ENVIRONMENTAL EDUCATION WORKSHOPS TO MITIGATE THE ENVIRONMENTAL PROBLEMS IN THE REGION OF MADRE DE DIOS - PERU

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ABSTRACT

Objective: Determine to what extent environmental education workshops mitigate the environmental problems of the Madre de Dios region - Peru.

Theoretical framework: The currents that stand out most in environmental education are: conservationist, naturalistic, systemic, scientific, decisive, humanistic and moral-ethical.

Methodology: Applied quantitative approach, quasi-experimental design and explanatory level, the units of analysis were two independent samples (control and experimental group), made up of students from a regular basic secondary institution in the Madre de Dios region, the technique was observation and the instrument was the checklist.

Results and conclusion: The environmental education workshops significantly mitigate the environmental problems of the Madre de Dios region, since the p-value associated with the Mann Whitney U statistic (Sig. Asymptotic) is 0.000; This value is less than 0.05, then at the 1% significance level; The total scores are different in both groups after carrying out the environmental education workshops with the students.

Implications of the research: Environmental education in regular basic education contributes to the practice of environmental values, since it seeks through problematic situations to make the relationship between the learning contents and the reality of the context that surrounds the students. These, in turn, build their representations of reality and begin to commit more consciously to their individual and collective actions in the environment in which they live.

Originality/value: The article offers results from the application of environmental education workshops to mitigate environmental problems in the Madre de Dios region of Peru.

Keywords: Environmental Care, Environmental Values, Environmental Behavior, Quality of Life.

TALLERES DE EDUCACIÓN AMBIENTAL PARA MITIGAR LA PROBLEMÁTICA AMBIENTAL DE LA REGIÓN DE MADRE DE DIOS - PERÚ

RESUMEN

Objetivo: Determinar en qué medida los talleres de educación ambiental mitiga la problemática ambiental de la región de Madre de Dios - Perú.

Marco teórico: Las corrientes que más destacan en la educación ambiental son: conservacionista, naturalista, sistémica, científica, resolutiva, humanista y moral-ética.

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Metodología: Enfoque cuantitativo de tipo aplicada, diseño cuasiexperimental y nivel explicativo, las unidades de análisis fueron dos muestras independientes (grupo control y experimental), conformadas por los estudiantes de una institución básica regular de nivel secundario de la región de Madre de Dios, la técnica fue la observación y el instrumento la lista de cotejo.

Resultados y conclusión: Los talleres de educación ambiental mitigan de manera significativa la problemática ambiental de la región de Madre de Dios, puesto que el p-valor asociado al estadístico U Mann Whitney (Sig. Asintótica) es de 0,000; este valor es menor a 0,05, luego a nivel de significancia de 1%; las puntuaciones totales son diferentes en ambos grupos después de realizar los talleres de educación ambiental con los estudiantes.

Implicaciones de la investigación: La educación ambiental en la educación básica regular, contribuye a la práctica de valores ambientales, puesto que busca a través de situaciones problemáticas hacer la relación entre los contenidos de aprendizaje y la realidad del contexto que rodea a los estudiantes. Estos, a su vez, construyen sus representaciones de la realidad y comienzan a comprometerse más conscientemente con sus acciones individuales y colectivas en el ambiente en que viven.

Originalidad/valor: El artículo ofrece resultados de la aplicación de talleres de educación ambiental para mitigar problemática ambiental de la región de Madre de Dios de Perú.

Palabras clave: Cuidado del Medio Ambiente, Valores Ambientales, Conducta Ambiental, Calidad de Vida.

1 INTRODUCTION

The research is related to environmental education through workshops, to mitigate the environmental problems of the Madre de Dios region. For Mendonça and Zanon (2023), environmental education is defined as a process aimed at building a society with values and developing the capacities, aptitudes and attitudes necessary for the harmonious coexistence of man with his culture and his environment; On the other hand, for Mejía et al. (2022) the environmental education workshops aim to promote good practices in caring for the environment in students. Environmental problems practically affect almost all elements of nature: water, soil, flora, fauna, climate and others (Murcia, 2023).

According to Guevara at al. (2023), a fundamental characteristic of modern education must respond to the current needs of society and transform its social dynamics and its student learning process; Therefore, it is necessary to introduce environmental education into the pedagogical practices of educational institutions in order to develop capacities, aptitudes and attitudes of students so that they coexist in harmony with nature and, in this way, environmental problems are reduced to a minimum. local, regional and national.

The research aims to mitigate the environmental problems of the Madre de Dios region, through environmental education workshops, since it is difficult to perceive, from the interoceanic highway, the environmental crime that is committed in La Pampa, an area between the 98 and 115 kilometers of the aforementioned highway, on which the Madre de Dios gold exploitation is concentrated. Entering this place, which is part of the buffer zone of the Tambopata National Reserve, is a high-risk activity for those who do not work there. However, the scenario is clear and bleak, and it is difficult to understand the sources of deforestation.

According to Aguilar, (2023) environmental problems result from the introduction of harmful substances and elements into the environment or into a living being sensitive to them,
affecting their well-being and causing damage with a high negative impact on the natural balance of life.

One of the main causes of environmental problems is human activity. According to Morote and Colomer, (2021) technology has made considerable progress in improving the quality of life, but it has also had a significant negative impact on the environment. Furthermore, for Castro and Leal, (2023) industrial activities generate large quantities of toxic waste for the environment.

For Brias et al. (2022) deforestation or the indiscriminate felling of trees has significantly reduced the planet’s forests and jungles and has even led to the extinction of several of these natural spaces. Likewise, for Laso et al. (2022) trees and other plants serve as air purifiers, so their absence causes air pollution and various respiratory diseases that can be fatal.

Currently, according to Rios and others (2023), the level of waste generation (garbage) is very high and most of it is related to the massive use of plastics, as well as other non-biodegradable products. To limit its effects, it is advisable to select the type of waste (aluminum, plastic, glass, cardboard or paper) so that it can be recycled or reused in the recycling process (Matos, 2022).

According to Munsibay and Cavero (2022), the deforestation caused by gold mining and the impact of mercury pollution in Madre de Dios is worrying. According to the study, 67.5% of forest losses equivalent to 64,586 hectares occurred between 2009 and 2017., in these years the so-called interdiction period occurred. During this period, deforestation peaked in 2017, when gold mining was also confirmed to be the leading cause of soil degradation throughout the Madre de Dios region.

Regarding the construction of the intercontinental highway, the deforestation rate increased by 425% between 2006 and 2011 (Munsibay and Cavero, 2022). The La Pampa area and most of the area where illegal mining is carried out was created by a strong migration of Puno, Arequipa and Cusco people. This migration took place along this path. Now the miners who arrived in those years are already inhabitants of Madre de Dios and are electing their authorities. It is no coincidence that more than 50% of the GDP (gross domestic product) of this region comes from mining (Munsibay and Cavero, 2022).

On the other hand, the problem of mercury contamination of fish in the region. Although some studies have already been carried out in rivers near the gold mines, it is in the area called La Pampa where the largest amount of mercury released in the entire region is found, which amounts to 79.5% of the total (Munsibay and Cavero, 2022). This is to be expected: being the great emporium of illegal mining, illegal and informal miners prioritize the extraction of gold in the shortest possible time, they do not use alternative methods such as those that already exist to extract gold without using mercury. According to Munsibay and Cavero (2022), each year 110 tons of unregistered gold would be extracted in Peru, that is, clandestine. More than 57.4% would come from La Pampa. This illegal and informal mining activity would bring in more money than drug trafficking. What makes this activity so harmful to human health and the environment.

The consequences are devastating when water and soil are contaminated, necessary for life, this causes damage and harms the health of the inhabitants, who in various ways suffer environmental problems that disrupt their daily lives, such as respiratory, dermatological, cardiovascular, mortality and hygiene problems in an area where the water is contaminated and there is no access to drinking water, disorders of the integral development of children, neurological damage and various types of cancer.

Likewise, according to Silverio and Cavalcanti (2022) it is harmful to the ecosystems, because in Madre de Dios their natural balance would be altered by the high level of pollution, many species have become extinct and others are about to become extinct.
The interest in carrying out this research was based on the information and knowledge needs on which future research on environmental matters should be based, combining the scientific offer with the needs of the environmental sector, whose development is of particular importance for the State in the long term. So that the knowledge generated in this research can contribute both to the prevention and mitigation of the main environmental problems and to the improvement of the quality of life of the inhabitants of the Madre de Dios region.

Research question: To what extent do environmental education workshops for students mitigate the environmental problems of the Madre de Dios region – Peru? Therefore, the objective of the research was: Determine to what extent environmental education workshops for students mitigate the environmental problems of the Madre de Dios region - Peru.

Importance of the study, educational institutions are privileged places to carry out activities that provide students with a reflection on environmental problems, which can be guided by projects and participation processes that lead to self-confidence, positive attitudes and personal behaviors towards environmental protection. Environment, applied in an interdisciplinary way.

In educational institutions, ways must be found to raise awareness among young people so that they understand natural phenomena, human actions and their consequences for themselves, their own species, other living beings and the environment. In this way, each student can develop their potential through environmental education workshops and adopt personal attitudes and constructive social behaviors, thus contributing to building a socially just society and, consequently, a healthy environment.

Within the framework of Environmental (2022) Education, according to Reséndiz, regular basic education institutions must sensitize students about the values that lead to a harmonious coexistence with the environment and with the other species that inhabit the planet, helping them to critically analyze the factors that have led to the destruction of natural resources and various species. Likewise, according to Pérez and Camacho, (2023) they are aware that nature is not an inexhaustible source of resources; its reserves are finite and must be used rationally, avoiding waste and considering recycling as a vital process.

By raising awareness among students about environmental education, educational institutions can provide them with initiatives that transcend the educational community and extend their learning to the environment in which they live. Teachers are the main agents of change, presenting proposals focused on raising awareness, behavioral change, skill development and evaluation capacity. Implementing environmental education in the educational institution today continues to be difficult, although possible, since there are great difficulties in awareness-raising and training activities, in the implementation of activities and projects, especially in the maintenance and continuity of the already existing.

In short, for Posso et al. (2022) the educational institution is a social space and the place where students can become aware of environmental actions and thus be able to carry out this socialization process outside the school environment, beginning to have correct environmental behaviors that must be learned in practice, in life, daily school life and contributing to the formation of responsible citizens. Considering that environmental education is a continuous process, training projects must be implemented for teachers and students so that they are able to combine and apply the basic principles of environmental education.

Environmental education is of utmost importance in today's society due to the growing environmental challenges we face. The most notable reasons to understand why environmental education is crucial:

Environmental awareness: Environmental education fosters awareness about environmental problems and threats facing our planet, such as climate change, biodiversity loss, air and water pollution, among others. This helps people understand the importance of caring for and preserving the environment.
Behavior change: Environmental education can inspire positive behavior change. By understanding the consequences of our actions on the environment, people are more willing to adopt more sustainable practices, such as reducing resource consumption, recycling, conserving energy and using cleaner means of transportation.

Sustainability: Environmental education promotes sustainability, which is the ability to meet present needs without compromising the needs of future generations. As people better understand sustainability concepts, they can make more informed decisions in their daily lives and in decision-making at the community and government levels.

Citizen participation: Environmental education empowers citizens to actively participate in decision-making related to the environment. This may include participating in conservation groups, voting for environmental policies, and promoting business and government responsibility in protecting the natural environment.

Biodiversity Preservation: Environmental education highlights the importance of biodiversity and healthy ecosystems. When people understand the interconnectedness of all life on Earth, they are more motivated to support the conservation of endangered species and the preservation of natural habitats.

Climate change mitigation: Environmental education also plays a fundamental role in the fight against climate change. By teaching about the causes and consequences of global warming, people are motivated to reduce greenhouse gas emissions and support policies that promote the transition to clean, renewable energy sources.

Global Responsibility: Since environmental issues know no borders, environmental education fosters a mindset of global responsibility. People are beginning to understand that we are all stewards of the planet and that our individual actions have an impact on a global scale.

2 THEORETICAL FRAMEWORK

Research on environmental education has shown that the achievements and advances in environmental education have been incorporated into the legislation of the countries as programs and projects; in the last decade the execution of these projects in educational institutions was not effective, especially in the regular basic. This points to a difficult situation for teachers who wish to integrate an environmental dimension in schools and educational institutions.

According to Perico et al. (2022), most of the research related to environmental education in educational institutions showed a normative conception, based on the content of environmental conservation, in which knowledge with scientific content is highly valued and it is assumed that through this knowledge and the By changing attitudes it is possible to overcome the environmental crisis. In the current paradigm, nature continues to be understood as a resource that must be controlled and used, and the task of environmental education is to develop attitudes that allow its rational use. Therefore, the inclusion of environmental education in the curriculum differs little from the activities already carried out in the natural science disciplines, especially geography.

However, according to Aragón et al. (2023)There are other trends in educational institutions, some of which are more naive in their interpretation of environmental problems, attempting to develop environmental education work, but adopting an ahistorical point of view and neglecting the political, social, economic and cultural dimensions in their understanding of environmental education. Others are more likely to raise questions and bring a more critical perspective and political and historical elements to the debate. They take social relations into account in their definitions of the environment and recognize the potential of education to generate social change, but not as a savior. They recognize the transversal and interdisciplinary
nature of environmental education, but due to the difficulties inherent in the structure of regular basic education, their theory is poorly reflected in classroom practice.

Muñoz (2023), the predominant way of doing and thinking about environmental education is a consolidation that creates a false consensus on the problem that delegitimizes the pluralism characteristic of the field. Environmental education in this context, the need arose to (re)politicize the practice of environmental education, with various educators appearing in the field, expressing the colors, flavors and meanings of identity in the process of revaluation of theoretical and methodological references. Highlighting the existing polysemy in the field of environmental education. Nowadays, therefore, many new qualifiers can be found for education born with adjectives and other possibilities arise, namely, critical, transformative, emancipatory, popular, ecological knowledge, education in the process of environmental management (Mendonça and Zanon, 2023).

These currents aim to change the position of education, especially environmental education, as an important element in the construction of a more socially just, ecologically sustainable and egalitarian society, complementing the education of Paulo Freire, Carlos Brandão, Edgar Morin and many other educators. (Mejía et al., 2022). These convergences enrich the practice of environmental education and show coherence with the transformation of the world. The starting point is, therefore, a political-pedagogical project of social transformation based on the principles of social and environmental justice, democracy and happiness.

The approach to the field of environmental education makes it possible to make visible the diversity of proposals that appear and are legitimized as pedagogical practices (Reséndiz, 2022). It also allows us to see and understand the field of environmental education as a multiplicity of possibilities, analyzing it as polysemic, permeated by theoretical and political passions, disputes and conflicts over interpretations of the world and utopias. Therefore, it is important to clarify what type of environmental education is necessary to help teachers better frame and reflect on their own practice (Silverio and Cavalcanti, 2022).

The role of environmental education, along with other social practices, is to contribute to the transformation of society and form citizens with critical awareness, autonomy, solidarity and awareness towards the world in which they live. Therefore, it must be understood not only from a rational and substantive point of view, but also from a philosophical one, which allows for the inclusion of an ethical dimension that guides the relationship between human beings and nature, as well as the relationship between human beings, there, lies its specificity (Aguilar, 2023).

Environmental education within the various social activities that are the object of discussion and reflection is a recent historical process that needs to be highlighted for its trajectory and the importance it has acquired over the years. It is important to know this progression because it shows how environmental education has been established as a field of knowledge (Castro and Leal, 2023).

As Schilbert and Scheersoi point out (2023), the emergence of the ecological crisis as a specific educational problem was preceded by a certain greening of societies. This greening began when the environment stopped being an exclusive concern of nature lovers and became a concern of civil society in general. This process of greening Western societies began in 1945 and gave rise to the appearance of environmental education. That same year, during World War II, atomic bombs were dropped on the civilian population of the Japanese cities of Hiroshima and Nagasaki, becoming one of the first milestones in modern ecology. As the years passed, especially in the 1960s, environmentalists began to question various values of capitalist society. Conservation, conscious consumption, autonomy and pacifism were some of the banners of those who called themselves "ecologists." With the oil crisis in the early 1970s, several countries intensified the race for nuclear energy. This process gave rise to the emergence of an
organized and consolidated social movement: the environmental movement. The antinuclear fight gave identity to the environmental protests.

In this context, in the 1960s several social movements emerged politically, including the environmental movement (Perico et al., 2022). As a result of this movement, struggles also occurred around different issues; Among them, the following stand out: Extinction of species, deforestation, use of pesticides, unlimited urbanization, demographic explosion, air and water pollution, food contamination, soil erosion, reduction of arable land due to the construction of large dams. At that time, there was hardly any area of human activity in which struggles and demands occurred that the environmental movement could not contain (Posso et al., 2022).

Guevara et al. (2023) They point out and problematize important historical elements that have shaped the direction and foundations of environmental education. According to the authors, the name "environmental education" was first adopted in 1965 at an educational event organized by Keele University, in the United Kingdom.

The well-known United Nations Conference on the Human Environment, held in Stockholm (Sweden) in 1972, constitutes a milestone of great global significance. It was the first world conference on the human environment, with environmental education at a historic moment for world society, during the period of the so-called Cold War (Perico et al., 2022).

Shortly after this event, the institutional duo of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the United Nations Environment Program (UNEP) were credited with the creation of the Institutional Program for Environmental Education (PIEA), which was the international organization responsible for promoting the Connect newsletter, published in five languages (English, French, Arabic, Russian and Spanish) and distributed at the time to twelve thousand people and institutions involved in the promotion of environmental education (Posso et al., 2022).

Thanks to this process, environmental education became a specific field with international recognition. These events had a global character that allowed public recognition of environmental education in society. In 1975, the first international seminar on environmental education was held in Belgrade (former Yugoslavia) (Morote et al., 2021). In this seminar, experts from the fields of education, biology, geography and history, among others, met and defined the objectives of environmental education, which were reflected in the so-called Belgrade Charter. To this end, emphasis was placed on environmental education as a comprehensive educational process, whether formal or informal, that encompasses political, cultural and social dimensions, capable of creating new values, attitudes and skills consistent with the sustainability of life on the planet. (Silverio and Cavalcanti, 2022).

According to Castro and Leal (2023), after 1975, other events took place to continue advancing environmental education in an international context. From October 14 to 26, 1977, an intergovernmental conference on environmental education was held in Tbilisi, Georgia (former USSR), in which it was stated that environmental education is a pedagogical tool to express the environmental and social dimension, problematize reality and thus trying to understand the roots of the crisis of civilization. Many of the Tbilisi guidelines remain in force today, underscoring the importance of this event as the most important for the development and validation of environmental education worldwide. Another important event in 1979 was the Environmental Education Seminar for Latin America, held in Costa Rica. and the Latin American Seminar on Environmental Education, held in Argentina in 1988. Both events emphasized the need to protect historical and cultural heritage and the strategic role of women in promoting local development and ecological culture.

In August 1987, the International Congress on Ecological Education and Training, held in Moscow, reviewed progress and ratified the Tbilisi Guidelines, emphasizing support for the organization of information and communication networks among professionals and advocating
for training of specialist technicians as a prerequisite for instrumental interventions in accordance with permanent sustainable parameters (Perico et al., 2022).

Later, in 1992, the International Conference on Environmental Education was held in Rio de Janeiro, at the same time as the official Rio 92 Conference. The Treaty on Environmental Education for a Sustainable Society and Global Responsibility was prepared, which expresses the concerns of educators from Countries from all continents reflect on environmental education and establish a set of collective commitments for global civil society (Rios et al., 2023).

In 1997, the conference "Environment and society: education and public awareness for sustainable development" was held in Thessaloniki. It focused on teacher training, the development of teaching materials and small meetings of teachers to exchange experiences, being a global event (Morote and Colomer, 2021).

3 METHODOLOGY

Research is applied, since its main objective is to generate knowledge of practical and immediate application, aimed at solving specific problems of local, regional and national interest. It contributes to practical purposes, with the aim of solving environmental problems and controlling practical situations, that is, through environmental education workshops, the environmental problems of the Madre de Dios region were mitigated.

The level of research was explanatory, since its objective is to identify the factors that determine or contribute to the occurrence of the phenomena. Furthermore, it is the level that deepens the knowledge of reality, because it explains the reason, the why of things. It is, therefore, the most complex and delicate type.

The research focus focused on quantitative and qualitative indicators, since the objective is to mitigate, through environmental education, the environmental problems of the Madre de Dios region.

The hypothetical deductive method was also used, since this method is responsible for identifying the problems that exist between expectations and possible theories that will be tested in order to find and test more fair and plausible solutions for reality. After all, when a theory is tested and analyzed using Popper's hypothetical method, the goal is to compare it with other laws or theories related to the topic under study.

The research design was experimental (quasi-experimental), with a control and experimental group with two pre- and post-test measurements. The independent variable was the environmental education workshops and the dependent variable was environmental problems.

The study population was students from a secondary educational institution in the Madre de Dios region. The sample was composed through non-probabilistic sampling for convenience, control and experimental groups.

The observation technique was used in the study, while the instrument was a checklist. Using the expert evaluation technique, the instrument was validated; the experts confirmed the validity of the content, form and structure of the instrument and rated it excellent. Furthermore, the reliability of the instrument was determined using a pilot sample of 20 people and the data obtained were subjected to the Cronbach's Alpha test with a value of 0.921; This indicates high reliability of the instrument. On the other hand, to analyze and interpret the results of the research, it was carried out using descriptive and inferential statistics.

4 RESULTS

The environmental education workshops significantly mitigate the environmental problems of the Madre de Dios region, since in the experimental group the asymptotic Sig.
(bilateral) associated with the Mann Whitney U statistic (Asymptotic Sig.) is 0.000; This value is less than 0.05, at the 1% significance level; The total scores are different after carrying out the environmental education workshops with the students.

Table 1. Test statistics for the dependent variable in pre- and post-test.

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>190,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>380,000</td>
<td>215,000</td>
</tr>
<tr>
<td>Z</td>
<td>.000</td>
<td>-5,543</td>
</tr>
<tr>
<td>Asymptotic sig. (bilateral)</td>
<td>1,000</td>
<td>0.000</td>
</tr>
<tr>
<td>Exact meaning [2*(unilateral sig.)]</td>
<td>1,000b</td>
<td>,000b</td>
</tr>
</tbody>
</table>

to. Grouping variable: Group
b. Not corrected for ties.

Source: self made.

From the perspective of the findings obtained in this research, it is deduced that environmental problems are a reflection of the knowledge associated with the experiences of students in school life. Given that environmental problems are events that define human behavior, this understanding suggests that the individual is limited in this relationship to possibilities associated with cognitive and affective aspects. Environmental education is a global change that the world needs. Only through lessons learned from nature can we save the world.

5 DISCUSSION

Interest in the environment, characterized by responsibility, can be understood ethically as a generator of positive action for the environment through environmental education, which leads individuals to a clear understanding of the mutual relationship between them and the environment with environmentally friendly behaviors. In this context, for Castro and Leal (2023) environmental education is a way to understand phenomena such as urban and rural stress, place attachment and spatial appropriation, sharpen perceptions and knowledge of the environment for values and beliefs., and adopt pro-environmental behaviors, guaranteeing the construction of sustainable development and contributing to the promotion of quality of life.

Environmental education is responsible for creating significant processes through which people and groups of individuals build social values, knowledge, skills, attitudes and competencies aimed at protecting the environment, and to promote a better quality of life by applying the principles of sustainable development. It is a fundamental element of education and must be systematically integrated into all educational sectors, at the different levels and modalities of the formal and informal educational process (Aragón et al., 2023).

In this way, students will be sensitized to fully apply more sustainable practices, and this will be possible through an education focused on complex environmental content and sustainable activities in an interdisciplinary manner in relation to their context, which makes them culturally conceptualized with a new consciousness based on full respect for all forms of life. According to Reséndiz (2022), environmental education can create a new reality and develop new attitudes in society by raising citizens' awareness of personal attitudes and constructive social behaviors to create a pleasant environment in a framework of reciprocity that benefits both parties.

In the educational institutions of Madre de Dios, there is a great diversity of cultures, as well as social classes. This diverse integration is often difficult, but the school environment is seen as a place that has the responsibility to educate ethical, formal, fair and educated citizens, but this responsibility must belong to everyone, especially the family and the community. society as a whole.
Educational institutions must serve as a mirror of a sustainable society, since it is a highly productive environment for the construction of environmental knowledge, with a conscious dissemination of environmental ideas that lead to attitudes that can positively influence the environment. Environmental content must be integrated into the school curriculum in an interdisciplinary way and in accordance with social realities. Teachers must help students understand the relationship between facts and the world in which they live.

Society is going through a process of constant metamorphosis in the field of technology and its relationship with the environment, with computing being a necessity in people's daily lives, opening paths and opportunities for new developments such as robotics and others. Biotechnology makes people's lives easier, thus changing the work environment, which requires mastery and technical knowledge of these technological means (Matos, 2022).

The history of education shows teachers as the center of all content and knowledge, with chalk and blackboard as tools. However, technological evolution and advances have provided teachers with new pedagogical tools that allow new teaching methods. Furthermore, Peruvian education is still far behind these advances and faces many limitations and obstacles regarding the inclusion of all people in education, especially the most vulnerable.

The objective of the National Curriculum is to guarantee clarity, precision and clarification of what all students should learn in basic education and to provide guidelines for the diversification of the contents established in the National Curriculum throughout Peru that are appropriate for the different regional contexts.

In this context, the National Curriculum seeks to organize teaching in the form of guidelines so that everything from early childhood education to secondary education is clearer than it should be, taking into account the transition periods that are essential for students and supporting learning and impart new knowledge, expand their language, experience and understanding, including in the social, cultural, historical, technological and environmental fields.

In the final years of basic education, students encounter a higher level of complexity in the content taught, which reinforces student autonomy and uses tools to engage young people more effectively, including the use of computer technology, which must be available in the school environment, which involves them and makes them protagonists, but care must be taken to ensure that this technological tool is not abused and that the answers and analysis do not become something superficial, since the objective is to stimulate critical and reflective learning (Morote and Colomer, 2021).

Teachers should use technological tools as a strategy to generate interest, prepare and better develop students on the topics covered, including those related to the environment. As part of the educational model, the goal is to create a better perspective for students about their interaction with the environment. However, to achieve this objective, it is necessary to improve not only the teaching of science and the environment, but also the entire structure, through teacher training, the incorporation of active methods and integrative practices, projects that aim to use technology for the benefit of the educational field to alleviate or solve problems that affect the student's reality (Brias et al., 2022).

Environmental education is currently not inserted in the school environment as it should, this is due to the lack of incentives and training of teachers since educational institutions do not offer real conditions to develop effective work with environmental problems. There is still a great devaluation of poorly paid teachers, which discourages them from working on topics that go beyond basic content. It is necessary for all areas to work comprehensively on environmental education, but there are still many obstacles that prevent this integration (Mejía et al., 2022).

Therefore, when environmental problems are solved, it is done in a very superficial way and with little commitment. Students only learn that conservation is necessary, but in most cases
they are not presented with influential guidelines that help them understand what is needed to consciously protect and use the planet's natural resources (Silverio and Cavalcanti, 2022). Consequently, they become passive listeners rather than active practitioners when motivated by activities and projects in their community and can apply environmental awareness through their own culture and reality (Posso et al., 2022).

It is necessary to provide teachers with adequate professional training, reformulate teaching/learning procedures and methods and focus on practical rationality and criticism of their context. This will give them greater perspective and relevance in the construction of environmental issues aimed at positive change in the school and community environment, pointing out current social and environmental problems and suggesting ways to mitigate or solve the problems that we all face, always emphasizing the importance of environmental problems for human life. In this way, environmental education supports and prepares students for a more mature society and stops the current capitalist model that focuses only on production and consumption (Matos, 2022).

On the other hand, according to Aguilar (2023), the ecosystem can be defined as a set of relationships between living beings and biotic factors, that is, autotrophic beings, which have the ability to fix light energy and produce food from inorganic substances. And heterotrophic beings that use, consume, modify and decompose the most complex materials synthesized by the autotrophic component. The abiotic centers responsible for sustaining the life of ecosystems are interconnected properties such as water, temperature, light, wind and others. Thus, these ecological relationships allow the flow of energy and the cycling of materials between biotic and abiotic organisms.

Munsibay and Cavero (2022), according to the ecological concept of biodiversity, comprises a great diversity of life existing in biomes, which represent particular forms of flora and fauna that contribute to biodiversity. However, biodiversity in Madre de Dios is increasingly threatened by factors such as deforestation and illegal mining.

Students must understand that the anthropogenic causes of biodiversity loss are related to processes that have aggravated the environmental crisis and threatened the survival of the elements that create the environment, such as animals and plants, and have accelerated the imbalance of ecosystems of the region. Examples of these anthropogenic activities are: Destruction of natural habitats due to pollution, introduction of exotic and invasive species, overexploitation of animal and plant species that leads to the extinction of some of them, discriminatory hunting and fishing, trade in wild animals and plants, disorderly development of agricultural lands, human population growth, urbanization and climate change exacerbated by human activities (Laso et al., 2022).

On the other hand, according to Mendonça and Zanon (2023) the urban ecosystem can be characterized as a particular space exposed to possible changes due to major anthropological interventions, resulting in greatly altered models and characteristics compared to the previous reality. The main characteristics of the urban environment are: high population density, disproportionate balance between the built and natural environment, energy consumption to maintain the functioning of urban systems, high waste production, absolutely abundant conversion of the original biodiversity due to the deforestation, elimination of plant and animal species, imbalance of the main biogeochemical cycles such as the water, carbon, nitrogen and phosphorus cycle, and alteration of water flows.

To achieve ecological balance, we must undoubtedly respect nature and be grateful for the numerous natural resources it offers us, such as water, air, fruits, soil, flora and fauna, and many other essential elements (Mejía et al., 2022). For the planet to survive, the unity of all people is necessary to guarantee the continuity of future generations. Education is the most important and best tool to take advantage of and invest in social and environmental change in today's society. The great challenge is to ensure that environmental education reaches
educational institutions and societies with its necessary theory and procedures. Therefore, it is necessary to reevaluate ecological, political, socioeconomic and cultural relationships to create a new, more conscious and ecological society.

According to Morote and Colomer (2021), in recent years society has paid increasing attention to environmental problems, reevaluating economic growth at any cost at an accelerated pace, seeking strategies and alternatives for more sustainable development, taking into account the environmental protection, social and environmental problems, improving the quality of social life. According to Karl Marx, one of the biggest obstacles to a more sustainable society is the current model of capitalism, which favors mass production and high consumption of products and food. It is not just a personal habit, but a great media and social pressure that forces us to live in a vicious circle and requires greater consumption of goods that do not last long.

According to Murcia (2023), the generation of solid waste due to industrial activities is an inevitable part of everyday human life. Therefore, the human species must realize that it needs to change its environment sustainably to survive. Consumption is one of the main factors for the survival of humanity, and the generation of waste takes on a different meaning related to the way in which social relations of production and consumption arise. The socioeconomic and environmental problem is becoming more important with the passage of time due to the increasing amount of waste. The three main reasons for the increase in waste generation in global society are planned obsolescence of goods, excessive consumption with high waste rates, and flexible industrial production.

According to Muñoz et al. (2023), with the growth of the population and the increase in land occupation, there is also a disproportionate increase in the consumption of various items in society, and recycling has become an alternative to protecting and preserving the environment. Through the process, used materials can now be reused, modified and refined to create new products, reducing and mitigating the depletion of raw materials and thus avoiding further damage to natural resources. However, not all materials are suitable for reuse, for example, hospital materials, which pose a great threat to the environment and can seriously contaminate other recyclable products.

Recycling requires a great social effort, which is why it also helps create jobs, is a source of income for some people and thus contributes to protecting and preserving the environment. Waste recycling provides many benefits to society, such as reducing the number and preventing diseases caused by accumulated waste and mitigating the impact they cause on the environment (Reséndiz, 2022).

According to Pérez and Camacho (2023), intense urbanization and the negative impacts of climate change pose great challenges to cities in terms of education for sustainability. These climate changes are present throughout the world and threaten the well-being and lives of this generation and future generations.

According to the report of the Intergovernmental Panel on Climate Change (IPCC), in which there is a section dedicated to urban issues, it is highlighted that climate change processes in cities can cause greater risks for people, property, economies and ecosystems, including the risk of stress from high temperatures, storms, heavy rain, floods, landslides, air pollution, drought, water scarcity and sea level rise. Some of these environmental impacts especially affect populations living in areas without infrastructure or in more vulnerable areas (Schilbert and Scheersoi, 2023).

6 CONCLUSION

It was shown that environmental education workshops significantly influence the construction of a society with values and development of capacities necessary for the
harmonious coexistence of man with his culture and his environment, and towards the protection of the environment, since the p-value associated with the Mann Whitney U statistic (Sig. Asymptotic) is 0.000; This value is less than 0.05, then at the 1% significance level; The total scores are different in both groups after carrying out the environmental education workshops with the students.

Irresponsible and individualistic anthropic attitudes could lead to the extinction of species in the Madre de Dios region and planet Earth in a few years. This study demonstrates how necessary and urgent it is to analyze, reflect and act differently in relation to the environment, with environmental education being the main aspect of this cultural change. The emergence of environmental education is important due to anthropocentrism. Human beings, being at the center of the cycle of nature, routinely alter and destroy the entire environment around them for their own benefit, without caring about the consequences they themselves suffer.

Precisely because of these mistaken and individualistic attitudes in the name of economic development, it is necessary to create laws and environmental organizations that could mitigate this recklessness of human beings towards biodiversity. Education is the most important tool to improve the relationship between humans and the environment. Therefore, environmental education is of great importance, since small regular changes in behavior can cause big changes in the environment and give rise to a new ecological culture in the Madre de Dios region and in the world. Environmental education goes beyond respect and awareness for the environment. These are everyday choices that favor a better society in the future and a different level of social life. Furthermore, a community that is sensitive to the environment avoids the destruction of its own and other species. Regardless of the educational field, the teacher must include environmental topics in the classroom and organize projects and workshops that help students understand their environmental reality and, if possible, integrate these topics into the daily activities of their area.

REFERENCES


Environmental Education Workshops to Mitigate the Environmental Problems in the Region of Madre de Dios – Peru


