impact on humanity is environmental pollution, regardless of whether it is a developed or underdeveloped country on the planet. Thus, knowing that life depends on the eco-systemic world, hence the need to promote educational strategies to preserve the natural balance so that it is urgent to formulate and implement pedagogical strategies that guide students to respect and care for the environment, through ecological competencies leading to the formation of environmental awareness, it is here, where it becomes necessary to pose the following research question: What benefits does the reuse of solid waste to raise awareness in the preservation and environmental protection in fifth grade students of the educational institution Cuenca San Marcos, Sucre?

Therefore, and to find the appropriate response through the development of this article, which is based on the research project developed in the educational context, the general objective is to strengthen educational practices in the care and preservation of the environment through a playful-pedagogical strategy in fifth grade students of the Educational Institution Cuenca San Marcos, Sucre, guided by the following specific objectives, to diagnose the students' conceptions about the care and preservation of the environment, in particular the 5Rs and the reuse of solid waste, to design a ludic-pedagogic strategy to raise awareness about the preservation and care of the environment, to implement the ludic-pedagogic strategy with the participation of fifth grade students, and to evaluate the benefits of the ludic-pedagogic strategy with the students.

This is a situation in which the polluting problems are due in part to the poor management of solid waste, in all places, and this is a factor that affects the life of animals in the seas, rivers and wetlands, especially the Cuenca swamp, giving it the appearance of an open dump, It is also a breeding ground for mosquitoes, which translates into an unfavorable environmental impact on the health of the communities and the environment, therefore, environmental and educational institutions should promote educational projects aimed at the proper use of solid waste. This requires a methodological change reflected in the environment, so that the student from basic education is aware of the acts in relation to the

care and preservation of nature.

In this sense, within the context of the writing based on the development of the pedagogical project, it is circumscribed to action research, taking a sample of 10 boys and girls of fifth grade of elementary basic education of the Educational Institution Cuenca San Marcos, department of Sucre. In this educational institution the management of solid waste represents a transcendental problem, since the presence of solid waste is observed weekly everywhere, there are few waste bins distributed in the institution, smoke is filtered by the burning of garbage of all kinds of elements and bad odors. This directly affects the interaction environment of the students, disturbs the health of the inhabitants and pollutes the atmosphere, which favors the increase of global warming. On the other hand, in the institution, there is no awareness of this problem and there is a lack of campaigns that work to prevent the misuse of waste.

On the other hand, it is also part of the qualitative approach, which arises from the diagnosis exhibiting problems in the management of solid waste, exclusively in plastics and papers; in the vast majority of cases they are not classified for recycling or reuse, which is why this research proposal is based on the knowledge and practice of the five Rs promoted by environmental activist, writer and lecturer Bea Johnson, which is based on the "zero waste" movement, with the 5 Rs: reject, reduce, reuse, recycle and reincorporate, all with respect to what is not needed on the planet.

On the other hand, in the micro context of the problem, the Cuenca San Marcos Sucre Educational Institution, located in the San Jorge subregion in the department of Sucre. It has been evidenced a lack of education in relation to environmental care by the students who especially in the hours of rest make a bad use of plastic waste and garbage in general. On the other hand, the institution has a mandatory school environmental project, PRAE, which is adjusted annually.

Little is observed about the promotion of the ecological culture evidenced in aspects such as, the review of programs in the area of natural sciences and environmental education allows to glimpse the correlation, continuity and sequentiality, but no transversal axes are observed for the valuation of school environmental awareness (recycling, reuse of solid waste, care of the swamp and wetlands); a vision in the entire curriculum programming is not observed work that minimizes the impact of solid waste left by the community in general. Therefore, there are few environmental projects oriented to the formation of environmental awareness in students. The area programs still rely on traditional pedagogies, referring to strategies such as dictation, expository technique and transcription of texts to the notebook, undervaluing playful strategies for solid waste management in the community. At the same time, group work among the students, in the great majority, is carried out in an unequal manner, that is, some work and the others are figurative.

According to the background information reviewed regarding the subject of this project, it

is necessary to design and implement a strategy based on what the student likes in the infant stage, which is the playful activity together with an environmental pedagogy for the formulation and management of environmental pedagogical projects related to recycling and reuse of solid waste in the Educational Institution Institución Educativa Cuenca San Marcos Sucre.

The application of the interview as an instrument for collecting information made it possible to learn about aspects related to the fact that inside the educational institution, specifically at break time, there is a situation of high environmental pollution, precisely because of the irresponsible attitude of students to misuse the solid waste left over from the food they eat during this period of time, This does not mean that the school does not carry out actions to avoid this, on the contrary, strategies are developed to prevent this situation from occurring, but it is necessary to increase efforts to ensure that students do not leave any type of garbage or solid waste in the vicinity of the school at the end of the break time.

In relation to what should be done with the solid waste generated in the homes of the students, it is important to recognize the knowledge that they have about the attitude that should be assumed with solid waste, since when they consider that it should be recycled, classified and piled up to sell it, it is understood that the environment is taken care of at home, it is given to understand that the environment is taken care of at home, but before the way the students act in the educational institution, they denote that the existence of some shortcomings in this aspect, which undoubtedly leads to reflect on the values that are part of the human being to take care of the environment that surrounds him Corredor, (2016). Therefore, it is essential to effectively lead to this reflection in the educational environment, to be translated into facts that reflect respect for nature.

The environmental impact that can be produced by the attitude, not only of students, but of a large part of human beings for not taking care of the environment, produces harmful effects that affect both nature, as well as the human being himself, precisely for not giving that good management and protection of the natural environment Gutiérrez & Sánchez (2017). Therefore, all efforts made in the school environment to generate environmental awareness, redound positively in all living beings that inhabit the planet earth; hence the importance of developing research processes that seek the protection of the environment; hence the importance of the development of this article related to the research project carried out in an educational institution in order to generate environmental awareness, mainly in students, but also in members of the educational community.

Regarding the theoretical component, in which two relevant topics are embroidered, in this case, solid waste and environmental pedagogy, in relation to the first of them, For Galvis, (2016) solid waste corresponds to any type of material that is abandoned by the person who

produces it and that comes from various material forms such as the manufacture of products, the transformation of the same, the use or consumption of raw material products; or because of the cleaning that is performed and the throwing of those elements that remain as waste. Therefore, it can be stated that these are materials that in one way or another affect the environment in the place where they are produced without any care.

Solid waste can also be conceptualized as that organic material that can be used for various activities, mainly in the industrial and agricultural field, in industry, taking advantage of those materials that can be reused again for the production of raw materials, and in agriculture as fertilizer and ingredients to make the land a more productive environment in food production, (Tovar, 2018). Therefore, it is also considered as a highly serviceable element when it is harnessed for the welfare of the population.

Another aspect that is important to highlight within solid waste refers to the approach of Hernández (2021) arguing that these refer to materials, substances, objects or other types of elements that are the result of the consumption that the individual makes of a good in the development of various activities of a commercial, industrial, domestic, service or institutional nature, generally placed to be collected by the sanitation service, in the different spaces corresponding to a territory.

This concept of solid waste suggests that it refers to the collection of solid waste by a sanitation service, hence the importance of knowing what mechanisms are in place to prevent solid waste from being scattered in those spaces that facilitate the spread of the negative effects that the misuse of this waste has on the population. Therefore, it is possible to deduce the existence of a classification of solid waste.

In relation to the classification of solid waste, Galvis, (2016), considers that this classification is carried out indistinctly, that is, there are different ways to do it, since that is done taking into account aspects related to the origin of this waste and the disposal that is given at the end, the use of different materials, the use, recycling and combustion to which they are subjected, which is why they can be classified as follows: Organic (putrescible, non-putrescible); inert; hazardous and non-hazardous; urban; agricultural; leachate.

Analyzing each classification, it is important to recognize that the knowledge acquired about them makes it possible to carry out a better management of solid waste. With respect to organic waste, these are considered to be those materials that are part of living beings or transformed fossil fuels. Putrescible waste is generated by the use of natural materials that have not been transformed, but due to the humidity they receive, they become biodegradable, such as animal feces and food waste. On the other hand, non-putrescibles correspond to those whose biological characteristics have been modified; these are generally related to natural or synthetic fuels.

About environmental pedagogy, The concept of pedagogy makes reference to the

The teacher's own knowledge is constituted by the mastery of the relationships between knowledge and teaching, by the understanding of the meaning of the educator's activity within society and by the ability to discern the legitimate ways of transmitting knowledge, all of which is the object of rigorous study that transcends the proposals of common sense or of the educational rhetoric that permanently wants to set standards of action for the school (Mission of Science and Technology, 1990).

An important aspect of educational practice is Teaching, conceived as the set of strategies and techniques through which the environment is organized to promote learning and the maturation of the individual. The thematization of teaching practice has generated a body of concepts and processes that generically receives the name "Didactics". The concept of didactics includes the strategies that facilitate the teaching of a discipline and make learning possible.

While environmental education is fundamentally concerned with the preservation, protection and regeneration of the environment, pedagogy studies the incidence of the various intentional or unintentional, natural or artificial means in which educational action is carried out. In this context, pedagogy accepts that environmental education is education in favor of the environment. However, environmental pedagogy can integrate three stages: education about the environment, when it proposes the contents; education through the environment, in relation to the methodology and education in favor of the environment when it proposes the objectives and values to be achieved.

Such coherence contemplates the pedagogical conjunction regarding the unity of criteria, contents, methods and objectives, which would provide a more complete formative sense and the possibility of including environmental education in the school and in relation to the most worrying pedagogical aspects for teachers, such as: curricular organization, teaching methodology and didactic resources. In short, Environmental Pedagogy is a pedagogy that, for the first time, would not have as its ultimate goal human improvement but the protection of Nature for which man would be the mediator. As for Environmental Education, it is a type of education characterized by: Interdisciplinarity.

Environmental education is based on several scientific disciplines that have not been contemplated in teacher training, which is why it is necessary to form an interdisciplinary team that analyzes the environment in an integrated manner. In this regard, Montes and Leff (1986) state that "environmental problems demand a process of knowledge production that goes beyond technological integration". Inescapably, the curriculum has to adjust to the interdisciplinary approach since it demands the interrelation of multiple knowledge.

Materials and methods

For the development of the article based on the research conducted, the socio-critical paradigm will be taken into account. Alvarado and García (2008) quote Arnal (1992) and say that this author "adopts the idea that critical theory is a social science that is neither purely empirical nor only interpretative, the contributions originate "from community studies and participant research" (p. 68). Furthermore, Alvarado and García (2008) state that this paradigm "aims to promote social transformations by providing answers to specific problems present within communities, but with the participation of the members" (p. 190). This paradigm is necessary for this proposal because it seeks to transform and also requires the commitment of the population.

This study is circumscribed within qualitative research, where "the relationship between the researcher and the participants is one of total interdependence and it is pointed out that research should serve to improve the living conditions of marginalized groups in society" (Hernández-Sampieri, Fernández, & Baptista, 2014). In addition, it is framed in action research, since it implies that the community becomes the main agent of change to achieve the transformation of reality. According to the work of Martí, (2017) PRA has an order and phases, namely: Contextualization stage, Conceptualization stage and Significance stage, each of them taking into account the aspects that distinguish them.

The essential instruments for the collection of information will be subject to the following techniques; the field diary, which according to Fernandez (2001) is the,

Set of social processes of preparation and conformation of the subject, referred to precise purposes for a subsequent performance in the workplace. In addition, it is the educational process that takes place in higher education institutions, aimed at ensuring that students obtain knowledge, skills, attitudes, cultural and ethical values, contained in a professional profile and corresponding to the requirements for a given exercise of a profession (p. 45).

The focus group is also used, which according to Kitzinger (1995) is a form of group interview that uses communication between researcher and participants for the purpose of obtaining information. However, for Martínez-Miguel (1999), the focus group "is a collectivist research method, rather than individualistic, and focuses on the plurality and variety of the attitudes, experiences and beliefs of the participants, and does so in a relatively short period of time". It is pertinent to carry out a focus group in the proposal because it favors the interaction of the participation of all the participants in the group. It is taken in a non-parametric way, that is to say, selectively to a group of 10 boys and girls of the fifth grade of the educational institution Cuenca who are in the stage of concrete operations, they are characterized by being polite, they like to help with the school; most of them depend on the agricultural and fishing activities so they have to help in these tasks with their parents, because Cuenca has a beautiful swamp.

For this reason, the procedure began with the signing of informed consents by the parents of the population under study and then the instruments were applied. We proceeded to carry out the following activities: awareness campaign, build and recycle day, construction of daily goals, construction of ecological points with PET bottles. All of these activities were carried out in the aforementioned order. And as a whole, a note was made of what was observed in the field diary. Then the responses were classified in the categories of analysis, in order to carry out the interpretation. The interpretation from the hermeneutics arises from the establishment of a set of texts, normally called canons, the data of the transcriptions will be verified and the information of the population will be integrated, to finally generate the theories.

Result

Taking into account the revelations obtained in the development of the application of the data collection instruments, it was possible to identify and analyze the situation manifested around the problem addressed with respect to the reuse of solid waste and the promotion of environmental awareness in a grade of schooling. Through the field diary and the focus group interview, in this case with 10 fifth grade students, the results obtained are shown through the development of three stages, in this case, diagnosis, intervention and evaluation, which are in accordance with the objectives set.

First of all, the format of the observation of the students' behavior in relation to the conservation and preservation of the environment during rest hours is highlighted, in order to fulfill the objective of diagnosing the students' conceptions about the care of the environment.

With respect to the observation process carried out when the group of students was in the break time of the classes, in order to know the conduct or behavior of the students about the way they use solid or liquid waste from food or other elements in the break time during class hours. In order to carry out this process, the research team conducted a follow-up and permanent observation of the behavior of the ten students selected in the assigned sample, this procedure allowed to know the following:

During recess time, the students consumed various food products, generally bags of chips, potato chips, chitos, platanitos, among others, as well as soft drinks in cardboard boxes, plastic and water bags. The attitude assumed by these students was notoriously varied, because two of them, consciously or unconsciously, threw the residues of what they were consuming on the floor; Four of them went to the place where the garbage containers are, but they threw them as if they were trying to aim and some of them fell to the floor and were not picked up again; the other four also took the residues of the food they had consumed and deposited them correctly in the place for that purpose, that is, in the cans provided for that purpose; however, two students spilled the leftover liquids on the floor, causing a stain on the floor.

Another aspect that was evidenced regarding the treatment that the students do with the waste of what was consumed, was the way the students acted when they observed that other students threw papers, bags, bottles and cardboard boxes, and even they themselves manifested a lackadaisical attitude, that is, they did not react responsibly when they told their classmates to place the garbage in the right place, and even they did not pick up the garbage thrown on the floor.

In the institution there is only one place for the deposit of garbage and according to the norms that exist for such purpose, that is, to place in bags of the stipulated colors to throw disposable materials, white to deposit plastic, cardboard, paper, metal; green for the remains of food, agricultural waste; black for napkins, papers of non-usable products; but it is not a place to which one cannot go without any difficulty to throw the residues and wastes of the food that they left without consuming.

A worrisome situation was evidenced at the time of carrying out the observation during the break time of the students assigned in the sample, when they rang the bell to return to the classrooms, because in the middle of the chaos, several children pushed the garbage cans and one of them fell to the floor, spilling its contents, which motivated one of the teachers to call the attention of the students to lift the can and pick up the garbage from the floor. The attitudes demonstrated in this aspect of course, merit actions aimed at promoting environmental awareness in students, in order to achieve a better management of solid waste and garbage left over from the food they consume.

About the interviews conducted, each of the answers provided in the indicator related to what the student would do to improve environmental care, denotes certain knowledge about how to act to care for the environment, which is a good indication, but does not translate into practice because there is poor management of solid waste remaining from the products consumed in the educational institution. This undoubtedly becomes a reason to carry out actions aimed at a better behavior regarding the reuse of solid waste as a way to care for and preserve the environment.

Each of the answers provided in this indicator related to what the student would do to improve care for the environment, denotes certain knowledge about how to act to care for the environment, which is a good indication, but does not translate into practice because there is poor management of solid waste left over from the products consumed at the educational institution. This undoubtedly becomes a reason to carry out actions aimed at a better behavior regarding the reuse of solid waste as a way to care for and preserve the environment.

In a generalized manner and taking into account both the observation process carried out and formulated through the field diary, as well as the focus group interviews, it is important to make clear that there is awareness about the imperative need to care for, protect and preserve the environment and avoid pollution, which is one of the major causes that affect

it, not only in the educational institution, but also in the places where students and the community in general live together. Therefore, the results allow affirming and corroborating the existence of the knowledge that students have about the danger that looms over the planet earth by not making good use of solid waste.

However, it is perceived in the answers the existence of lack of commitment on the part of the students, because the behavior and / or attitude that they assume in the hours of recreational rest denotes the opposite of what they consider should be the performance with the care of the environment, this motivated because the actions that they assume throwing the papers, This is due to the fact that the actions they take by throwing papers, plastic bottles and other types of waste on the floor and not in the places established for that purpose, suggests that it is necessary to move from theory to practice, for which it is necessary to develop strategies to ensure that this knowledge translates into favorable facts for the environment and therefore for the human being himself. Therefore, it is necessary to take advantage of the knowledge that students have about the relevance of caring for the environment and the need to reuse solid waste, which can be achieved through the promotion of environmental awareness.

According to the results obtained, several aspects that are important to analyze and propose the development of possible strategies that contribute to the strengthening of environmental awareness in students, but also through them to the members of the communities of which they are an active part in their daily lives, can be clearly drawn.

There is no doubt that there are good intentions on the part of the students from a conceptual point of view about the improvement and care of the environment, this is because they are aware of the existing need to take actions to that effect, as Castilla & Miranda, (2019) make clear, when considering that it is essential that from the educational institutions strategies that motivate the entire educational community to protect nature, not only from the point of view of natural resources, but also with respect to those solid wastes that are formed in urban environments are promoted.

Very despite the fact that, in this aspect, students affirm that they should not throw garbage on the floor because it causes negative effects on animals, people, etc., the attitude assumed denotes the opposite, which undoubtedly can mean that there is a lack of environmental culture Barinas (2016), which is generally manifested in some homes, that is, the example that is lived at home when children observe that around them garbage is thrown on the floor or do not manifest a care for the environment.

Inside the educational institution, specifically at break time, there is a situation of high environmental pollution, precisely because of the irresponsible attitude of students to misuse the solid waste left over from the food they eat during this period of time, this does

not mean that the school does not carry out actions to avoid it, on the contrary, strategies are developed to prevent this situation from occurring, but it is necessary to increase efforts to ensure that students at the end of the break time there is no garbage or solid waste in the surroundings of the school.

In relation to what should be done with the solid waste generated in the homes of the students, it is important to recognize the knowledge that they have about the attitude that should be assumed with solid waste, since when they consider that it should be recycled, classified and piled up to sell it, it is understood that the environment is taken care of at home, it is given to understand that the environment is taken care of at home, but before the way the students act in the educational institution, they denote that the existence of some shortcomings in this aspect, which undoubtedly leads to reflect on the values that are part of the human being to take care of the environment that surrounds him Corredor, (2016). Therefore, it is essential to effectively lead to this reflection in the educational environment, to be translated into facts that reflect respect for nature.

The environmental impact that can be produced by the attitude, not only of students, but of a large part of human beings for not taking care of the environment, produces harmful effects that affect both nature, as well as the human being himself, precisely for not giving that good management and protection of the natural environment Gutiérrez & Sánchez (2017). Therefore, all the efforts made in the school environment to generate environmental awareness redound positively in all living beings that inhabit the planet earth; hence the importance of developing research processes that seek the protection of the environment.

There is a permanent concern to avoid environmental pollution and thus propitiate the destruction of the planet, it is there where the action of the educational process enters to play a very relevant role, since it becomes a space of awareness so that the human being from the early years of training begins to responsibly assume that care that nature and the environment deserve, as considered by Zita, (2019). In this sense, it is evident in the students effect of the research process and therefore the development of the article, the existence of knowledge about the ways how pollution can be avoided, in order not to cause damage to the planet as it is currently happening in all nations.

This knowledge that students possess is not put into practice because during the recreation period at school, they perform actions that denote this attitude of not caring for the environment, since most of them use other places to throw garbage and waste, less in the right place, in this case the place that the educational institution has for that purpose; for this reason, strategies should be developed so that these answers provided by the students are translated into tangible facts, where they use such waste as they propose, materials, recycling, among others, according to the approach of Aguilar (2016), because only in this way can the recovery of the environment and natural resources be achieved, in addition, to convert the space of the institution a pleasant and clean place at all times.

The work of the teacher in this aspect is highly fundamental, because he/she becomes a guide of the awareness-raising process Cabrejo (2018), is a key player in the implementation of environmental strategies capable of transforming the human attitude towards the care that should be taken with nature and all that it produces for the welfare of humanity.

The reuse of solid waste has been a permanent task of those who seek the protection and preservation of natural resources, an attitude that in the educational context students also recognize the need to reuse solid waste that can have another opportunity to serve humanity Cortes (2020), therefore, it is necessary that recycling programs are generated in the educational environment, since in addition to serving as a mechanism of environmental awareness, it can also be an element that enables the entry of economic resources to the institution that makes possible the improvement of the facilities.

Another aspect to be addressed in the aspect of reusing solid waste produced in the institution, is manifested in the need to promote this action, to be extended to the community environments where students live and coexist, because what they learn in the school environment they transfer it to the community, which undoubtedly results positively in what Soto (2020) considers as a key element to generate a recycling environment that contributes to the economic development of people engaged in recycling in the performance of work activities.

The educational institution can contribute so that the student recognizes this recycling work as a key element for the protection and preservation of the environment, supporting and collaborating with those people whose livelihood is through recycling. There are several mechanisms and models that have been implemented in order to create environmental awareness, one of these is related to the five ecological R's, Bellido (2019), in this case, recover, recycle, reuse, reduce and reject, letters that students know the importance they have for the implementation of environmental awareness in the classroom, a fact that is manifested through the answers provided, adducing mostly that the r of greater transcendence for them is to recycle and reuse or reuse.

It is essential to strengthen in the educational institution the mechanisms that enable students to make good use of disposable items in the educational institution, not only in the hours of rest or school recess, but also in the classroom, which sometimes also becomes a space where papers or other materials used for the development of school activities are thrown. For this purpose, it is possible to develop motivational strategies that generate interest in preserving nature, caring for the environment and beautifying the school entity Febles (2014).

All these elements, approached individually and in accordance with the five questions posed in the focus group discussion and the application of the interview technique, allow to raise in a general way, the importance derived from the need to promote environmental

awareness, not only through the reuse of solid waste, but, most importantly, to carry out actions aimed at preventing nature from being valued and protected; providing tools to the population about how it should be preserved and protected.

On the other hand, it is important to analyze that the environment when not taken care of or protected the environmental impact on the territories is highly detrimental, since, from the technical point of view, this impact leads to the alteration that occurs on nature, generally due to natural or anthropic situations, in which both the human hand and nature itself intervene through natural disasters Galvis (2016).

The environmental impact is mainly due to the human attitude towards those who should be protected and preserved, that is, nature; this behavior can be positive or negative, the former when a responsible and caring action is manifested, and the latter when a destructive and aggressive attitude is assumed against it.

This situation of affectation to the environment, produced by the negative impact that is being manifested in the world, is born from the small actions that are performed daily, such as those that occur in the school or community environment, making bad use of the waste that remains of what is consumed daily, as well as the garbage that students throw on the floor during recreational hours, which can be reproduced in the place where other activities are developed, becoming a snowball that grows more and more until it causes a debacle. For this reason, there is a need to raise awareness among the student population about the importance of preserving the environment by making good use of solid waste.

Conclusions

Taking into account the analysis of the results and the discussion of them as a conclusion, the following aspects can be established and related to the positions expressed by the students through the instruments used in the collection of information. It is important to recognize the existence of a problematic situation that affects the educational institution related to the poor management that students give to solid waste after consuming food at break time, particularly fifth grade students of the Educational Institution Cuenca San Marcos, Sucre. From a conceptual point of view, the students' knowledge of the way in which the environment should be treated and cared for, as well as the treatment that should be given to solid waste, is evident in the students, a fact that is not evident in the behavior of some students when they misuse garbage or throw it on the floor.

Usually the behavior at home of the students with reference to throwing waste or garbage on the floor at home is very good, because they claim that they do not litter at home, but in the educational institution they act in the opposite way, which may happen because in the educational institution there is no strict surveillance to prevent students from throwing garbage on the floor, a fact that is considered as the respect that should be had with respect to the student's freedom, but that in a certain way certain restrictions should be manifested

that are contemplated in the coexistence manual in this aspect.

The strategies that have been implemented in the educational institution in order to generate environmental awareness in students and the educational community have not given the expected results in a large part of the student body, which undoubtedly merits the generation of new ways to encourage and motivate them to create environmental awareness in all members of the institution. It is necessary to take advantage of the fact that students recognize the need to recycle solid waste, implementing actions that motivate them to make good use of them for the benefit of the institution and the students themselves by taking advantage of the economic resources derived from the good use of recyclable materials, in addition to contributing as a mechanism to promote business entrepreneurship.

With regard to teachers, it should be taken into account that their educational work includes the task of making students aware of the responsibility they have as human beings towards nature, hence the need to take care of it, using the corresponding subject, not through demanding actions, but as an awareness-raising mechanism, for which they should use their persuasive and innovative abilities. The implementation of didactic, pedagogical and recreational strategies can become an alternative solution for students to strengthen their environmental awareness with greater enthusiasm, so that they become true guardians of nature, capable of generating in the environment where they live the conviction of the importance of caring for the environment, of recycling responsibly those materials that can be used for other purposes.

As for the achievement of the proposed objectives, these were directed towards the development of actions such as diagnosing the students' conceptions about the care and preservation of the environment in particular, collection, the 5Rs and reuse of solid waste, which was achieved through the development of the observation format and the discussion with the focus group through an interview in which they answered five questions alluding to the reuse of solid waste to promote environmental awareness in fifth grade students of the Cuenca Educational Institution of the municipality of San Marcos, Sucre. Regarding the objective of proposing the design of a playful strategy, it is important to clarify that this is planned as an action to be developed in the educational institution and as a mechanism that leads to the implementation of activities in which students are actively involved in actions related to the protection and conservation of the environment and reuse recyclable elements for the benefit of the school. For this reason, the implementation of the strategy will be carried out within the teaching process that takes place in the institution and as a way to contribute to the beautification of the institution and as a mechanism to promote environmental awareness in students.

References

- Aguilar, C. (2016). Recycling and environmental awareness in improving the sustainability of the planet. *Journal of Research and Culture*, vol. 5, no. 1 pp.34-43, 2016 Universidad Cesar Vallejo. Retrieved from <https://www.redalyc.org/journal/5217/521753139004/html/>, 1-12.
- Barinas, D. (2016). *Reuse of solid waste as an alternative for training in environmental conservation by developing new materials for the early childhood education teacher*. Obtenido de <https://doi.org/10.29394/scientific.issn.2542-2987.2016.1.1.10.169-189>
- Bellido, L. (2019). *The 5 R's to achieve a plastic-free life*. Retrieved from <https://www.elmundo.es/https://www.elmundo.es/yodona/lifestyle/2019/04/14/5cb2f445fc6c83a7628b4667.html>.
- Bravo, A. (2015). *Development of environmental awareness through the five R's system in students of the educational institution las maravillas in the district of Monzon*. Retrieved from <http://repositorio.udh.edu.pe/123456789/779>
- Cabrejo, R. (2018). *Environmental education in solid waste management at the centro de materiales y ensayos*, SENA, Bogotá. Retrieved from <https://repository.usta.edu.co/bitstream/handle/11634/16121/2018angelacabrejo.pdf>.
- Castilla, E., & Miranda, R. (2019). Proyecto Escolar PRAE, pedagogical strategy of awareness and Care of the Environment. Barranquilla: Universidad de la Costa.
- Colombia, U. E. (2020). *Waste generation and management during the Covid19 pandemic*. Retrieved from <https://medioambiente.uexternado.edu.co/https://medioambiente.uexternado.edu.co/generacion-y-manejo-de-residuos-durante-la-pandemia-del-covid-19/>
- Cortes, M. (2020). *Reuse and utilization of solid waste generated in the Yacula village in the municipality of Barbacoas, Nariño*. Retrieved from <https://repository.unad.edu.co/bitstream/handle/10596/36740/RAEnecortest.pdf?sequence=2&isAllowed=y>
- Corredor, J. (2016). School environmental project: links and contributions to the life project. *Eureka*, 2(5), 1-17.
- Criollo, D., & Ortega, S. (2014). *Pedagogical strategy for the proper management of solid waste with fifth grade students in the municipality of Tambo, Nariño*. Retrieved from <https://repository.libertadores.edu.co/bitstream/handle/11371/249/MariaGloriaCriolloBurbano.pdf?sequence=2&isAllowed=y>

- Denzin, N., & Lincoln, Y. (2014). *The Sage Handbook of Qualitative Research*. London, England: Sage.
- National Planning Department (2019). *Comprehensive solid waste management plan*. Bogotá: DPN.
- Febles, M. (2014). *On the need for the formation of environmental awareness*. Havana: University of Havana, Faculty of Psychology.
- Galvis, J. (2016). *Solid waste: problem, basic concepts and some solution strategies*. Retrieved from <https://revistas.ucp.edu.co/>
<https://revistas.ucp.edu.co/index.php/gestionregion/article/download/149/146>
- García, E., & Amézquita, J. (2017). *Design of an integrated waste management model in diverse sociocultural contexts, under the zero waste approach: the cases of Mitú (Vaupés) and Buenavista (Sucre)*. Retrieved from <https://repository.javeriana.edu.co/>
<https://repository.javeriana.edu.co/bitstream/handle/10554/38023/Amezquita>
- Gutiérrez, J., & Sánchez, L. (2017). *Sustainable development and environmental management*, third edition. Lima: Universidad los Ángeles de Chimbote.
- Hernández, A. (2021). Analysis of solid waste management in Colombia. *Universidad Militar Nueva Granada, Bogotá*, 1-26.
- Iberoamericana, U. (2022). *Vision and mission*. Retrieved from <https://www.iberro.edu.co/>
<https://www.iberro.edu.co/>
- Kabato, S. (2021). *What is habitus*. Retrieved from <https://www.psicoadapta.es/>
<https://www.psicoadapta.es/blog/que-es-el-habito/>
- Kitzinger, J. (2005). *Qualitative Research: introducing focus group*. *BMJ*, 311:299-302. New York: Focus Group.
- López, S. (2018). *Realization of solid waste construction with eco-bricks in a rural educational environment*. Retrieved from <https://repository.upb.edu.co>
- Martínez, M. (2017). *La investigación cualitativa etnográfica en educación, fourth edition*. Mexico: Trillas.
- MEN (1998). *Natural Sciences and environmental education. Lineamientos Curriculares*. Bogotá: Ed. Magisterio.
- Montes, C. (2018). *Study of solid waste in Colombia*. Bogotá: Universidad Externado de Colombia.
- Pozo, J. and Monereo, C. (1999). *El aprendizaje estratégico*. Madrid: Santillana.
- PMI (2021). *Institución Educativa Cuenca San Marcos Sucre*.

- Ruiz Olabuenaga, J.I. and Ispizua, M.A. (Ed.) (1989). The decoding of everyday life. Bilbao: Publications of the University of Deusto.
- Sureda & Colom (1989). Environmental Pedagogy. Ed. CEAC. Barcelona.
- Soto, R. (2020). *Only 17% of Colombia's solid waste is recycled*. Retrieved from <https://www.agronegocios.co>: <https://www.agronegocios.co/clima/solo-el-17-de-los-residuos-solidos-de-colombia-son-reciclados-advirtio-el-dnp-2970019>
- Tovar, L. (2018). Formalization of trade recyclers' organizations in Bogotá. Reflections from the popular economy. *Iconos Publicación De FLACSO-Ecuador*, 22(62), 39-63. 10.17141/iconos.62.2018.3230, 1-24.
- Universidad Externado (2020). Waste generation and management during the COVID-19 pandemic . from: <https://medioambiente.uexternado.edu.co/generacion-y-manejo-de-residuos-durante-la-pandemia-del-covid-19/>
- Zita, A. (April 18, 2019). Environmental impact. Retrieved from <https://www.todamateria.com>