



RESEARCH ARTICLE

EVALUATION OF TEACHERS' ENVIRONMENTAL COMPETENCIES AT 12 A UNIT, INSTITUTION DEPENDENT ON THE UNIVERSIDAD PEDAGOGICA NACIONAL, MEXICO

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ABSTRACT

The investigation was implemented at 12 A Unit, institution dependent on the Universidad Pedagógica Nacional (UPN) located in Chilpancingo, Guerrero, Mexico, in February 2016, its objective was to obtain an evaluation of environmental competencies that teachers have and therefore should be applied in the teaching-learning process. In this study, the necessary students' participation, because it contributes to strengthen this evaluation. This was made through a mixed, descriptive and comparative methodology, included, a process to select the sample, teachers and students, also, a Likert scale with variables, environmental issues, curriculum and competence, was applied to identify environmental competencies. Finally, results were described and compared. Teachers overvalue their environmental competencies and the didactic strategies, they implement in their teaching practice, in comparison to the assessment that the students gave them. The results will be argued in the design of an environmental education program to improve the substantive function "University teaching", this could be established in an institutional environmental plan to the 12 A Unit, Institution dependent on the of Universidad Pedagógica Nacional.

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INTRODUCTION

For almost 20 years, Nieto and Col. (1999), identified the need to incorporate the environmental perspective in all the baccalaureate curricula offered by Higher Education Institutions, as well as training programs, professional updating or continuing education in a that provide comprehensive environmental, human and social training that allows its graduates to make decisions as responsible adults and as competent professionals. In 2002, the Universidad Pedagógica Nacional offers the Bachelor's Degree in Educational Intervention in its 2002 Study Plan, it is based on the competency model and has been specified in the following levels: General competencies, which group skills, skills, abilities, values and activities of being, knowledge and professional doing; they are defined by the cognitive, methodological and technical integration that make up a professional profile, reflected in the eight competences proposed in the model.

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The specific competences bring together the knowledge, skills and attitudes of an occupational profile expressed in the six professional lines. The particular competences are those that correspond to each of the study programs and are constructed from a theoretical-practical division (UPN, 2002). At the Unit 12 A of the Universidad Pedagógica Nacional located in Chilpancingo, Guerrero, an Institutional Environmental Plan (IEP) is being designed; for this reason, this study was done, but substantive function (teaching) is part of (IEP). Institutional Environmental Plans express the political will of the Institutions of Higher Education to reorient their work towards sustainability and favor the increase of the quality of life of the population of our country. As a fundamental part, the substantive functions of the University should be environmentalized: teaching, research, management, extension and dissemination; With the objective of environmentalizing the substantive function of teaching, two surveys were carried out: one for teachers and another for students, so that the information could serve as a reference in the design of an Environmental Education Program, the objective was to obtain a self-assessment of environmental competences and didactic

strategies of teachers in the teaching-learning process and compare it with the results of the evaluation made by the students of their teachers. The results showed that the teachers overvalue their environmental competences and the didactic strategies that they implement in their teaching practice, in comparison to the assessment that the students gave them.

THEORETICAL FUNDAMENT

Due to the amplification of global warming, today we are suffering from floods in various parts of the world, caused by the accelerated melting of the Arctic ice sheet, as well as the melting of glaciers, the consequences of complex and non-linear changes in the Earth system are already affecting human well-being; the factors are multiple and interrelated, such as droughts combined with social and economic pressures, for example, that affect human security (UNEP, 2012); It is urgent to take measures in this regard, supported by the training provided by environmental education that, according to González (1998), is a process by which the individual becomes aware of his or her global reality, allowing him or her to evaluate the relationships of interdependence existing between society and its natural environment. In Mexico, in 1999, the National Association of Universities and Institutions of Higher Education (ANUIES) developed the first version of the Action Plan for Sustainable Development in Higher Education Institutions, a document that was enriched with the same survey Association applied between 2000 and 2001 among its affiliates in order to determine the educational actions related to the environment and sustainable development.

Environmental education in Mexico shows an increasing consolidation (Bravo, 2002). The achievements reached speak of trends of greater maturity in different areas of national life. The main features can be documented in various social spaces; On the one hand, there is a progressive presence throughout the National Education System, which also shows that firm steps have been taken in the field of organization and professional training, as well as in the national theoretical production in environmental education, among others. In this regard, several universities in the South-Southeast Region, have made diagnoses for the development of environmental plans, such is the case of the University of Chiapas that made its Environmental Plan with the aim that the University has a governing document that establishes the general guidelines aimed at promoting the incorporation of pro-environmental knowledge and values in the training of university students, as well as fostering in society the care and preservation of the environment and its resources, through the substantive functions of the university, to contribute to sustainable development.

Likewise, the National Pedagogical University of the State of Hidalgo (Mexico) developed an Institutional Program of Environmental Education for Sustainable Development. It should be noted that this Program is focused on carrying out training, updating, research, dissemination and extension programs in the field of education and environmental culture for teachers of different educational levels. An environmental education for sustainability, according to the model of competencies should consider constructivist theory and also teaching-learning strategies, these affect the goals of an educational model, because they affect the type of learning to be achieved. In this regard, Carretero (1993) argues: Basically it can be said that it is the idea that maintains that the

individual -both in the cognitive and social aspects of behavior and affective- is not a mere product of the environment or a simple result of its provisions internal, but an own construction that is produced day by day as a result of the interaction between these two actors. For students, to strengthen their environmental skills it is necessary that their teachers have knowledge, skills and attitudes for it. According to Aparicio, (2014) as shown at table 1, an environmental competency should have knowledge, abilities and attitudes on environment. In this sense, considering that the competency model goes hand in hand with an evaluation by competences, it is intended that the self-evaluation of the environmental competences of the teachers contribute information that allows strengthening the substantive teaching function; considering the function of this self-evaluation as Casanova (1998) mention, it occurs when the subject evaluates its own actions.

Therefore, the agent of the evaluation and its object are identified. It is a type of evaluation that every person performs permanently throughout their lives, as decisions are continually made based on the positive or negative assessment of a specific action, a work carried out, etc. It is intended that identifying strengths or areas of opportunity will make proposals that contribute to a better academic formation, so that students develop environmental competencies for the care of the environment. Likewise, since the students are the ones who evaluate the environmental competences of their professors, the hetero evaluation is being carried out, understood as the one carried out by one person over another: their work, their performance, their performance, etc. It is the evaluation that the teacher usually performs with the students, but in this case, it was the other way around, students to teachers.

METHODOLOGY

It is a descriptive, comparative study with a mixed approach. The population and sample is the following: at 12 Unit, UPN, 34 teachers work; the sample for the present study was obtained after making a review of the anthologies that included environmental contents, was detected that 5 of them contained them, we proceeded to survey 10 teachers who taught these subjects. School enrollment of the Bachelor in Educational Intervention (BEI) is of 352 students. The sample of the survey of students of the BEI was of 20 students chosen for convenience, whose selection criteria was according subjects that supposed integrate "environmental topics", as for example, contemporary social problems, socio-educational diagnosis, regional development and microhistory, environmental culture, these being a total of 60 students so it was considered that a third would be representative. Two instruments were developed, one for teachers and another for students with a likert scale: (Deficient, not acceptable, Good, Very Good and Excellent); the questionnaires contained the questions and statements presented in the following table: The information obtained by the instruments said was processed through Excel program.

RESULTS AND DISCUSSION

When asking teachers if they understand the environmental situation and its relationship with social issues, analyze and construct proposals to solve environmental problems that infer socio-economic and cultural attitudes and values to preserve the environment for development; 20% of the teachers

Table 1. Components of the environmental axis

Components of the environmental axis		
<i>Knowledge</i>	<i>Abilities</i>	<i>Attitudes</i>
<ul style="list-style-type: none"> • Build knowledge about the interrelation of air, water, soil and ecosystems. • Build knowledge about the natural resources of the state of Guerrero, Mexico and the world. • Build knowledge about the use of natural resources. • Build knowledge about the causes and consequences of environmental problems. 	<ul style="list-style-type: none"> • Analyze situations related to the environment. • Evaluates the environmental impact. • Develops sustainable development projects. • Applies methods to mitigate the effects of environmental problems. • Promotes the use of clean technologies (eco-technologies). • Works with creativity and scientific rigor in the solution of environmental problems. 	<ul style="list-style-type: none"> Value natural diversity. Shows respect for the conservation and care of the environment. Possesses attitudes of responsibility in the search for alternative solutions to environmental problems. Take initiatives in the construction of collective solutions.

source: aparicio (2014)

Table 2. Anthologies of licenciature in educational intervention with environmental contents

Learning unit	CONTENTS	COMPETENCES
Socio-educational diagnosis	Ecological elements: What are the physical and environmental conditions in which the phenomenon being investigated is developed and its influence on it?	Integrates contextual knowledge and application of the learning made in terms of research techniques and social theory to explore context variables.
Environmental culture	Cultural conditions, general conditions of the ecosystem, flora and fauna, pollution levels: water, air, soil, geo-physical conditions.	Identify environmental problems in your community as symptoms of crisis through intervention projects enabling changes in attitude toward the environment.
Regional development and microhistory	Mexico is a system that includes natural resources, soils and climates.	Integrate contextual knowledge, research techniques and analysis, to identify the Regional history.
Contemporary social problems	The world in which we live. What is globalization?	Identifies knows and characterizes in a critical, solidary and with a strong social commitment, contemporary social problems around subjects and social movements in the fields of economic, political, educational and environmental culture.
Creation of learning environments	Characteristics of school buildings and criteria generated for the use	Identify the notions that learning environments have psychology, ecology, sociology and communication.

source: self made

Table 3. Interrogants performed to teachers and students

INTERROGANTS TO TEACHERS	INTERROGANTS TO STUDENTS
I understand the environmental situation and its relationship with social issues, analyze and build proposals to solve environmental problems that infer socio-economic and cultural attitudes and values to preserve the environment for development	Your teacher understands that environmental problems permeate all social sectors (economic, cultural, education, health, etc.)
I know how to incorporate the environmental axis transversally in the development of the learning unit that I impart to my students	Does your teacher relate the objectives of the program of the subject or the topics of the program with environmental issues?
I have environmental competences (knowledge, skills, attitudes and values) to transversally develop the environmental axis in the subject I teach.	Does your teacher have the competences (knowledge, skills, attitudes and values) in environmental or socio-environmental issues?
Design educational strategies to promote environmental education or the environment in the teaching-learning process	Does your teacher reflect, analyze and construct pedagogical and didactic strategies so that the student relates contents of the subject that he / she studies with environmental contents?
I ask my students to turn off the light, the air, when they are not busy or put the trash in their place, keep the school clean, etc.	Does the teacher ask his students to turn off the light, the air, when he does not occupy himself or put the garbage in his place, keep the school clean, etc.?
Occasionally, I go out with my students to do field work related to the environmental axis, such as observing birds, separating garbage, giving talks about caring for the environment to other people, etc.	Occasionally, the teacher and student leave to carry out field work related to the environmental axis, such as observing birds, separating trash, giving talks on environmental care or other activities that are related.
Students promote environmental competencies with the development of environmental issues with a transversal focus on the subject I teach.	The professor performs works of the subject that he teaches and we attach the discussions to topics that have to do with the environment.

Source: self made

responded: deficient, 40% not very acceptable and 40% well, while the students evaluated them with 25% deficient, 35% not very acceptable, 30% well and only 10% very well, so we can observe that both students and teachers agree, that only 4 of the 10 teachers understand the environmental situation, this could be because the question includes solving environmental problems.

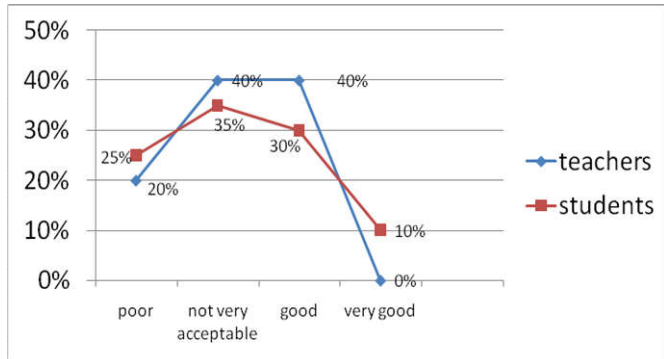


Fig. 1. They know how to incorporate the environmental axis transversally into the development of the learning unit that it imparts to its students

Teachers were asked if they know how to incorporate the environment axis transversally into the development of the learning unit that it imparts to its students, 40% (4 teachers) answered not very acceptable, 40% well and 20% very well. In this regard, students rated them as follows: 40% deficient, 40% unacceptable, 10% good, 5% very good and 5% excellent. Here we can see that while 60% of the teachers answered that if they know how to incorporate the environment axis only 20% of the students answered that their teachers if they know it, it is probable that in practice they do not show it.

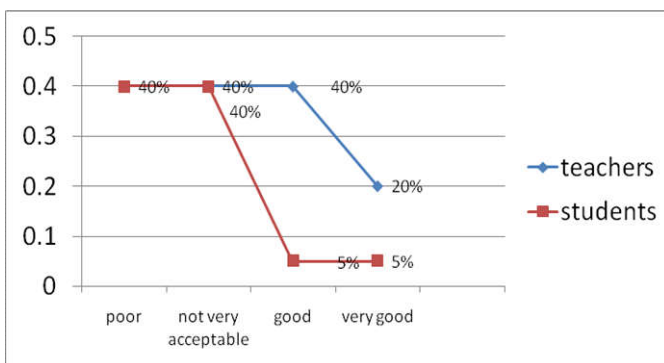


Fig. 2. Teachers know how to incorporate the environment axis

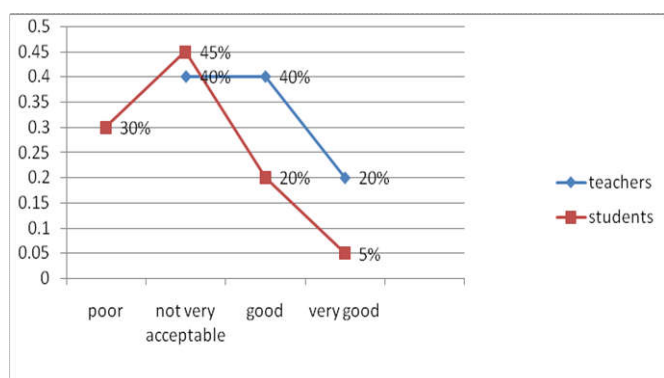


Fig. 3. Environmental competences (knowledge, skills, attitudes and values) to transversally develop the environment axis

From the question to the teachers: It has environmental competences (knowledge, skills, attitudes and values) to transversally develop the environmental axis in the subject taught: 40% not very acceptable, 40% well and 20% very well, However, only 25% of students agree with them.

The teachers responded to the question: Design educational strategies to promote environmental education or the environment in the teaching-learning process, 40% answered not very acceptable, 40% well and 20% very well. The answers given by the students to this question were 55% deficient, 20% unacceptable, 10% good, 10% very good and 5% excellent. In this sense, the assessment given by the students to their teachers is very low and therefore very different from the teacher's self-evaluation.

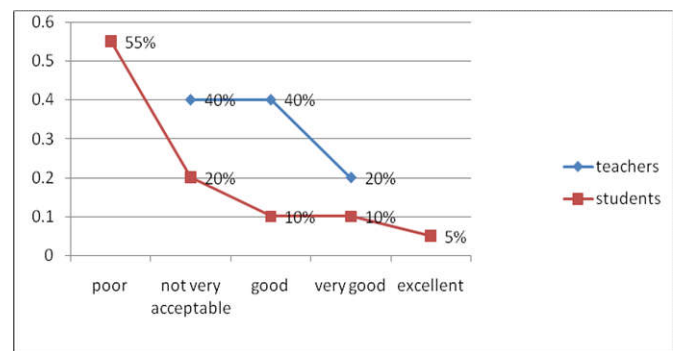


Fig. 4. Design educational strategies to promote environmental education or the environment in the teaching-learning process

When questioning teachers if they ask their students to turn off the light, the air, when they do not take care of it or put the trash in their place, keep the school clean, etc., 40% answered: well, another 40 % very good and 10% excellent; The same question asked the students showed the following results: in that sense we can deduce a minimum coincidence in the answer, because more than 50% of both teachers and students agree that teachers do these environmental actions in the classroom.

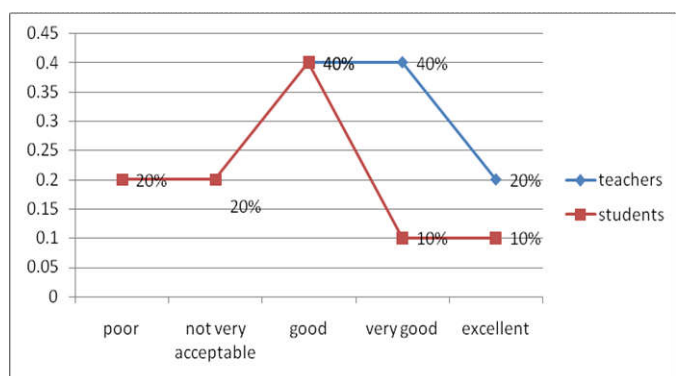


Fig. 5. I ask my students to turn off the light, the air, when they are not busy or put the trash in their place, keep the school clean, etc

The answer to the question: Sometimes, I go out with my students to do field work related to the environmental axis, such as observing birds, separating garbage, giving talks about caring for the environment to other people, Teachers responded as follows: 40% unacceptable and 60% well; the students answered: 40% deficient, 30% not very acceptable, 10% well, 10% very good and 10% excellent.

There is a great difference, this could mean that while the teachers comment on their fieldwork experiences with their students (of several generations), for the students surveyed, the fieldwork could be minimal or null.

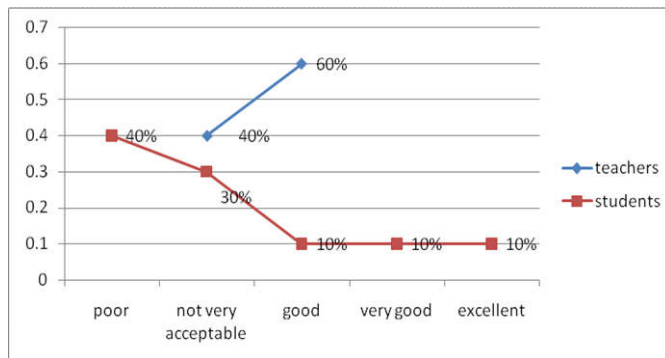


Fig. 6 Field work related to the environmental axis, bird watching, to separate garbage and talks of environmental care to other people

The teachers were asked: The students promote environmental competences with the development of environmental themes with a transversal focus on the subject I teach: 60% answered not very acceptable, 20% well and 20% very well, while the students: 40 % deficient, 30% not very acceptable, 10% good, 10% very good and 10% excellent. Here we can observe that there is a greater coincidence in the answers, which serves as an argument for the relevance of the design of the Environmental Education Program for the students.

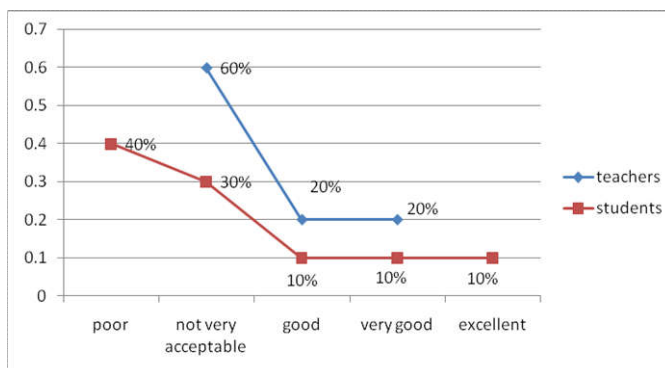


Fig. 7. Students promote environmental competencies with the development of environmental issues with a transversal focus on the subject I teach

The results of this research show that there is an overvaluation of teachers in relation to their environmental competences and didactic strategies that they implement in their teaching practice, in relation to the evaluation provided by their students and therefore both in teachers and in students the environmental competences they need to be strengthened; According to the research conducted by Sosa *et al.*, (2010) to students of the University of Campeche, the results indicate that students have a low level of environmental culture and lack the knowledge and skills necessary to make environmental changes favorable in their lifestyles. It is emphasized that the institutional context operates as a factor that inhibits environmental education because environmental training is not considered a priority and therefore there are no spaces, infrastructure and the necessary supports for its study, teaching and promotion.

In this regard, Lara *et al.* (2010) state that the causes attributed to environmental problems are mainly due to cultural causes - unconscionable, lack of education and irresponsibility-; followed by economic causes - over-exploitation-; policies - corrupt government; technological - factories and cars; overpopulation and urbanization; social and natural The students mention that there are no frequent academic responses and the passage through the university has little influence on the representation that students have on the causes of environmental problems, it is found that the university and mainly the curriculum serves to a lesser extent the environmental dimension .

Conclusion

The Universidad Pedagógica Nacional has distinguished itself since its creation decree as a training institution for education professionals, this requires that it strengthens all its substantive functions (teaching, research, management, extension and dissemination) in relation to the environment axis, since their graduates of the Degree in Educational Intervention will be able to influence in several educational fields, because the socio-educational intervention can attend the cultural, social and educational modalities. The areas that can be affected are: free time; adult education; specialized education and socio-occupational training, which includes areas such as environmental education, health, peace, adult, permanent, compensatory, for the elderly, for the media and community development (UPN, 2002), without However, it is worrisome that almost twenty years ago it was identified as a need to include the environmental axis transversally throughout the curriculum, it has not yet been possible to cover it; It is necessary to propose pedagogical strategies that strengthen both the work in environmental education and the training of teachers in the area. Therefore, the results obtained in this research are valid arguments for the design of an Environmental Education Program that includes the strengthening of teaching strategies for the participating actors, since the teacher's performance as an environmental manager requires the development of skills to plan, organize, undertake actions, evaluate, monitor the generated processes and systematize and disseminate the experiences that are generated for the solution of environmental problems. The relevance of the role of teachers is the responsibility and dedication in the educational task, it is he who puts into practice the plans and study programs designed specially to promote the overall development of students. The limitations of this study is that it was only a comparative and descriptive study, more quantitative than qualitative, the latter because the sample selection was convenient for both teachers and students; the previous thing would be strengthened with an interview to the teachers that reflects its experience in the pedagogical and didactic scope, as well as the knowledge about the subjects related to the care of the environment, will be interesting to obtain from the teachers its commentaries about the barriers and facilitators to strengthen environmental competences, and comply with the transversal focus of the environmental axis in the Bachelor's Degree in Educational Intervention.

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