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Values Are Not Taught, Values Are Built

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Forming values to contribute to the complete formation of the human being as responsible citizens is an educational task that is indispensable to the construction of sustainability. Consequently, this document states that achieving a construction of values that leads to true development is not possible without a teaching and learning of science that, starting from an intersystemic and therefore complex vision of the world, allows us to build them. Answering the question How can interdisciplinary science teaching contribute to generating in today's children a genuine interest in the study and knowledge of science in general, and in the conservation of natural resources in particular? Was the objective of the methodological proposal for interdisciplinary science teaching that was previously described in the article "Teaching soil science: a strategy and warranty towards the future" (Reyes-Sánchez, 2012). This second document addresses why, how and for what purpose the formation of values and principles accompanied this methodological proposal for interdisciplinary science teaching as a qualitative pedagogical approach that was applied within two schools with children in 5th and 6th grade of basic education –10 and 11 years of age-: by amalgamating the construction of knowledge with that of values to support the appropriation of both in a playful way, seeking and encouraging in children the congruence between knowledge, thought and action. The differences in children's opinions regarding life problems that affect the social, political and economic order before and after the pedagogical intervention are presented in a comparative manner.

Keywords: education, interdisciplinary teaching, values, social responsibility, sustainability

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INTRODUCTION

When UNESCO defined Environmental Education in 1971, it made clear its intrinsic relationship with the construction of environmental awareness and culture, defining it as the "process that consists of recognizing values and clarifying concepts in order to foster the attitudes necessary to understand and appreciate the interrelations between man, his culture and his biophysical environment." In this regard, while it is true that the increase in urbanization of society and its detachment from the food production process means that a significant proportion of the human population lacks a fundamental understanding of what the natural resource soil. An important part of the population do not know what the soil means to society, its functions, the benefits received from it and, where their food comes from. It is also true that if we want to build citizen awareness about the value of soil resources, then we must understand that this is the result of a complex process that begins with our lives within the family and the environment that surrounds us but is forged at school and each teacher leaves a mark on its formation. Therefore, understanding the difference between teaching and educating in order to raise awareness, is of vital importance when it comes to preserving natural resources.

This document presents both the activities that were planned and carried out in this qualitative exploration to address the formation of values that accompanied the construction of knowledge in a playful way. With this in mind, the document also shows the comparative differences that children in the penultimate year of basic education from two different schools (work groups) expressed regarding different values, compared to those expressed by those same children after being pedagogically intervened throughout the school year.

The differences expressed for the same values are contrasted with children for the intact groups from two different schools.

PROPOSAL

Why Teach Soil Science Simultaneously Addressing the Construction of Values?

Science, constituted as a collective and organized body that develops scientific knowledge, is very recent in the context of human history, and over the last centuries the concept and model of science has changed in response to new knowledge, becoming a qualitative and quantitative dialectical construction of the same (Bernal, 1979). The dialectical construction of science as a product of human actions and activities of cognitive construction is transmitted through the educational system; it is therefore educated through teaching and taught at school; this means that, what is taught at school is school science (Reyes-Sánchez, 2012). Science and the teaching of science, which throughout human history has been influenced by the different dominant forms of thought in each era, and in a systematic, conscious and planned way has been and is the educational tool through which; although it seeks to efficiently and effectively transmit the experiences and information accumulated on knowledge, it is also true that through what is taught in the school educational system, it is sought to reproduce a certain culture and finally, the power inherent to that culture. But teaching *is not educating*. Teaching is only a part of educating, but not the same. Educating necessarily involves the explicit and implicit formation of values that emotionally and cognitively root the scientific information transmitted, thus making possible the *progressive formation* of a conscience that in the medium and long term builds, little by little, a culture of preservation (*Ibid.*). *Teaching is only one part of the educational process, since teaching is not the same as learning, and learning is not the same as learning meaningfully.*

Teaching, as an educational learning process, necessarily requires manifesting itself in an integral way, revealing itself through the individual and collective habits and attitudes that have been learned. If learning is not meaningful, then only part of the teaching process was carried out; there is therefore no appropriation[1] of knowledge -significant learning-, since it cannot be expressed or reflected in the daily actions of the citizen (Morales et al., 2011). That is why, in contrast to traditional memoristic education whose social purpose seeks to affirm tradition, the established order and conservatism, for the new school of Celestine Freinet (1949), active education is the full development and elevation of the spirit, not the accumulation of knowledge or domestication, nor the conditioning of the child.

Education and teaching are for Unamuno, "the very action of humanly edifying youth, of making them men, through the search for truth and the passion for it, knowledge and the struggle with oneself; of the spiritual awakening and material prosperity of a country and the mystery surrounding the final destiny of man and his world" (Robert, 1985). From the pedagogical perspective of Anton Makarenko (1959), education must harmonize social interests with the particular interests of students, involving them in the search for solutions to everyday problems. While education, as conceived today by the Freinet Modern School of Pedagogy movement (Legrand, 1993), aims to contribute to the complete formation of the human being through the provision of *knowledges*, *abilities*, *skills*, *values*, *attitudes*, *beliefs* and *ways of acting*.

According to Echeverría (1995), scientific activity is developed in four areas: innovation or discovery, evaluation or justification, teaching and application; and it is precisely in teaching where normative scientific knowledge is consolidated, which each generation considers essential in order for that young people to be able to join a disciplinary group.

That is why, school, being normative and precisely because school is, is also a context of scientific activity.

And What Is Proposed?

Gómez et al (2004), argue that when talking about education, it is necessary to understand that educating for sustainability is an objective that goes beyond a subject, or set of subjects in the curriculum. That it is not about reproducing forms centered on technique, but about teaching science inviting in unison to debate and reflection on the type of technology and social organization that allow people to live in harmony with each other and the natural environment.

All of these conceptualizations and approaches not only allow us to approach from the classroom, the concept of environmental education of UNESCO (1987), as a "permanent process in which individuals and communities become aware of their environment and acquire the knowledge, *values*, skills, experience and will that will allow them to act, individually and collectively, to solve current and future environmental problems;" but they support it and add to the founding premises of the (Belgrade, 1975): raising awareness, acquiring basic knowledge, cultivating attitudes, acquiring skills, fostering critical capacity and promoting citizen participation, to propose *how to build, through teaching, that education that, while fulfilling the objectives described, serves the purpose of educating for development*.

Accordingly, the pedagogical proposal worked on also coincides with the OEI (1995), when it states that values are not innate, they are constructed and therefore, we can consider them as ideals to be achieved, which represent challenges to overcome in everyday life: in each activity we carry out and each

[1]Methodological cognitive process through which the individual manages to make knowledge his own in such a way that he reorganizes it, transforms it, builds new links with practice, and adapts it to the contexts of action and application; in short, he achieves an understanding of concepts of greater complexity (Reyes-Sánchez, 2009).

relationship we establish. Consequently, the need for a change of perspective on how to teach science is assumed and that this is done in the classroom through activities and reflections on the models of action and consumption that allow us to think about assuming new social models of behavior, because pollution, devastation, degradation and loss of natural resources are not problems that can be solved scientifically and technologically with the current predominant values, based on competition, lack of solidarity, uniformity or hierarchization, governed by the market (Novo, 1995; Gutiérrez, 1995; Pardo, 1995; García et al., 2000; Gómez et al., 2004), and fully assumes that the effort of daily work generates added value in terms of training and appropriation.

MATERIALS AND METHODS

The methodological position adopted in relation to the object of study was qualitative for exploratory and interpretive purposes; the sample was made up of intact groups to which a pre-test and post-test were applied to evaluate the expected changes for interpretive purposes. The aim was to start with school groups that were as similar as possible in terms of the variables relevant to the study: age, school year, socioeconomic status, nationality, geographic school and residential area at the municipal level, and sex. Regarding the latter condition, all groups were mixed.

The method was the environmentalization[2] of the knowledge that the children had regarding the soil resource combined with the formulation of moral dilemmas that confronted their values and knowledge through group and individual reflection on the social and economic problems that were directly or indirectly associated with the soil. To do this, the aim of this experience was to conflict their positions through the presentation, argued and propositional discussion of alternatives that represented their personal positions to the moral dilemmas that were presented to them. Personal positions that, when questioned or reinforced by their classmates in the classroom and the moderating intervention of the teacher, could offer normative capacity in the short and long term in the construction of values and principles within the school.

For this purpose, a whole range and sequential program of sessions, content, activities and experiments, discussions, games, exhibitions, events, etc., was developed, which would provide an environment for knowledge of the soil system by interrelating it to the environment system with which it maintains complex intersystemic relationships; always seeking to integrate the various disciplines of the school curriculum with respect to their social, economic, political and cultural perspectives, and at the same time to conflict their knowledge through moral dilemmas assumed from those same perspectives.

[2]A methodological process that approaches the environmental problems in a cognitive and interdisciplinary way through education and the practice of science with the objective of building a preservation culture and conscience by providing models for the management and exploitation of natural resources towards the development for all (Reyes-Sánchez, 2009).

The application of the proposal was carried out through direct pedagogical intervention to intact groups in two schools in Cuautitlán Izcalli, Mexico, and the evaluation instruments were subjected to both frontal validity and expert judgment. The proposal was applied to the entire sample when the children were in the 5th year of basic education and the post-test was applied when the children finished the 6th year of basic education (8 months later), with the objective that their responses corresponded to a long-term appropriation (Ausubel, 1973).

> "*Liven up teaching with the beautiful word, with the appropriate anecdote, and the relationship of each knowledge with life*"
>
> Gabriela Mistral.

The hypothesis underlying this proposal is that it is possible to promote a normative action based on a constructive teaching of science. To achieve that the aim was to simultaneously address both the interdisciplinary knowledge of the soil system and the normative perspective of that knowledge. For this purpose, discussion and work dynamics were developed that would lead to reflection and encourage in children the formation of values, principles and attitudes related to the construction of sustainable development.

It is exemplified by the three phases of a moral dilemma worked on during this pedagogical intervention and the arguments offered to the children to develop this experience are described.

The Limits of Growth That Nature Imposes

Assuming the existence of the limits of growth that nature imposes on us (Meadows, 1977), orienting knowledge, values and behaviors towards sustainable patterns for consumption and management of resources as a necessity in the construction of development was one of the topics considered essential. Regarding how to bring the topic to the classroom through a didactic transposition that contemplated interdisciplinary integration from various fields of knowledge, it was proposed to carry out a set of activities to be carried out during three consecutive work sessions (for 3 weeks). The subjects of the basic curriculum that were sought to be incorporated were mathematics, history, geography, natural sciences and their social connection.

The objectives to be incorporated in relation to knowledge of the soil resource for discussion with the children were: a) Understand that not all soils are fertile for food production, b) Understand that the surface of fertile soil is small, and it can be easily lost and c) Promote the formation of a critical and respectful awareness of the environment.

How Much Soil do We Have to Produce Our Food?

The children participate in the discussion and calculate on each occasion the fractions that occupy water and land in the planet, as well as each of the fractions corresponding to the different areas covered by soil, while the teacher begins the following conversation with the pedagogical intention of appropriating knowledge and reflecting on the value of the soil resource and what its loss means.

Approach: Knowing that ¾ parts of Planet Earth are water and only ¼ is made up of solid land, the students are shown graphically using an apple or an orange as a model, what real fraction is the one that makes up the areas in which we live and what its fragility is (the apple is cut and the only quarter that corresponds to solid land is shown to them). Of the remaining fraction: ¼, not all of it is habitable, large extensions make up deserts, mangroves, rocky soils and high mountain soils where we cannot plant due to their steep slopes, and where, on the contrary, if the soil does not have a vegetal cover, the water drags that soil that is thus lost from those areas, eroding them. This means that only approximately half of the quarter that constitutes the solid plates is habitable for man, (the children are asked to do the mathematical calculation) that is, 1/8 of the total of the Planet.

Part of this eighth fraction is occupied by large and small cities that therefore cover the soil with concrete, which makes that soil no longer cultivable. On the other hand, if we think that the eighth part of the Planet that is habitable, it is divided into at least another four, then.

- 1/32 would be covered by concrete by the large and small cities where we live and the roads that connect them.
- 1/32 is made up of areas with slopes too steep to be used for the production of our food.
- 1/32 has very poor soils and therefore cannot be used for agricultural production. How much fertile soil would we have left? (The apple is cut graphically showing all the fractions).

Only 1/32 of the solid plate would be covered by fertile soil and therefore could be cultivated, only 1/32!

On the other hand, the world population has grown so much and is so disrespectful of the environment that it does not always properly use that eighth part of the Earth that is more habitable; Thus, for example, in the area where we live, over the last 50 years, the fertile soils of the Cuautitlán Valley have been covered each year in greater proportion by the asphalt layer that now covers the City of Cuautitlán Izcalli. This has also changed the economic activities of its original inhabitants and made their lives more expensive as the city and its population grow, given that now, families have to buy fruits and vegetables that are brought from far away, and that were previously produced in the surrounding area. Those who owned those lands, by selling their land to the construction companies, were left without fertile land on which to work and now have to look for work that is mostly found in Mexico City, which means they have to move. To do so, they spend 3 or 4 h/day that steal from their sleep and from their family, they get more tired, they use transportation that is expensive and that pollutes the air we breathe.

Reflection: Are we adequately planning our future life on Earth?

Task: Search the school library and/or the Web for information about how long it takes for soil to form.

How Is the Earth Made Up?

For this second part, we will go back to what we have done in the previous class, using an apple or an orange as didactic models that represent The Earth.

Children explain how the Earth is made up, what its different layers are, what is in its core, etc. The last layer of the planet, that is, the lithosphere, contains the soil that has been formed over millions of years, and only 1/32 of this lithosphere is covered by fertile soil. What is the size of this layer of soil that covers the lithosphere? The layer of soil that covers the lithosphere is as thin as the shell of our educational model: extremely thin and therefore fragile! Very easy to lose.

On the last layer of the planet - that is, on the lithosphere - is deposited the soil that has been formed over millions of years, and only 1/32 of this lithosphere is covered by fertile soil. What is the dimension of this layer of soil that covers the lithosphere? The layer of soil that covers the lithosphere is as thin as the shell of our educational model: extremely thin and therefore fragile! Very easy to lose.

Only about 1/32 of the habitable part of the planet has fertile soil, and the life of all living beings on the planet depends on the existence of this fertile soil to produce their food. However, we continue to cover part of this fertile soil with asphalt to accommodate an ever-growing population; We are losing another part of this fertile soil, because when we deforest, the water and air take with them the fertile soil that we need to produce our food. We also contaminate it with large quantities of agrochemicals and accelerate its degradation.

Activity: Search for information to answer the following questions: How many tons of fertile soil are lost per year in Mexico and in the world? How many hectares of vegetation are lost per year and for what reasons?

Reflection: Let us think again about our previous activities, discussions and conclusions: Are we, the inhabitants of the Earth, planning our lives adequately?

Homework: Search in the school library and/or on the Web for information about the time it takes for soil to form.

How Long Does it Take for Soil to Form?

The books say that, on average, 1 cm of soil is formed in 300 years. No man can live to wait for the 30 cm required to plant our vegetables to form!

During this session, we will work on how soil was formed through the action of weathering agents and from the environment on the Earth's crust (weathering), and what factors intervened in this.

Experiment: To understand the action of these agents on the Earth's crust, we will carry out a didactic experiment using three eggs as a model; each one is immersed in a glass filled halfway with: plain water in one, vinegar and lemon juice in the other two. What happens to the eggshells of eggs immersed in these three different media over time if we observe them for 5 days in a row? The observations are discussed in class.

Activity: Let us suppose that each centimeter of fertile soil that is lost took at least 300 years to form; if to grow the vegetables that you have on your school plot we need 30 cm of fertile soil, how many years did it take to form those 30 cm on which we grow today at your school?

Reflection: If we are all part of the same food chain, will we be able to survive as a species if we continue to lose fertile soil? Will

TABLE 1 | Pre and post-concepts of children from the "Professor Alfonso Sánchez García" Institute and the "Leyes de Reforma" School.

Values and attitudes		Institute Sánchez García	Inst. Sánchez García	Leyes de Reforma school	Leyes de Reforma school
		Final	Initial	Final	Initial
		6° (18)	5° (19)	6° (15)	5° (13)
Problem 1	Rosa's grandmother has been sick for several months and sometimes the family cannot go out for walks because they have to stay home to take care of her	% of answers	% of answers	% of answers	% of answers
The reasonable thing would be to put her in a nursing home		5.55	0	0	7.69
Family should come to an agreement with other relatives to take turns caring for her		50.00	10.52	60.00	30.76
We all have to look after the elderly, because they looked after us and fed us when we were children		0	0	40.00	61.53
Grandparents should be self-sufficient and see how they can manage on their own		44.44	89.47	0	0
Problem 2	At most bus stops, benches with roofs were placed so that passengers could wait comfortably, without getting sunburned or wet; however, the vast majority of them were destroyed by the young people of the city	11.11% did not answer	26.31% did not answer	All answered	All answered
They are right to destroy them, because that is how they express their discontent with the conditions in which they live		0	5.26	6.66	38.46
That is not the way to solve or express themselves about the problems that exist, nor does it contribute to improving the living conditions of the community		88.88	68.42	60.00	30.76
Those who do so should be imprisoned		0	0	26.66	30.76
That does not affect me		0	0	6.66	0

any species be able to wait for the next 30 cm of soil to form? We will share everyone's opinions in the next class.

REMARKS

In this work, although the aim was to encourage children to have congruence between knowledge, thoughts and actions, the different responses were not evaluated in order to assign them any kind of grade. On the contrary, it was considered that respect for the diversity of thought regarding the knowledge of individuals is an element of life and not of repetition or memory. Their opinions regarding life problems that affect the social, political and economic order in relation to the land resource before and after the intervention are presented in a comparative way.

Tables 1–**4** present the differences in the values that the children assumed in the face of the moral dilemmas posed in order to detect signs of change in their values after the pedagogical intervention, not generating value judgments in this regard but looking for signs of change in their values with respect to those they have been expressed in writing before the intervention.

Under the hypothetical assumption that it is possible to promote a normative action from a constructive teaching of science, after having worked on the cognitive part and addressing the normative through the presentation of moral dilemmas, search for information, brainstorming, collective discussions and homework, the analysis of the children's reflections that correspond to their answers, generally reveals some change in the direction indicated below for each of the problems raised:

1. Greater equity in the distribution of tasks at the family level on how to care for the elderly.
2. More reasonable and less aggressive positions in the face of current violence.
3. Greater commitment and involvement in the face of pollution problems.
4. They seek to be equitable without achieving it when they assume that water should be rationed equally for everyone, because in reality that is inequitable, and the real way to be fair in this regard would be charging more to those who have more and spend more.
5. Greater recognition of the value of the soil resource, based on the differentiation of its use.
6. They failed to understand the real meaning of the loss of agricultural soil for their lives.
7. They are seeking more equitable measures.
8. There has been progress in understanding the problems of the countryside and the lack of government support for farmers is clear to them.

TABLE 2 | Pre and post-concepts of children from the "Professor Alfonso Sánchez García" Institute and the "Leyes de Reforma" School.

Values and attitudes		Institute Sánchez García	Inst. Sánchez García	Leyes de Reforma school	Leyes de Reforma school
		Final	Initial	Final	Initial
		6° (18)	5° (19)	6° (15)	5° (13)
Problem 3	Water in Mexico's lakes and rivers is dirty and contaminated	16.66% did not answer	All answered	All answered	All answered
This is everyone's responsibility		11.11%	31.57%	40.00%	46.15%
The responsibility lies with the companies that pollute it		0	15.78%	13.33%	23.07%
The responsibility lies with the government that does not enforce the rules		0	0	13.33	23.07
We all need to take responsibility for this and take real action to conserve it		72.22%	56.63%	33.33%	7.69%
Problem 4	There is not enough water in urban areas to cover the total demand of the population, which is why	16.66% did not answer	10.52% did not answer	All answered	7.69% did not answer
Water should be rationed equally for everyone		66.66%	52.63%	66.66%	53.84%
Water should be given only to those who can afford it		0	5.26%	0	7.69%
More should be charged to those who can afford it, but everyone should have access to it		16.66%	5.26%	6.66%	15.38%
Its price should be raised so that people do not waste it, even if not everyone can afford it		0	26.31%	26.66%	15.38%
Problem 5	The soil resource	16.66% did not answer	5.26% did not answer	All answered	All answered
It is the same everywhere in the world		11.11%	21.05%	26.66%	7.69%
It can be used for any activity		5.55%	10.52%	6.66%	46.15%
It is not indispensable for human life		5.55%	5.26%	6.66%	7.69%
Soils useful for agriculture should be more valuable than others and should be preserved for that purpose		61.11%	57.89%	60.00%	38.46%

TABLE 3 | Pre and post-concepts of children from the "Professor Alfonso Sánchez García" Institute and the "Leyes de Reforma" School.

Values and attitudes		Institute Sánchez-García	Inst. Sánchez García	Leyes de Reforma school	Leyes de Reforma school
		Final	Initial	Final	Initial
		6° (18)	5° (19)	6° (15)	5° (13)
Problem 6	The loss of fertile soil for agricultura	16.66% did not answer	5.26% did not answer	All answered	All answered
It is a problem that can easily be solved by specialists		5.55%	0	6.66%	23.07%
It is the responsibility of the whole society, and it must take preventive and recovery measures in this regard		5.55%	0	6.66	23.07%
It does not affect us because we can continue buying food from Americans		0	0	13.33%	15.38%
It is not important because Mexico has a lot of territory and we can plant in other soils		77.77	94.74%	6.66%	7.69%
Problem 7	The profits from the food produced by the farmers	27.77% did not answer	5.26% did not answer	All answered	All answered
Should be for them so that they do not abandon their lands		5.55%	21.05%	33.33%	15.38%
It is correct that they should be mostly for the transporters because they bring them to the cities		0	0	33.33%	53.84%
Should be distributed according to the work and effort made by each one of them		66.66%	73.68%	26.66%	30.76%
Should be for the business owners because they are the ones who buy them to resell them		0	0	6.66%	0

TABLE 4 | Pre and post-concepts of children from the "Professor Alfonso Sánchez García" Institute and the "Leyes de Reforma" School.

Values and attitudes		Institute Sánchez García	Inst. Sánchez García	Leyes de Reforma school	Leyes de Reforma school
		Final	Initial	Final	Initial
		6° (18)	5° (19)	6° (15)	5° (13)
Problem 8	The peasants who abandon their lands and go to the U.S. as braceros	11.11% did not answer	5.26% did not answer	All answered	15.38% no contestó
They leave because the government does not support them		0	0	13.33%	30.76%
They leave because there is no work in Mexico, and we do not pay them fairly for their work		88.88%	89.47%	40.00%	30.76%
They leave because we prefer to buy foreign products instead of paying them fairly for their work					
They leave because they like to earn a lot of money		0	5.26%	13.33%	15.38%
Problem 9	Lupita's aunt bought some plastic shoes made in China, which were cheaper than the leather shoes made in Mexico	33.33% did not answer	All answered	All answered	15.38% did not answer
She made a good purchase because they were cheaper		0	0	0	46.15
She did not make a good purchase because they are made of plastic and break more quickly		5.55%	10.52%	33.33%	15.38%
Even if the shoes made in Mexico were more expensive, she should have bought them, because by doing so she is helping other Mexicans keep their jobs		61.11%	78.94%	46.65%	15.38%
The only important thing is that she spent less		0	10.52%	20.00%	7.69%

9. There has been progress in understanding the economic problem of the market, but not enough; at least they are already reflecting on it.

It is significantly important to note that in the face of reflections that involve expressing their values, there were several questions in which the children simply abstained from expressing their opinion. The abstentions ranged from 5.26% to 33.33%, which affects the interpretation.

However, progress is perceived in 1) their reasoning in terms of conceptualizing the environment no longer as a stage, but as the environment in which they and other living beings develop. 2) they show a greater degree of responsibility when in their answers they indicate that it is they - and not only the government - who must demand that companies respect the environment, and they assume that part of the care that must be taken of it is their responsibility.

CONCLUDING STATEMENTS

Education for sustainability does not require the accumulation of a set of memorized concepts and knowledge. On the contrary, it is proposed that the challenge is to appropriate universal knowledge from broad epistemological perspectives, build collective values and principles, consolidate competencies to select them, reorganize them, transform them and build new links with practice, adapting them to the contexts of action at each moment and that the effort of daily work generates added value in terms of training and appropriation for students and teachers.

The change of beliefs, principles and values is more difficult to achieve than any change in statements or legislation, and only education for sustainability throughout the planet and from an early age can achieve the changes required to preserve natural resources and achieve the SDGs (Reyes-Sánchez, 2024).

Forming values to contribute to the integral development of human beings is an essential educational task for building sustainability, which is why it is necessary for both the school to work on its active formation and for the family to also collaborate to provide the knowledge and values that achieve a change in attitudes and beliefs that are reflected in ways of acting that allow preserving life on Earth.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

Like all educational research, this was conducted with students with the knowledge and participation of both children and schools and with the approval of both schools involved, which were aware of the fact that the children and their teachers were worked with for an entire

school year. No specific ethical approval or consent procedures were required for this study. Acknowledgements to the children, teachers, and schools were also included in DOI: 10.3232/SJSS.2012.V2.N1.07.

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LR-S is first authorship. She conducted conceptualization; research; formal analysis; data curation; original draft writing and editing.

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CONFLICT OF INTEREST

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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