Experts’ Perceptions on Environmental Education for Sustainability in México

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Abstract

When environmental education for sustainability is confined to the classroom, it becomes a privilege for some. The environment-home-school link in Mexico is a long-term attainable goal that implies the government’s and society’s participation. To confirm these and other assumptions, we administered a survey to 35 experts from the membership of the National Academy of Environmental Sciences (Academia Nacional de Ciencias Ambientales). 80% of them perceived that we were not moving towards sustainability; 97% considered that environmental education for sustainability is fundamental and useful; and 77% said that it has to be permanent, since childhood and for everybody. Non formal environmental education for sustainability is of the utmost importance and utility to build sustainability.

Keywords: Environmental culture for sustainability, family, developing countries, society and environmental values.

INTRODUCTION

The gigantic task of solving environmental problems to prevent the growing deterioration of planet Earth, the only available habitat for human life as of today should be everybody’s business. Overcoming the current indifference and thinking about the future is a priority. If the world is to remain a supportive habitat for humans and other species, our commitment to future generations should be to leave them enough natural resources so they can cover their needs. Preventing the planet’s deterioration will avoid the need for us to explain to our descendants why we left them the burden of paying for the consequences of our actions (Ban Ki-moon, 2007).

The aim of safeguarding the right for a healthy environment for current and future generations is a global task and a complex challenge for mankind. In order to participate efficiently, we need to learn about environmental and sustainability issues
as individuals and as societies. From this perspective, environmental education (EE) is essential when it comes to building sustainable development (SD).

At a global level, we have to find the way to sustainability through the current base of that knowledge that contemplates sustainable alternatives from a tripartite perspective—social, economic and environmental. The need to find timely solutions for a better future is a goal that implies “creating new paths” to lead us there; but for us to achieve this purpose, implementing education for sustainable development (ESD) for all becomes essential (COMPLEXUS, 2015).

Since the First World Climate Conference in 1979 until the Earth Summit held in Rio de Janeiro in 1992, and then again in 2012 as Rio +20, the great challenge has been to insist on keeping on with the efforts that have been carried out globally in a more planned and structured way.

Considering that the impact on the environment depends on three main factors: population, affluence (consumption) and technology, what is known as the Ehrlich or IPAT equation (Ehrlich and Holdren, 1972), all efforts to protect the environment, as insignificant or insufficient as they might seem, should be maintained though at a greater size and speed. To succeed in this overwhelming task, people’s participation at global, regional and local level is essential.

As a lifelong-learning process, EE is the alternative to enable all human beings to awake to environmental awareness, to change attitudes, to acquire ethical values, and to be able to make personal commitments for generating sustainable behaviors, to favor the rational use of resources, to protect the environment and to mitigate its damage (UNESCO, 2004; Macedo and Salgado, 2007).

In developed countries such as Finland, Iceland, Sweden and Denmark environmental culture became a direct product of their legislations after the Tbilisi Declaration (UNESCO, 1977) that together with two of the recommendations of the Conference constituted the framework, principles, and guidelines for environmental education at all levels—local, national, regional, and international—and for all age groups both inside and outside the formal school system. Governmental and non-governmental programs and public environmental policies were, by law, intentionally designed to educate citizens for sustainability. In developed countries, the government has two throughout-life sources to influence culture for its inhabitants: a) the observance and enforcement of law, and b) the fact that environmental education is mainly formal (taught at school) and informal (addressed to all inhabitants, through public policies) (EPI, 2016).

Compared to what happens in developed countries, EE in those countries still in development, is basically formal and does not have the sufficient coverage that is needed to build a country’s culture for sustainability among its entire population, which is precisely what needs to be done in Mexico, the country of our concern. In México, this building process takes place only during the academic formation of individuals, while they are attending school. That is, EE is limited in time and space and measured by years of school attendance (Coombs and Ahmed, 1975).
By stating that EE is essential for the creation of an environmental culture and values to systemically (or holistically) permeate a country's population from a first level, we are assuming that the process of cultural transformation necessarily begins at the basic structure of social life: the family cell, and from there it continues its way through the different external spheres of social structure, such as school.

EE institutionally started in Mexico in 1983, with the creation of the Environmental Education Directorate of the former Urban Development and Ecology Secretariat (Secretaría de Desarrollo Urbano y Ecología) (Reyes and Bravo, 2008). However, it took more than two decades for its inclusion at the secondary level to be formalized at national level, when the Agreement 384 of the Public Education Secretariat (Secretaría de Educación Pública) was published on May 26, 2006 (Calixto, 2015; Diario Oficial de la Federación, 2006).

Referring to the delay in the inclusion of EE in Mexico, González et al. pointed out that there were lags and distortions that had to be addressed. Later, Reyes and Bravo affirmed that there was certain evidence that showed some growth in relation with EE consolidation within the framework of the National Educational System. The reality is that, in terms of Education for Sustainable Development (ESD), the lags and distortions remain without significant changes and they are still not sufficiently addressed and that which has been consolidated remains insufficient.

In terms of environmental legislation, education and government plans and programs, Mexico's commitment to environmental issues and to SD is a fact. Nevertheless, the country's economic growth, as was suggested in the National Development Plan 2013-2018 of the Federal Government, remains closely linked to the emission of greenhouse compounds, excessive generation of solid waste and pollutants into the atmosphere, to untreated wastewater and to the alarming loss of forests and jungles.

EE’s concerns are not only upon environmental issues. EE has a lot to do with the striving to balance these with those social and economic issues. The transcendence of EE for all is not only because Mexico is a multicultural country, but because it is one of the main world megadiverse countries of a selected group of nations that possess the greatest number and diversity of animals and plants. With around 200,000 different species, Mexico is home to the 10 to 12 percent of the world's biodiversity (SRE, 2013). Here is the urgent need for us to understand where the environmental problematic lies; we must clearly understand what responsibilities are of our concern, as part of the social sector, for us to be able to establish new human interactions (Calixto, 2012).

Establishing new modes of human interaction means having to overcome the great deficiencies and poverty of Mexico’s formal environmental education (FEE); at all its educational levels; situations and conditions that were pointed out by Montaño (2012), who criticized teachers for not being able to interest their students in the subject.

Furthermore, there are other symptoms that should detonate the warning signal to the government and society, as they are the two parties that share the responsibility of the
environment’s well-being: Mexican families lack of serious and permanent guidance on environmental issues; mass media play a weak role in the process of environmental communication; Mexican society is not sufficiently involved in environmental matters; and, scholars distract themselves by discussing theoretical and semantic questions that are not translated into effective actions or progress in the environmental field.

Philip et al. (2016), from the Bertelsmann Foundation based in Germany, in their Mexico Report Sustainable Governance Indicators 2016, qualified our country as a leading player on environmental policy in the region, but without any concrete achievements or significant progress, for it is a country in which the observance and enforcement of the law has no priority and institutional programs are inefficiently implemented. Based on their indicators of sustainable governance, they recognized and described in detail that, facing environmental challenges, the level of public awareness had increased, particularly in the youth stratum, but that public pressure and support for non-governmental organizations remained weak – compared to many other member countries of the Organization for Economic Co-operation and Development (OECD). They considered that business interests had priority over the environmental interest.

Calixto and Herrera (2010) indicated that EE requires information generated by research in different fields of study. They pointed out that the study of perceptions on EE was necessary when elaborating proposals aimed to respond to educational demands in order to achieve sustainability, for perceptions lead stimuli to action and determine individuals’ response to any change or difference in the environment. These authors also suggest that exploring environmental perceptions, as a result of the need to function in a given environment and meet the demands or problems of life, provide relevant information to EE, for one of the main functions of environmental perceptions is to direct and regulate the various activities that constitute the daily life of the individual.

In search of relevant and reliable information about the status of EE in Mexico, a survey on environmental perceptions was applied to a group of 35 experts from the (Mexican) National Academy of Environmental Sciences (Asociación Nacional de Ciencias Ambientales ‹ANCA›, for its name in Spanish).

The purpose of this survey was to investigate about their perceptions and interpretations on the different environmental issues in Mexico and also about some main specifics on EE. The importance and pertinence of knowing the experts on environmental sciences’ perceptions derives from the fact that they teach EE in universities; they do research and are in charge of designing educational programs and proposals for action for the process of building ESD in universities.

Collected data were used to design the foundations of the program ‘Environmental culture for the family’, a non-formal environmental education model for adults, aimed to generate environmental behaviors in the family. It was through this educational intervention that has already been piloted with three different groups of parents, how the lack of an effective environmental-home-school linkage in Mexico is still a goal to
be reached. Hence, to pretend otherwise is a fallacy (De la Llata-López et. al, 2017).

Nieto-Caraveo (2007) pointed out that it was really urgent to strengthen EE without any delay. Her recommendation remains a pending task, and there is no way to guarantee that previous or current generations of parents know the basics of ESD.

**STUDY AREA**

For this mixed methods research, descriptive in nature, we chose to integrate a convenience sample of 35 participants from the group of experts of the National Academy of Environmental Sciences, in Mexico – 22 men (63%) and 13 (37%) women, distributed in 20 working centers located in 13 Mexican states and two in Ecuador (Table 1) – who willingly accepted to answer the survey when they were asked to. A research questionnaire was administered to them during the celebration of their XV International Congress and XXI National Congress of Environmental Sciences that took place in Xoxocotlán, Oaxaca, México, from June 15 to 18, 2016.

**Table 1.** Work centers where surveyed experts work and their locations.

<table>
<thead>
<tr>
<th>Name of educational institutions</th>
<th>Location State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Benemérita Universidad Autónoma de Puebla</td>
<td>Puebla</td>
</tr>
<tr>
<td>2. Centro de Investigaciones Biológicas del Noroeste, S.C</td>
<td>Baja California Sur</td>
</tr>
<tr>
<td>3. Colegio de la Frontera Norte</td>
<td>Nuevo León</td>
</tr>
<tr>
<td>4. Instituto Tecnológico de Acapulco</td>
<td>Guerrero</td>
</tr>
<tr>
<td>5. Multiversidad Mundo Real Edgar Morín</td>
<td>Estado de México</td>
</tr>
<tr>
<td>6. Universidad Autónoma de Baja California</td>
<td>Baja California</td>
</tr>
<tr>
<td>7. Universidad Autónoma de Baja California Sur</td>
<td>Baja California Sur</td>
</tr>
<tr>
<td>8. Universidad Autónoma de Guerrero</td>
<td>Guerrero</td>
</tr>
<tr>
<td>9. Universidad Autónoma del Estado de Hidalgo</td>
<td>Hidalgo</td>
</tr>
<tr>
<td>10. Universidad Autónoma del Estado de México</td>
<td>Estado de México</td>
</tr>
<tr>
<td>11. Universidad Autónoma Indígena de México</td>
<td>Sinaloa</td>
</tr>
<tr>
<td>12. Universidad Autónoma de Querétaro</td>
<td>Querétaro</td>
</tr>
<tr>
<td>13. Universidad Autónoma de Tamaulipas</td>
<td>Tamaulipas</td>
</tr>
<tr>
<td>14. Universidad Autónoma de Zacatecas</td>
<td>Zacatecas</td>
</tr>
<tr>
<td>15. Universidad de Guadalajara</td>
<td>Jalisco</td>
</tr>
<tr>
<td>16. Universidad de Occidente</td>
<td>Sinaloa</td>
</tr>
<tr>
<td>17. Universidad del Noroeste</td>
<td>Baja California Sur</td>
</tr>
<tr>
<td>18. Universidad Nacional Autónoma de México</td>
<td>Ciudad de México</td>
</tr>
<tr>
<td>In Ecuador:</td>
<td>Providence</td>
</tr>
<tr>
<td>19. Universidad Tecnológica Equinoccial</td>
<td>Pichincha</td>
</tr>
<tr>
<td>20. Iglesia Católica Anglicana del Ecuador</td>
<td></td>
</tr>
</tbody>
</table>
EXPERTS’ PROFILE

Of the group of 22 male experts, 20 were Mexican, 1 Ecuadorian (Vicar of the Anglican Catholic Church of Ecuador, student of Global Bioethics, at the Multiversidad Mundo Real Edgar in the State of Mexico) and 1 American (residing in Mexico, research professor in the Universidad Autónoma del Estado de Hidalgo). Their ages ranged from 33 to 65 years, with an average of 52 years.

Nineteen said they have a Doctor of Philosophy Degree and three a Master’s Degree.

In the case of the 13 female expert participants, 12 said they were Mexican and 1 Ecuadorian (student of Global Bioethics at the Multiversidad Mundo Real Edgar in the State of Mexico and professor at the Universidad Tecnológica Equinoccial, in Ecuador). Their ages ranged from 37 to 63 years, representing 53.5 years on average.

About their education, one said she has a postdoctoral degree, ten said they a Doctor of Philosophy Degree and two a Master’s Degree.

Regarding work roles, summarized in Table 2, the data show two meaningful differences among this group of thirty-five researchers and professors: on the one hand, more female experts (6 = 46%) than male experts (3 = 14%), do research, but on the other hand, more male experts (13 = 37%) than female experts (4 =11%), are dedicated to teaching.

<table>
<thead>
<tr>
<th>Role</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Graduate Director</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Post Graduate Coordinator</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Vicar and Doctoral Student</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Career Director</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Academic Secretary</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Researcher And Adviser</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Retired Researcher</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Research Professor</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Researcher and Doctoral Student</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Full-Time Researcher</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Professor</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total sample = 35 experts</strong></td>
<td>22</td>
<td>13</td>
</tr>
</tbody>
</table>

MATERIALS

The research questionnaire was designed to measure the experts’ perceptions on EE and their points of view in related issues on culture for sustainability and environmental values of the people of Mexico. It consisted of 30 items, distributed in three sections:

- Ten multiple choice Likert-scale type, with four response options to force
participants to take sides with respect to their perceptions about the level of 
ESD in Mexico’s population, if any.

- A list of 15 items for them to assign a score to hierarchize from greater to less 
the possibility of solving the environmental problems of the country.

- Five open questions to learn what they thought about the level of ESD that 
prevails among Mexicans.

METHOD

The method of analysis of descriptive quantitative data was used to summarize and 
describe the data’s measures. For this purpose, we determined three variables (one for 
each part of the questionnaire):

- Part I. Variable I. Perceptions on the level of culture for sustainability in Mexico.

Responses to this variable were measured by using a descriptive statistics of central 
tendency: the mode.

- Part II. Variable II. Order, (where 1 is greater than 15), in which environmental 
problems that prevail in the country from greater to less possibility could be solved.

To compute the score items from ‘a’ to ‘n’ (the fourteen environmental problems that 
were enlisted), we added up all the values. The item with the lowest score was the 
environmental problem that experts considered to have the most possibilities to be 
solved and the higher the score the less it could be solved.

Item 15 where they could suggest any other environmental problem was computed 
separately. Only ten suggestions were received and they were all different. Later on, 
in the results section, we present a table with these data.

- Part III. Variable III. Opinions on what ESD should be like in Mexico.

To measure the 5 open-ended questions of this part of the questionnaire, we made the 
transcript of all the answers given by the participants, analyzed the content of each 
one and made a word-category list with those patterns (nouns, adjectives, adverbs and 
other concepts or terms) and their synonyms with the highest frequency of mention.

RESULTS

Variable I measurements: Perceptions on the level of culture for sustainability in Mexico.

For this first part of the survey, on the level of culture for sustainability in Mexico 
(Variable I), to find the mode all data were ordered in a matrix.

From item 1 to 9, the mode was "Disagree". In item 10, response options – “Agree” 
and “Disagree” – occurred 13 times each; so, in order to determine the general trend, 
the repetitions from each opposite end – “Strongly disagree”, 6 times and “Strongly
agree”, 3 times – were added, too. The general trend was in favor of those who disagreed/strongly disagreed (Table 3).

**Table 3.** Mode figure for items 1 to 10 on perceptions on the level of culture for sustainability in Mexico.

<table>
<thead>
<tr>
<th>Items / Response options /Number of repetitions</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>Total of answers by item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Mexican society, broadly speaking, has basic and sufficient knowledge to move towards the Culture for Sustainability that public policies of the Government of Mexico proposes and promotes.</td>
<td>1</td>
<td>6</td>
<td>22</td>
<td>6</td>
<td>35</td>
</tr>
<tr>
<td>2 Mexico's public policies are gaining strength and achieving the purpose of inspiring and encouraging us - citizens and residents - to adopt sustainable habits, behaviors, skills and attitudes at personal, family and community levels for the benefit of the planet, our peers and ourselves, with increasing efficiency.</td>
<td>1</td>
<td>7</td>
<td>20</td>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td>3 Since the Decade of Education for Sustainable Development (2004-2015), Mexicans have already made the care and conservation of the planet their own.</td>
<td>1</td>
<td>4</td>
<td>24</td>
<td>6</td>
<td>35</td>
</tr>
<tr>
<td>4 As far as Culture for Sustainability is concerned, Mexicans' environmental behavior is rapidly improving, in terms of being no longer part of the environmental problem but taking care of being part of the solution, instead.</td>
<td>1</td>
<td>5</td>
<td>19</td>
<td>10</td>
<td>35</td>
</tr>
</tbody>
</table>
5 We have clearly defined how each one of us, as an inhabitant of a megadiverse country, can contribute to minimize our own ecological footprint as human beings in the 21st Century.

6. The government promotes the efficient management of Mexico’s natural resources and ecosystems, and the society understands the importance of preserving the country’s biodiversity.

7 The Mexican government has made great efforts and large investments in strategic programs of environmental culture for sustainability calling on society to adopt and practice pro-environmental values.

8 The Mexican society, in general, has clearly identified the environmental impact that purchase and consumption habits and municipal solid waste management generate, inside and outside the house.

9 As a result of the strength and influence that emerge from public policies, the Mexican indifference towards environmental deterioration has been replaced by a social activism, in favor of a “Green Society”.

10 Widespread beliefs of the Mexican society are that every one of us is needed when it comes to mitigate the deterioration of the planet and, that all our contributions and sustainable behaviors are cumulative and are part of the whole that is needed to protect our habitat.
In sum, thirty experts disagreed or strongly disagreed that the Decade of Education for Sustainable Development 2004-2015 had a significant impact on the population and that the care and conservation of the planet remains a foreign topic for Mexicans; and, that despite living in a megadiverse country, people ignore what an ecological footprint is, let alone know how to minimize it. Twenty-eight experts disagreed or strongly disagreed that Mexico is moving towards sustainability; and, that both government and society are sufficiently involved in the practice of efficient-natural-resource management methods. While twenty-nine experts pointed out that the efforts and investments made by the Mexican government in ESD’ strategic programs have not achieved enough success, for most of the population lacks: environmental values, sustainable attitudes and behaviors; and the same number of experts said that Mexicans intentions to become part of the solution instead of being part of the environmental problem did not show any significant improvement.

**Variable II measurements: Order from greater to less possibility (where 1 is greater than 15) in which the environmental problems that prevail in the country could be solved**

Regarding the order in which they believed the enlisted fourteen environmental problems in the questionnaire (Variable II) could be solved from greater to lesser possibilities, thirty-two numerical order lists were concentrated in a matrix –three experts left this part unanswered. Each problem’s final score was counted. The item with the lowest score was the environmental problem that experts considered to have the greater possibilities to be solved and the higher the score the lesser it could be solved, for the position (or value) with the most possibilities to be solved they could assign to a problem was number 1.

Item 15 where they could suggest any other environmental problem was computed separately, because only ten suggestions were received and they were all different.

Table 4 shows that among the environmental problems that prevail throughout the country, those with the greatest possibilities of being addressed to be solved, according to the experts’ in the first place is deforestation; water is the second place and the third one is pollution. They suggest that the next problems in line that can be solved are related to the urgent demand to cover and satisfy the needs of food, public services and housing inherent to overpopulation, land use change and urban growth.
Table 4. Experts’ suggested order in which environmental problems can be solved.

<table>
<thead>
<tr>
<th>Ranked (where 1 means greater possibility of solution and 15 means less)</th>
<th>Environmental problems</th>
<th>Total Score (where a problem was ranked 1 meant greater possibility of solution and 15 meant less)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>i) Deforestation</td>
<td>102</td>
</tr>
<tr>
<td>2</td>
<td>b) Water</td>
<td>110</td>
</tr>
<tr>
<td>3</td>
<td>h) Pollution</td>
<td>115</td>
</tr>
<tr>
<td>4</td>
<td>m) Overpopulation</td>
<td>119</td>
</tr>
<tr>
<td>5</td>
<td>d) Land use change</td>
<td>122</td>
</tr>
<tr>
<td>6</td>
<td>n) Urban growth</td>
<td>137</td>
</tr>
<tr>
<td>7</td>
<td>c) Climate change</td>
<td>151</td>
</tr>
<tr>
<td>8</td>
<td>l) Biodiversity loss</td>
<td>181</td>
</tr>
<tr>
<td>9</td>
<td>k) Overexploitation of fisheries</td>
<td>199</td>
</tr>
<tr>
<td>10</td>
<td>j) Depletion of the ozone layer</td>
<td>228</td>
</tr>
<tr>
<td>11</td>
<td>a) Acidification of the oceans</td>
<td>245</td>
</tr>
<tr>
<td>12</td>
<td>e) Alteration of the carbon cycle</td>
<td>263</td>
</tr>
<tr>
<td>13</td>
<td>g) Alteration of the nitrogen cycle</td>
<td>282</td>
</tr>
<tr>
<td>14</td>
<td>f) Alteration of the phosphorus cycle</td>
<td>286</td>
</tr>
<tr>
<td></td>
<td>o) Other environmental problems suggested by 10 participants:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consumerism</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Capitalist vision</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Waste generation</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Genetic degradation</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Uncontrolled industrialization</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Toxic waste</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Plastic waste</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Air quality-flora-fauna pollution</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Waste management</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Cultural loss</td>
<td>15</td>
</tr>
</tbody>
</table>
Variable III measurements: Opinions on what ESD should be like in Mexico.

For the analysis and interpretation of the opinion questions, the patterns with the highest frequency of mention among the experts’ answers to the five items on how ESD should be in Mexico were determined.

As it is shown in Table 5, 97% of the respondents mentioned that EE is indispensable, useful and necessary; and that it must start at home (69%) and continue at all educational levels (77%).

Table 5. Frequency measurement data on how ESD should be in Mexico.

<table>
<thead>
<tr>
<th>Item number</th>
<th>Most frequently mentioned patterns (keywords)</th>
<th>Number of experts who used them</th>
<th>Equivalent percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>How instituted is the environmental culture for sustainability in Mexico?</td>
<td>Little or very little</td>
<td>28</td>
</tr>
<tr>
<td>2</td>
<td>Is environmental education in Mexico a matter for everyone or only for experts and university students? To what extent for each one?</td>
<td>For all, at all levels and sectors. Since childhood.</td>
<td>27</td>
</tr>
<tr>
<td>4</td>
<td>Do you believe that there is a possibility for us to become - if it were the common desire, of course - a sustainable society &quot;without&quot; sustainable families? Why?</td>
<td>No. It's a family matter. For all. It must be a common goal for the society as a whole; for all the population.</td>
<td>24</td>
</tr>
<tr>
<td>5</td>
<td>From your point of view, where or when should environmental education begin?</td>
<td>At home. In the family.</td>
<td>24</td>
</tr>
</tbody>
</table>

The results obtained in this research seem to indicate that in Mexico, the opinions, recommendations and proposals of the experts may not be taken into account. Otherwise, the ESD in our country would be in consolidation, instead of being under construction, as it was established in the Plan Nacional de Desarrollo (National Development Plan) 2013-2018 of the Federal Government.
DISCUSSION

The experts’ opinions and perceptions presented in this study, clearly indicate the urgent need to broaden culture for sustainability among Mexican society, for it is a process in construction as it was indicated in the Plan Nacional de Desarrollo (National Sustainable Development Plan) 2013-2018 of the Federal Government. Therefore, our global commitment today is to build a better future for our descendants, paraphrasing what was declared by Ban Ki-moon in 2007.

Facing environmental problems for their solution, in the order suggested by the experts, demands from all inhabitants of the planet to take responsibility for their actions, and should do their share. Hence, as Nieto-Caraveo pointed out in 2007, it is urgent to strengthen the ESD in its formal, non-formal and informal modalities, to provide population with basic environmental knowledge for the better understanding of the importance of establishing an effective environment-home-school linkage.

It is evident that EE taught at school to Mexican children is of very limited influence, for in most cases, adults who are in charge of them who stopped attending school before 2006 may or may not have any idea of what is needed or what can be done – at and from home – to avoid unnecessary damage in order to sustain environment. And it is adults who make the rules and form habits.

Respondents felt that EE as the basis of sustainable development should be a lifelong process, as established by UNESCO in 2004 and further on reiterated by Macedo and Salgado in 2007, and not only a school program measured only by the years of attendance to school, as Coombs and Ahmed put it, since 1975, so as not to limit EE in time nor in space.

Experts also pointed out that those lags and distortions, González et al. alluded to in 2000, and Reyes and Bravo in 2008, prevailed in ESD nowadays. In their opinion, steps and attainments are insufficient, thus more efforts should be addressed to educate families at home, not just children at school.

In the field of formal environmental education (FEE), their perceptions coincided with those of Montaño (2012) regarding the pertinence of overcoming the great deficiencies and poverty that prevail throughout all country’s educational levels as a consequence of having disqualified teachers who show no interest in environmental issues, have none or not enough training in this matter and their unwillingness to handle EE with their students.

In Mexico, out of the environmental problems which were textually contemplated in the National Development Plan 2013-2018, the deforestation, change of land use, unplanned urban growth, and the loss of biodiversity in a large part of its ecosystems by favoring the extraction of minerals are the product of economic decisions to solve economic interests of the free enterprise, but all this also serves as palliatives to solve economic needs of employment and sustenance of an overpopulation that in turn, leads to an excessive rate of urban growth and the, the economic comes into collision with the social causing an unavoidable impact in the environment. However, in the opinion of experts, this part of the country’s environmental problems can be solved if
new paths were created to find appropriate solutions, as COMPLEXUS announced.

Building a better future demands a firmly enforcement of environmental laws and regulations in order to halt the growing deterioration of the environment and its ecosystems which result from the non-compliance of the legislation, as it is currently the case; a situation that was suggested in the Mexico Report 2016, prepared by the Bertelsmann Foundation (2016); diagnosis in which the experts agreed.

As for the unfeasibility of solving some of the environmental problems that were taken into account for the purposes of this research, although experts said that there are feasible possibilities to solve the water problem in Mexico, they also pointed out that worldwide, mainly due to its scarcity but also to waste, abuse or misuse habits and the great pollution caused by the various anthropogenic activities, the water problem is real and merits precautionary measures to avoid major and unnecessary complications and above all, the need to favor its responsible and efficient management, use and reuse, from a personal level. Water is a vital natural resource, whose use and care is of mankind’s competence. Failing to take preventive actions represents a very high global threat risk, for the survival of all living beings.

In agreement with what Barraza said in 2002, the experts considered that, although it is the intergovernmental organizations and the signing of international trades or agreements that, at a global level, define the lines or strategies for action, local plans and programs to be implemented in a particular region have to take into account the local problems and the social, economic, political and cultural reality of each country in order to find workable solutions.

Likewise, they coincided with Calixto (2012) that parents or guardians - who did not take EE in school – need to be told what their responsibility and duties as residents of a multicultural and megadiverse country are, in order to be able to adopt friendly environmental habits and thus, to generate and promote sustainable attitudes, behaviors and habits among their children.

CONCLUSIONS

The socioeconomic, political and environmental framework of Mexico supports the urgent need and relevance of implementing ESD in its different modalities for all and throughout life, taking into account the perceptions and recommendations of the experts in this field.

The lack of a solid culture for sustainable development that results from a weak ESD impedes the daily practice of values and sustainable habits from and in the bosom of the families in Mexico.

There are more than enough reasons to consider that complementing FEE with its non-formal modality will enable the prevention and mitigation of environment’s increasing destruction. Non formal environmental education is a relevant alternative to strengthen the culture for sustainability in Mexican families. Besides, when EE is confined to the classroom, which is what happens in Mexico, it becomes a privilege
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for some rather than an equal right for all; a sort of discrimination and a major
disadvantage for developing countries with an incipient ESD.

The change of attitudes and habits, the acquisition of environmental values and the
generation of sustainable behaviors to privilege the good of the planet and mankind is
a colossal challenge, but also a possible one.

The knowledge, experience, prestige and professional recognition of the experts who
participated in the survey are elements of value and reliability. If their suggestions and
recommendations, commented in this paper, and many others as well, were taken into
account by those in charge of the definition of strategies and the design of plans and
action programs, public policies and campaigns to raise environmental awareness in
the population that is needed to inhibit the anthropogenic activities that are some of
the main causes of the environment’s deterioration, this colossal challenge would be
of less complexity.

It would be prudent and advisable for those in charge of developing such projects to
approach universities to consult their experts in ESD, not only their pedagogues.
Consulting and counseling on environmental matters is as specific as resorting to a
biologist to ask for his or her opinion and advice on matters of accounting nature,
instead of turning to a certified public accountant, for example. Not resorting to
environmental science experts when it comes to dealing with environmental issues is
to waste knowledge and, at the same time, to expose the decision-making process to
unnecessary risks and dangers that, in the long run, are priceless in terms of
conservation and environmental services, among other of the inherent issues like the
protection, care and conservation of renewable and non-renewable natural resources
and their efficient management.

Therefore, the contributions of the experts should inevitably be translated into
curricular contents not only for the formal modality of EE, in the institutions of higher
education where they collaborate, but also for national implementation in all the
educational centers of the country, regardless of the system or subsystem to which
they belong. These contributions should also be considered by the government for the
design of public policies of EE plans and programs aimed at educating or re-educating
the entire population; in EE’s three modalities: formal, non-formal and informal.

Moving towards sustainability implies EE for each and every member of a society,
regardless of age, work or any other feature of his or her profile. All living beings
depend on the planet’s natural resources, even before birth; and no exception applies
to this rule. We are responsible for the welfare of the planet. In other words, we are
responsible for our own quality of life, our health and those of others.

One can agree or disagree with the readings of the three variables that were measured
in this survey, but there is no way to deny that in the field of ESD Mexico, at a
country level, has the challenge of accelerating pace and speed to consolidate culture
for sustainability among its population.
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