

## Little environmental dimension, gives reason to an urgent need and sustainable proposal of curricular inclusion

**Dr. Ramón Bedolla Solano<sup>\*1</sup>, [rabedsol@hotmail.com](mailto:rabedsol@hotmail.com),  
Dr. LogamurthieAthiemoolam<sup>\*\*2</sup>, Dra. María Laura Sampedro Rosas<sup>\*\*\*3</sup>.**

### Abstract

The environmental crisis in the world, has promoted the integration of the environmental dimension in education, in this area, are located universities. Resolutions of international summits such as the one organized by the United Nations in Johannesburg in 2002 led to the introduction of the Environmental Dimension in the educational field. Many educational institutions do not. The results of a research conducted in November 2015 at the Nelson Mandela Metropolitan University, School of Education in Port Elizabeth, South Africa, according to the objective "to identify the environmental in the curriculum and the need for its integration", showed that "environmental" does not included, and added to it, a proposal based on the curricular design that includes steps for its inclusion arises. The identification of the environmental, was determined through the results of a survey that was previously reviewed and piloted and that covered the variables (environmental problems, curriculum and environmental competencies), this instrument was applied to the actors of the educational process, study sample. The sample was given through a non-probabilistic approach. It is determined, according to the problem identified, the need to implement the environment as a dimension in the curriculum.

**Key words:** Competencies, Environmental crisis, Curriculum, Necessity, Inclusion, Sustainability.

---

<sup>1</sup> PhD in Education Sciences and Dr. in Regional Development, Autonomous University of Guerrero (UAGro), Mexico. Academic Unit of Sociology - Academic Unit of Regional Development (Educational Program: Doctorate in Environmental Sciences (PNPC-CONACYT), Research Group: Education and Sustainability. E-mail: rabedsol@hotmail.com

<sup>2</sup> Expertise: Multicultural Education, English Language Teaching, Drama-in-Education, Educational Management. Faculty of Education, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.

<sup>3</sup> PhD in phytopathology. Academic Unit of Regional Development (Educational Program: Doctorate in Environmental Sciences (PNPC-CONACYT), Autonomous University of Guerrero, Mexico, Research Group: Environment and Development.

## Introduction

In the middle of the last century the environmental crisis was an issue that became important in the social field, today, it is perceived in the same way because this issue instead of decreasing, every day is expanding, that means, environmental problems do not have been stopped, these have adversely impacted the world, man has not promoted a critical and purposeful sense to such a situation.

This issue is of interest to all and not to a few, society, authorities, educational institutions, etc. The international meetings have been discussing the theme "environment" and have proposed to integrate it in the educational field. The school curricula in their analysis of context must value the resolutions issued from those international meetings in relation to emerging issues that suggest to be introduced in the field of education, for this fact, it is understood that education should not be detached from social needs. The inclusion of the environmental, leads to environmental, to include Environmental Education in the curriculum. The method of integrating this would be through various actions that have the purpose of linking the activities of the school with the environment, it means, integrating subjects, developing projects, etc. However, at present, the suggested method is to introduce the environmental from a transversal approach, an example of this would be, to relate all learning units of a curriculum to the environment, therefore, the teacher will design the appropriate educational strategies. It should be noted that environmental approaches in the educational field have undergone changes, before they were educated only for nature, today it transcends socio-environmental, encompassing nature, environment, society, economy, etc. The introduction of the environmental dimension implies understanding the environment within the social field in relation to sustainable development. A university curriculum that integrates the environmental dimension with a socio-environmental approach practically contributes to social sustainability.

The need to contextualize the school curriculum

The curriculum lays its foundations in pedagogical, psychological, social, etc. In the social field, it is which examines the problems that beset it, such as the environmental, for example, in the face of this situation, the social needs that will be addressed arise. The theoretical framework in which

the curricular proposal is elaborated, among them, philosophical / sociological, epistemological, cultural, linguistic, psychological, pedagogical, Scientific Management, Silverio (2005). Context analysis consists of identifying how referrals and discourses will influence the educational project; But also in the opposite direction: the way in which the educational project seeks to influence them and, therefore, in the broader social reality (Nieto and Buendía, 2008). Some curricular designs indicate the problems, however, do not pick up on their development.

#### Environmental issues in the social context

The environmental crisis facing the planet is not now, though, since the mid of the last century or before, the society had realized this, consequently, since then, international organizations such as the United Nations, organized and carried out Meetings with themes related to the environment. Treat, (2006), stipulates that the problems are represented by pollution, degradation, animal trafficking, climate change, etc. and are attributed to the human being because of the scarce cultural level they possess. The current economic development model has resulted in a series of environmental problems (Espejel and Flores, 2012a, p.1). The situation of the planetary emergency generated by human activity since the mid-20th century has manifested itself in environmental problems, loss of biological and cultural diversity; Which have as obvious causes hyperconsumption, exploitation, and demographic transition, human inequities and imbalances (Mora-Penagos, 2012: Edward et al., 2004: Bedolla, 2014). The causes attributed to environmental problems are mainly attributed to cultural causes - unconsciousness, lack of education and irresponsibility (Lara, 2010). In its majority and according to what concerns the lines that precede, the main cause of the environmental problem that persists is the man.

#### Environmental Education for Sustainability

The school curriculum is the project that must include social demands, must link what happens abroad with the interior, environmental issues as well as other social issues should not be left out of the project. The environmental crisis as problematic, has become a necessity, a "need" that must be met. The environmental dimension in the curriculum implies inserting it in some way and this implies that teachers and students must be prepared to face this challenge. Environmental education

has become increasingly important. Although the incorporation of this emerging field was proposed from the first international meetings on the same field in the second half of the seventies (González, 2000). Environmental education must consider the environment as a whole - natural and man-made, ecological, economic, technological, social, legislative, cultural and aesthetic "(Unesco, Pnuma, 1976, p.4: Florez, 2013) .

Significant advances in Environmental Education (EE) were made in the 1970s, and by the end of the 20th century environmental protection and education were clearly needed. In 1968 in Paris with the Biosphere Conference, there are guidelines for incorporating EE into the education system (Moreno, 2008). EE's formal recognition of its importance is established at the United Nations Conference on the Human Environment In Stockholm in 1972. In the 1970s and 1980s, there were some other citations for addressing educational issues related to environmental and ecological aspects (Paz et al, 2014). Alcántara (2006) mentions that Environmental Education was initially born with the contact of nature in the 1970s and soon expanded its field of action in other environmental problems, including socioeconomic. Environmental education must be an integral process, which plays its role in the whole framework of teaching and learning (Martínez, 2010). Environmental Education (EE) is the basic tool for all people to become aware of the importance of preserving their environment and to be able to make changes in their values to drive them to action by preventing and mitigating existing and future problems ( Sauv e, 2004: Espejel, 2012b, p.1). UNESCO (2005-2014) postulates that Education for Sustainable Development (ESD) enables every human being to acquire the knowledge, skills, attitudes and values needed to build a sustainable future. Educating for sustainable development means incorporating key issues of sustainable development into teaching and learning, for example, climate change. Chagoll n and  vila (2006) consider that Environmental Education (EE) is not a field of study such as chemistry, physics, biology, or ecology, that EE is a process and in fact the term would be Education for Sustainable Development.

Environmental Education currently has different approaches to which it employed in their early days, at the beginning it was conceived as, educate to conserve and protect nature, today, with the integration of sustainable development within this field, is educated, to be aware and act in favor of the environment, taking into account, that environment includes nature and other aspects that

are in constant interaction. Environmental Education for sustainability goes beyond educating only for nature, it links, the natural, the social, the political, etc. in such a way, EE, educate for sustainability. With regard to insertion within the school curriculum, Environmental Education should be integrated with the sustainable development approach.

Transversalization of the Environmental Dimension with a Sustainable Approach in the educational project

The mainstreaming of this dimension in a curriculum, aims to incorporate and at the same time, to impregnate the environmental issue in the educational project with a socio-environmental focus, that is, it involves nature, society, economic issues, etc. The impregnation of the environmental theme in the curriculum implies adhering to an Environmental Education for Sustainability, it means, education with a focus on sustainable development. As established by The UNESCO, UNEP, 1976, p. 4: Florez, (2013b), environmental education must consider the environment as a whole. Introducing this dimension, leads to analyze the educational environment from various positions. Mercado (1993), says that including the environmental dimension involves including social subjects in careers and considering these issues as cross-curricular contents in the curricula and addressing different postures about the environment (Ramírez and González, 2014). Mejer (2007) conceives the environmental dimension as "a social process aimed at creating and transmitting the cultural heritage of a society" (p.26). (Azuaje, 2011).

Florez (2013c) stipulates that EE considers the environment, some of the proposals that are handled for universities or education in general in terms of incorporating the environmental dimension are the transversal axes; Which José Palos defines as complements of education. (Palos, 2000, pp. 9-10: Rodríguez, 2009). "Cross-cutting themes are issues raised by the problematic situations that affect our society in general and the community in particular" (CONAM S / F). Torres (1996) states that including the environmental dimension in the school involves permeating all areas of knowledge, all school activities and engaging all sectors that make up the school structure with a new school project. A methodological approach to implementing the environmental dimension in curricula or curricula is the method of mainstreaming.

## Methodology

This study was conducted at the Nelson Mandela University School of Education in Port Elizabeth, South Africa. Although a United Nations event on the environment took place in South Africa in 2002, environmental issues in education have not been integrated. Since the United Nations Conference on Environment and Development, sustainable development has remained elusive for many African countries. Poverty remains a major obstacle and most countries on the continent have been unable to take full advantage of the opportunities of globalization, which has exacerbated the marginalization of Africa. (United Nations, 2002: 3.49). Africa is characterized by being a continent where flora and fauna abound, so South Africa is not without it. South Africa has considerable variation in climate as well as its topography (SouthAfrica.info). The South Africa Yearbook (2011/12) - Environment, stipulates that the country is rich in different species of plants and animals. The place where this study was carried out is Port Elizabeth. It is one of the largest cities in South Africa, it is home to a magnificent variety of plants and animals (© Copyright www.portelizabethforever.co.za). South Africa is facing many of the problems experienced in developing countries where rapid increases in industrialization, population growth and urbanization endanger the quality of the environment (South Africa Yearbook 2011/12b).

## Type of Study

This research addresses the paradigm of mixed research. Mixed designs represent the highest degree of combination or integration between the qualitative and quantitative approaches (Hernández, Fernández and Baptista (2003); Pereira, 2011; Bedolla et al., 2015: pp. 1-11). This research culminates with the description of the findings.

## Population

The research was conducted at Nelson Mandela Metropolitan University (NMMU) at the Faculty of Education in Port Elizabeth South Africa. The university as a whole has a population of 26,347 students, of which 12,613 are women and 13, 734 are men. With respect to the academic plant, there is a total of 1652, between permanent and temporary. He teaches undergraduate and graduate



levels. The university provides training in the fields of engineering, ecology, marine studies, community health, environmental construction, arts and design, accounting and auditing, education and information technology.

### Sample

The selection of the sample was based on the qualitative approach, a statistical procedure was not carried out to obtain it. The sample in the qualitative approach, establishes to collect data, without necessarily being representative of the universe or population studied (Hernández et al 2008, p.562: Angulo, 2011: Bedolla et al., 2015c: pp. 1-11).). The selection of the objects of study was due to time, chance and convenience. In qualitative research, convenience sampling is used when a population is chosen and it is not known how many subjects may have the phenomenon of interest, here they resort to the subjects that are found (Mendieta, 2015). The Faculty of Education has 1779 Students, of which 548 are men and 1231 are women. Regarding the academics, this faculty has 85 professors of which, 44 are permanent and 41 are temporary. 46 students and 10 teachers were selected.

Data collection techniques to diagnose the presence of the environmental element in the study plan (The Diagnosis).

A survey was applied to the selected sample. A survey for students and another for teachers, with the aim of identifying the incorporation of the environmental dimension into the institution's curriculum. Although the survey for both followed the same purpose and variables, the questions for students differed from that of the teachers. This instrument was designed by the research team. The survey considered the dimensions or indicators proposed by Cárdenas (2014), which state that the evaluation of the incorporation of the environmental dimension in universities will be carried out for the following functions or areas: government and participation, internal environmental management, training, research and extension. Therefore, the survey implemented three variables (perception of the environmental problem, integration of the environmental element in the curriculum and the understanding of environmental knowledge in teachers and students). The surveys prepared before being applied were reviewed by experts, also, they were previously applied

in a university with teachers and students, were 500 students and 50 teachers of the educational programs of Sociology, Economics and Law of the Autonomous University of Guerrero in Acapulco, Mexico. With the results of the study in Mexico, it was found that the Environmental dimension is minimally present in the curricula in question. The result was similar to the study carried out at the University of Port Elizabeth South Africa. The survey that was applied at the faculty in South Africa was the same that applied in Mexico, with some minimal changes, however, to apply to students and teachers, it had to be translated into English. The study in South Africa was conducted in November 2015. The survey was processed through the IBM SPSS Statistics 20 statistical program and the results are described for diagnostic information. The results of this study led to the elaboration of a proposal that corresponds and suggest to the urgent need to implement Environmental Education for Sustainability in the curriculum of some university institutions. As for example, the Faculty of Education of NMMU.

## Results

The results of the diagnostic study are described in tables a) results of students and b) Results of teachers.

### a) Student results

According to the survey, that is to say, to the information provided by students in relation to identifying the incorporation of the environmental element in the curriculum, the results obtained are presented generally, quantitatively and qualitatively. Each dimension contemplated about ten questions with options (1, totally disagree, 2, disagree, 3, moderately agree, 4, agree, 5, totally agree). The answers obtained by each dimension were grouped in percentages according to the statistical analysis performed, and the results were analyzed in percentages in a global way by dimension, are presented in the following table. Total students surveyed, forty-six (12 men and 34 women). Faculty of Education of NMMU.



Dimensions	Items	Percent reached										
		0	1	2	3	4	5	6	7	8	9	10
	The survey questions were framed in the dimensions that are contemplated in the left side of this table. The objective of each dimension was determined by the name of the variable, therefore, the questions were adjusted accordingly.	0	1	2	3	4	5	6	7	8	9	10
		%	0	0	0	0	0	0	0	0	0	0
			%	%	%	%	%	%	%	%	%	0
												%
1. Perception of environmental issues.	Understanding the environmental problem.										X	
2. The integration of the environmental element into the curriculum.	The curriculum integrates the environmental dimension of the Faculty of Education of the NMMU.	X										
3. The understanding of environmental knowledge in students.	Students develop environmental competencies.	X										
	Teachers have environmental competencies.	X										

## B) Results teachers

The results obtained by teachers in relation to identifying the incorporation of the environmental element in the curriculum are presented in a general, quantitative and qualitative way. Each dimension contemplated about ten questions with options (1, totally disagree, 2, disagree, 3, moderately agree, 4, agree, 5, totally agree). The answers obtained by each dimension were grouped in percentages according to the statistical analysis performed, and the results were analyzed in percentages in a global way by dimension, are presented in the following table. Total teachers surveyed (five men and five women). Faculty of Education of NMMU.

Dimensions	Items	Percent reached										
		0 %	1 %	2 %	3 %	4 %	5 %	6 %	7 %	8 %	9 %	10 %
	The survey questions were framed in the dimensions that are contemplated in the left side of this table. The objective of each dimension was determined by the name of the variable, therefore, the questions were adjusted accordingly.	0 %	1 %	2 %	3 %	4 %	5 %	6 %	7 %	8 %	9 %	10 %
1. Perception of environmental issues.	Understanding the environmental problem.										<b>X</b>	
2. The integration of the environmental element into the curriculum.	The curriculum integrates the environmental dimension of the Faculty of Education of the NMMU.	<b>X</b>										
3. The understanding of environmental knowledge in teachers.	Students develop environmental competencies.	<b>X</b>										
	Teachers have environmental competencies.	<b>X</b>										

### Qualitative analysis of the information os students and professors

The results of teachers and students in relation to understanding the incorporation of the Environmental Dimension in the curriculum of the Faculty of Education were similar, both affirm that the "environmental" is scarce in the educational project of the institution, this has been confirmed in their statements claiming that the curriculum does not integrate this dimension. This gives rise to the need to incorporate the environmental dimension with a focus on development in the school project. A low environmental dimension denotes an error of curricular contextualization

for not linking urgent and emerging issues. The environmental is a problem that becomes a necessity to attend, for this reason, universities must adhere this element in their study plans.

The results of this research led to a sustainable proposal to integrate the Sustainable Environmental Dimension into an educational curriculum within the framework of the results of this study. The proposal can be adopted by the faculty or institution where the study was carried out or by some other institutions.

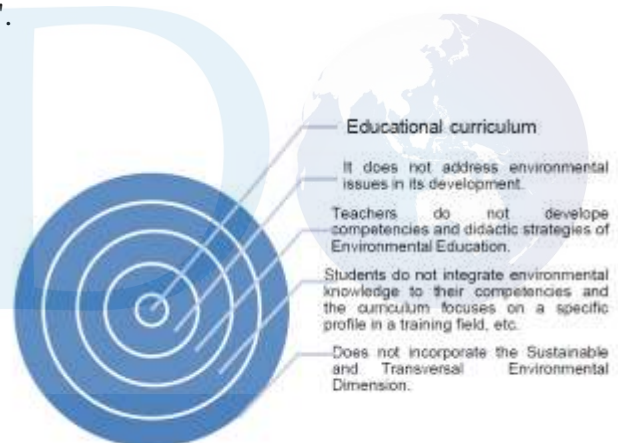
### **Proposal to integrate the Sustainable Environmental Dimension into an educational curriculum.**

The proposal is based on the points described in the introduction of the present and specifically on "The need to contextualize the school curriculum".

#### **First step**

Diagnosis of the presence of the environment element

It is suggested to carry out a curricular evaluation to identify the presence of the environmental element in the curriculum. There are different ways, in this case, the survey was used to teachers and students.



#### **Second step**

The curricular contextualization 1

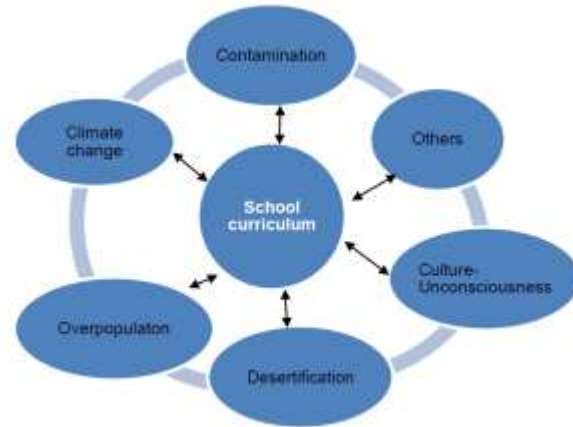
All curricula must be based on several fields. In the social foundation, the problems are located, among them, the environmental ones, these, must be analyzed in the educational project, therefore, these, must influence in its implementation



### Third step

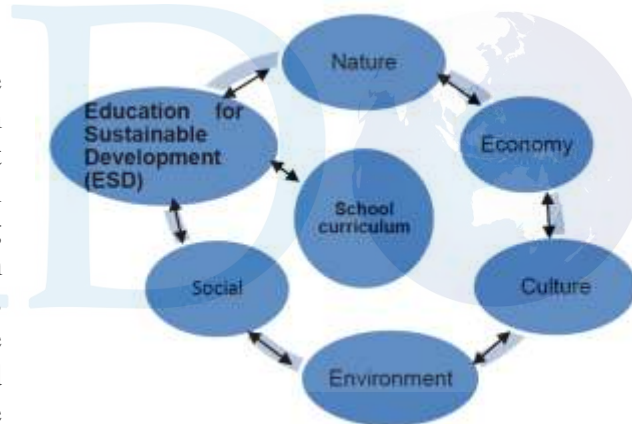
#### The curricular contextualization 2

The contextualization of the environmental crisis. Environmental issues are considered and should be taken into account in their implementation. The incorporation of themes with disciplinary or cross-cutting approaches such as; Climate change, soil pollution, air, desertification, or any topic that is linked to the environment, at that time the environmental dimension is implemented and, therefore, Environmental Education.



### Fourth step

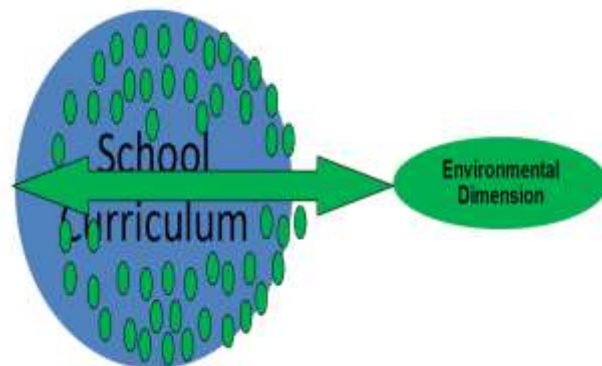
It is suggested to incorporate the Environmental Dimension in the curriculum with a sustainable approach. The current theoretical methodological approaches in education suggest incorporating Environmental Education in the curriculum with a support in the development, which is understood as an Education for Sustainable Development (ESD), that is to say, it should not only take care of the preservation of the natural, it should links with the socio-environmental (nature, society, economy, etc).



### Fifth step

The environmental dimension with a transversal approach in the curriculum

The environmental dimension consists of integrating in a way as its name says "the environmental" in the curriculum, the environmental must impregnate the curriculum. It does not mean to convert a curriculum to train specialists in the environmental sciences, it means to



environmentalise the curriculum so that individuals adhere competences in this matter to those of their formation. Transversal implies bringing environmental to the curriculum through various practices. An example of this, a learning unit, must incorporate in its competence the environmental transversally.

The five steps concerning this proposal, aim to green, to incorporate the green "environmental", with a focus on development, to the educational field, so that the universities, from their spaces contribute in a way, in a sustainable world. The main actors of the educational process, that is to say, teachers and students, are the key point, in them, this responsibility falls mainly, teachers because they must possess environmental skills to develop them didactically in their academic work and influence in some way in the construction of sustainable learning with students, and the students, because, in building sustainable competencies, they will contribute to satisfactory actions in favor of the environment. This will happen, if the universities include Environmental Education practices with a focus on development in their curricula.

### **Discussions and conclusions**

The environmental crisis is fundamental and urgent to attend worldwide, without exception. The international meetings and summits on the environment they started in the middle of the last century, led to the introduction of the environment not only in the educational field but in other sectors. In the field of formal education, institutions of higher education have much to do. Degradation of the ozone layer, environmental pollution of water, soil, deforestation, etc. evolves even more. Humanity does not conscience, nor acts to stop this affecting. The integration of the dimension in question in the educational plans, aims to be integrated with the purpose of taking actions that make it possible to mitigate and respond with solutions to what affects the environment with a socio-environmental focus. With regard to this, it is up to universities to monitor their curricula and therefore, teachers and students to implement what concerns their integration. There are universities that have implemented this dimension in their school work, others do not, it seems that where not, the environmental is not a problem. At the NMMU School of Education, the environmental dimension is not described in the student's curriculum and graduation profile.

With the diagnosis made, which contemplated valuable information of teachers and students that gave of a result that the environmental is not present in the curriculum of the Faculty of Education of NMMU, discussed the following:

The incorporation of the environmental dimension and, therefore, of Environmental Education was not just, however, in some countries was given after or has not yet been given. A clear example is the case of Mexico. According to González et al., (2000: 3), In Mexico, Environmental Education had a late onset with respect to other North American and European countries. This being said, denotes the reason why in some universities in the world the environmental dimension is not present in their curricula. The findings in this study allow us to relate this. In Africa, in Johannesburg in 2002, the United Nations organized the World Summit on Sustainable Development. At that summit, they addressed sustainable actions for the world, including strengthening education, environmental issues were a key issue. Although this meeting has been held in this country, there are educational institutions that have ignored the agreements issued at that summit. At the meeting held in South Africa, the term development for education that incorporates the environment as an object of study is introduced and strengthened. The new conceptualization of the Johannesburg EES under the orientation of the incorporation of sustainable development into higher education (Bravo, 2012b).

This give to know that it is not only important to educate for nature but to educate to link nature, environment, social and other strata in which the human being develops. Nieto et al. (2008) states that Environmental Education for Sustainability (EES) involves relating (environment, economy, society, politics, nature, culture). The summit on sustainable development in the African country reinforced the strategy of implementing actions for the environment "Sustainable development has remained elusive for many African countries (United Nations, 2002c: 3.49). South Africa is facing many of the problems experienced in developing countries where rapid increases in industrialization, population growth and urbanization endanger the quality of the environment (South Africa Yearbook 2011/12 - Environment). These assertions reveal and doubt why the NMMU Faculty of Education does not consider EE in the curriculum. South Africa has a great biological and representative diversity in the world. In document (© Copyright



www.portelizabethforever.co.za) it is established that the lack of environmental education minimizes the consciousness and culture of the people, the effects on the environment will continue if the University does not do their part.

The results of the present study are similar to those of a research entitled "The inclusion of the environmental dimension in the curriculum of the Biology Program of the University of Tolima" in Colombia. The objective of this study was "To determine the curricular factors of the Biology Program of the University of Tolima and its relation in the environmental training of the future professionals in Biology", of qualitative type. This research made necessary the participation of students, graduates and teachers belonging to the Biology Program of the University of Tolima. The dimensions according to the objectives were the same as in the study in question. The results showed that the environmental component within the Biology program of the University of Tolima is not included (Pérez, 2015). The exclusion of the environmental dimension in the curriculum of universities is worldwide, it is not exclusive to universities in South Africa. Agreements on the need to implement educational actions, products of international meetings, summits or conventions such as those held by the United Nations have had no effect on educational levels.

The need to include the Environmental Dimension in the curriculum

The need to include the environmental dimension in the educational curriculum and specifically in the universities, is based on the point "Environmental Education for Sustainability" described in the introduction of this document. To a lack of environmental dimension in the curriculum of the faculty where the study was carried out, the idea arises of creating a proposal to include this dimension, in this way it is suggested to the faculty in question to analyze it and consider it in the future. One of the processes in curricular design is to identify the problems that revolve around the context, these problems become needs to be addressed in the educational plan that is elaborated, there are many issues to address, however, in these lines is done Reference to the theme "environment", which can be taken care of transversely or in any other way.

Many scientific publications point to the need to include the environmental issue in the field of education. According to Parga, Mora and Cárdenas (2014), they state that the Ministry of National

Education and the Ministry of the Environment formulated and implemented what is now known as the environmental education policy (SINA, 2002), which establishes The need to incorporate environmental aspects at all school levels. Gil, (2014), concluded that the authors assume the need for a curricular transformation towards the inclusion of environmental contents. When talking about curricular environmentalization, it is assumed that the contents and environmental competences are part of what is expected to be learned in the school.

This posture implies that it is not only desirable to include environmental contents in the official curriculum, but these must permeate teaching practices. Mora, (2013), explains that in the last three decades the need to include the environmental dimension in Higher Education (HE) appears as an imperative, in which ES institutions around the world must respond effectively to the application of Models focused on Sustainable Development (SD) showing paths and concretions that aim to satisfy the basic needs of society. In this way, the integration of the environment has appeared in the Institutional Educational Projects of the universities and in particular their institutional functions of teaching, research, extension and management. It is urgent and necessary that the environmental issue is addressed in the educational field, is of worldwide interest, in every corner of the planet happen events, product of the devastation and deterioration that the same human being produces through anthropogenic activities that unconsciously. The need to implement the environment implies that the curriculum connoisseurs assumes this dimension as something of concern, that they know the curricular methodology to integrate it and that they prepare all those involved (of the institution), in the sense of implementing and developing this new Practice.

As a conclusion, it is emphasized the importance of linking the educational project of universities with what society demands, with the problems that revolve in the context, if not, it is considered unrelated to reality. The diagnosis applied in the Faculty of Education resulted in the lack of environmental dimension, however, this is because the curriculum of this faculty in its graduation profile, to train professionals specialized in the art of pedagogy, teaching and didactics, this is a curriculum that focuses on a specific field of professional training, not only happens here, even in the educational programs of the Autonomous University of Guerrero, Mexico, where the pilot study was conducted. Currently, curricula must be comprehensive, sustainable and innovative practices

must be differentiated from traditional, square or closed curricula that focus only on resolving issues through disciplines or fragmented knowledge. Current curricula must be multidisciplinary, emancipatory, constructivist, by competencies, so that students graduate with knowledge, skills, attitudes and values attached to sustainable practices.

Referring to the United Nations (2002), about Africa, "In many of African countries it has not been possible to achieve development because of the problems facing it, poverty in the first place." In this sense, universities must bet on Environmental Education as a method of intervention to achieve sustainability and guaranteeing the formation of citizens who are aware, responsible, critical and propitious to the reality they face.

## References

Alcántara, M. et al., (2006), "Environmental Education, Biodiversity, Natural Spaces and Nature. III "(Environmental Education Conference of the Autonomous Community of Aragon, 24, 25 and 26 March 2006 • CIAMA, LA ALFRANCA, ZARAGOZA), [http://www.google.co.za/url?Sa=t&rct=J&q=&esrc=s&source=web&cd=1&ved=0CB0QFjAAahUKEwjytZ\\_fl4jJAhXEObKHTUkCp0&url=http%3A%2F%2Fwww.aragon.es%2Ffestacia%2Fcelia%2FBIODIVERSIDAD.pdf&usg=AFQjCNG\\_w2VXsGDaM8MXXl\\_LcJfQVfoU3Q](http://www.google.co.za/url?Sa=t&rct=J&q=&esrc=s&source=web&cd=1&ved=0CB0QFjAAahUKEwjytZ_fl4jJAhXEObKHTUkCp0&url=http%3A%2F%2Fwww.aragon.es%2Ffestacia%2Fcelia%2FBIODIVERSIDAD.pdf&usg=AFQjCNG_w2VXsGDaM8MXXl_LcJfQVfoU3Q) [Inquiry: apr. 2016].

Azuaje, F. (2011). The environmental dimension in the university educational context. *Revista Científica Digital of the Center for Research and Management Studies (Barquisimeto-Venezuela)*, 1 (4), 132.

Bedolla-Solano, R., Aparicio-López, J.L., Rodríguez-Alviso, C., Beltrán-Rosas, J., and Miranda-Esteban, A., (2014). The curricular environmentalization of the study plans at the Autonomous University of Guerrero. Case of Sociology Program. *Tlamati*, 5 (3), 14-21

BEDOLLA, Ramón et al., (2015), "Performance Evaluation according to the Teaching Competences of the higher level in UAGro. Academic Unit of Nursing ", *Magazine Forum of Studies on Guerrero*, No. 1, Council of Science and Technology, pp. 1-11.

Cardenas-Silva, J.M., (2014). Matrix of indicators of incorporation of the environmental dimension in universities. Interuniversity Environmental Network, INTERUNIVERSIA, Peru. Consulted in: <file:///C:/Users/Angel/Downloads/2015-01-12-jmc-matrix-of-indicators.pdf>

CIUDADES.CO, "Town of Port Elizabeth" (Eastern Cape), [http://www.ciudades.co/sudafrica/ciudad\\_port-elizabeth\\_6070.html](http://www.ciudades.co/sudafrica/ciudad_port-elizabeth_6070.html)[Consulta: Apr. 2016].

© COPYRIGHT, [www.portelizabethforever.co.za](http://www.portelizabethforever.co.za), <Http://www.portelizabethforever.co.za/port-elizabeth-fauna.html>[Consulta: abr. 2016].

CONAM, National Environmental Council (S / F), "Environmental Education as a cross-cutting theme. Manual to work in classroom programming. Lima, Peru". Environmental Education as a transversal theme, Manual for working in classroom programming), Peru. Pp. 8-11.

Chagollán, F.A et al. Environmental education. 1. Ed. México: UMBRAL, 2006.

Espejel-Rodríguez, A., and Flores-Hernández, A. (2012). School and community environmental education in the upper middle level, Puebla-Tlaxcala, Mexico. Mexican Journal of Educational Research, 17 (55), 1.

Florez-Restrepo, G.A. (2013). The environmental dimension in school settings. Education and science (16), 135.

Gil, M, J. (2014). Include environmental content or form with an environmental perspective? RIPS (Havana, Cuba). 13 (2), 128.

Gonzalez, G. E. (2000). The transversality of Environmental Education in the curriculum of basic education. National Center for Environmental Education. 2. Consulted in: [http://www.mapama.gob.es/es/ceneam/articulos-de-opinion/2000-edgar-gonzalez\\_tcm7-180887.pdf](http://www.mapama.gob.es/es/ceneam/articulos-de-opinion/2000-edgar-gonzalez_tcm7-180887.pdf)

González, Edgar et al., (2000), "Environmental Education in Mexico: Achievements, perspectives and challenges facing the new millennium". Mexico, Ministry of the Environment, Natural Resources and Fisheries. Presented at Congress III Ibero-American Congress of Environmental Education. Mexico. p.3.

United Nations Educational, Scientific and Cultural Organization (UNESCO) (2005-2014) "Education for Sustainable Development", accessed at: <http://www.unesco.org/New/es/our-priorities/sustainable-development/> [Consultation: Nov. 2015].

Lara-González, José D; Fernández-C, A., Silva-G. HE; And Perez-A. R., (2010). Social representation of the causes of environmental problems. The case of the Benemérita Autonomous University of Puebla. Trajectories, 12 (30), 40.

Martínez, Roger (2010), "The importance of environmental education in the face of current problems", Educare Magazine, No. 1, p. 1.

Mendieta-Izquierdo, G. (2015). Informants and sampling in qualitative research. Andean Research. 17 (30), 1149.

Mora, P. W.M. (2013). The inclusion of the environmental dimension in higher education: A case study in the Environmental Faculty of the District University in Bogotá. IX International Congress on Research in Science Didactics. Bogotá. P. 2375.

United Nations, (2002), "Report of the World Summit on Sustainable Development. Johannesburg, South Africa". NY. Pp.3,53.

[Http://www.cepal.org/rio20/noticias/paginas/6/43766/WSSD\\_Informe.ESP.pdf](http://www.cepal.org/rio20/noticias/paginas/6/43766/WSSD_Informe.ESP.pdf)[Consulta: abr. 2016].

Nieto-Caraveo, L.M., and Buendía-Oliva, M. (2008). Guide for the Analysis of the Context of an Environmental Education Project, San Luis Potosí-Mexico. Internal Document of work of Diplomate, 5.

Paz-M., L; Avendaño-C., W; And T-Stop. A., (2014). Conceptual Development in the Colombian Context. Blue Moon, (39), 255.

Parga-L., D; Mora-P., W.M., and Cárdenas -R. Y. P. (2014). The Environmental Dimension: A necessary inclusion in the training of chemistry teachers. Biography, writings on biology and its teaching. (2027), (1034), (86).

Peréz-Cediel, C.A. (2015). The inclusion of the environmental dimension in the Curriculum of the Biology Program of the University of Tolima. Research work presented as partial requirement to qualify for the title of: Magister in Education. Militar University of New Granada. Bogota. P-p. 2-140. Consulted in: <http://repository.unimilitar.edu.co/bitstream/10654/7457/1/INCLUSION%20DE%20LA%20DIMENSION%20AMBIENTAL%20EN%20EL%20PROGRAMA%20DE%20BIOLOGIA.pdf>

Ramírez-Vázquez, Y., and González-Gaudio, E.J. (2014). The environmental dimension in the bachelor's degrees with a business approach. Administrative Science, (1), 54.

Rodríguez-Vázquez, E. (2009). The environmental dimension in universities. X National Congress of Educational Research. Consulted in: [http://www.comie.org.mx/congreso/memoriaelectronica/v10/pdf/area\\_tematica\\_03/ponencias/1527-F.pdf](http://www.comie.org.mx/congreso/memoriaelectronica/v10/pdf/area_tematica_03/ponencias/1527-F.pdf)

Silverio-Gómez, M., (2005). Basic Curricular Basis. Education and Technology, 1 (1), 5.

South Africa Yearbook 2011/12 - Environment. Consulted in: [http://www.gcis.gov.za/sites/www.gcis.gov.za/files/docs/resourcecentre/yearbook/2011/14\\_Environment.pdf](http://www.gcis.gov.za/sites/www.gcis.gov.za/files/docs/resourcecentre/yearbook/2011/14_Environment.pdf)

Treat. J. (2006). Environment and Education. Rights and Responsibilities. Edit. Salim Vally. University of Johannesburg, The Center for Education Rights and Transformation (CERT). South Africa. P.2.

Torres-Carrasco, M., (1996). The environmental dimension: A challenge for the education of the new society. Environmental schools. Ministry of National Education. Colombia. 55.