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*Artículos Científicos*

## **La capacidad de acción como formadores ambientalistas de universitarios**

### **The Ability to Act as an Environmental Educator for University Students**

## **A capacidade de ação como formadores ambientalistas de estudantes universitários**

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## Resumen

Este trabajo comparte el ir y venir dialéctico de experiencias y estados de ánimo de algunos docentes ante la dificultad de estar a la par de la alta industrialización que la “civilización” ha traído a América Latina.

Conscientes de que la enseñanza de las ciencias sociales requiere necesariamente la contraparte comunitaria, la interacción de los alumnos con las personas de las comunidades se vuelve parte de la estrategia didáctica. Se genera, entonces, la enseñanza a través de dos vías: la de la escuela hacia la comunidad y, la más fuerte, la de la comunidad hacia la escuela. En este esquema, la construcción de la ciudadanía va de la mano con el proceso educativo sustentable al reconocer las contrariedades ambientales como comunes.

El proceso educativo comprende al desarrollo sustentable en sus tres dimensiones: social, económico y medioambiental. Lo medioambiental se vuelve el tema a enseñar, pero debe entenderse dentro de lo económico para considerar sus posibilidades. En el aspecto social, la construcción de una ciudadanía global reclama el conocimiento profundo de la cultura e historia de la comunidad, de alumnos y docentes. La combinación adecuada de todas ellas consolidará el capital social de la comunidad de aprendizaje. Esta investigación se base en las apreciaciones de un grupo de estudiantes universitarios del estado de Yucatán, México, respecto a cómo la comunidad ha influido en su visión profesional. Las preguntas de investigación que surgen de manera inmediata son: ¿Los conocimientos y teorías impartidos en la actualidad son suficientes para estar al nivel de la realidad? ¿Las acciones que propiciamos son las mejores, las más asertivas y acordes con lo que el contexto exige?

**Palabras clave:** alumno, ciudadanía sustentable, comunidad.

## Abstract

This work shares the dialectic coming and going of experiences and states of mind of teachers faced with the difficulty of being equal to the high industrialization that "civilization" has brought to Latin America.

Aware that the teaching of the social sciences necessarily requires the community counterpart, student interaction with people in the communities becomes part of the didactic strategy. The two-way education is then generated: from the school to the community and, the strongest, from the community to the school. In this scheme, the construction of citizenship goes



hand in hand with the sustainable educational process, recognizing environmental setbacks as common.

The educational process includes sustainable development in its three dimensions: social, economic and environmental. The environmental becomes the subject to be taught, but it must be understood within the economic model to consider its possibilities. In the social aspect, the construction of a global citizenship demands a deep knowledge of the culture and history of the community, of students and teachers. The appropriate combination of all of them will consolidate the social capital of the learning community. This research is based on the findings of a group of university students from the state of Yucatan, Mexico, regarding how the community has influenced their professional vision. The research questions that arise immediately are: The knowledge and theories taught today are enough to be at the level of reality? Are the actions we favor the best, the most assertive and in accordance with what the context demands?

**Keywords:** student, sustainable citizenship, community.

## Resumo

Este trabalho compartilha a dialética indo e vindo de experiências e estados de espírito de alguns professores diante da dificuldade de estar em sintonia com a alta industrialização que a "civilização" trouxe para a América Latina.

Consciente de que o ensino das ciências sociais exige necessariamente a contrapartida da comunidade, a interação dos alunos com as pessoas das comunidades torna-se parte da estratégia didática. O ensino é gerado, então, de duas maneiras: da escola para a comunidade e, mais forte, da comunidade para a escola. Neste esquema, a construção da cidadania anda de mãos dadas com o processo educacional sustentável, reconhecendo os reveses ambientais como comuns.

O processo educacional inclui o desenvolvimento sustentável em suas três dimensões: social, econômica e ambiental. O ambiental torna-se o sujeito a ser ensinado, mas deve ser entendido dentro do econômico considerar suas possibilidades. No aspecto social, a construção de uma cidadania global exige um profundo conhecimento da cultura e da história da comunidade, dos alunos e professores. A combinação apropriada de todos eles consolidará o capital social da comunidade de aprendizagem. Esta pesquisa é baseada nas descobertas de um grupo de estudantes universitários do estado de Yucatán, México, sobre como a comunidade influenciou sua visão profissional. As perguntas de pesquisa que surgem imediatamente são: O conhecimento e as teorias



ensinadas hoje são suficientes para estar no nível da realidade? As ações que favorecemos são as melhores, mais assertivas e consistentes com o que o contexto exige?

**Palavras-chave:** estudante, cidadania sustentável, comunidade.

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## Introduction

From the classroom, environmental educators strive for students to acquire identity with nature. At present, however, this topic is not important for its formation and enrichment in a formal and informal way (at least in the Mexican educational system). University curricula have created school and extracurricular teaching strategies that allow Latin American students to recognize themselves as part of the world once again. But what world are we talking to our students? The answer may be in line with Dussel's (2000) vision: "The Eurocentrism of modernity is exactly having confused abstract universality with the concrete worldliness hegemonized by Europe as the center" (p. 29). And in that sense, as Lander (2000) affirms, this civilization is questionable as a model for our America:

The most powerful expression of the efficacy of modern scientific thinking, especially in its technocratic and neoliberal expressions today hegemonic, is what can be literally described as the naturalization of social relations, the notion according to which the characteristics of the society called modern are the expression of spontaneous, natural tendencies of the historical development of society (p. 4).

This is important to clarify because it indicates from where we are placing students to appreciate a consensual reality. Those who are involved in environmental education sometimes experience failed situations to ensure that young people, who are our best listeners, learn and take responsibility for the care of the environment. Our alarmism fails before the non-impacting circumstances of reality.

We transmit disturbing knowledge and information with the purpose of alerting and involving them to action, if possible, so that from their countries they take care of and defend their habitat and nature in general.

However, in practice, the effort to reforest school areas or to do environmental work in a certain urban colony leaves the feeling of strangeness or futility at the news of an atomic test in the Pacific, or the spill of thousands of liters of oil in the gulf How to explain the intentions of

territorial appropriation by the United States that led to the coup in Honduras and the establishment of the seven military bases in Colombia. Suddenly, and in the face of that reality, environmental education in the university classroom is losing its way, at least from the capacity to respond to its purposes in the face of environmental aggressions of such magnitude. In the sense that from the efforts of environmental education there is much that can be done as individuals and at the community level, although we cannot control the political decisions, such as the aforementioned examples, which will ultimately also have an impact on our environment.

Given the above, the research questions that arise immediately are: Are the knowledge and theories taught today enough to be at the level of reality? Are the actions we promote the best, the most assertive and in accordance with what the context demands?

Today, this concern is a question that hangs over the environmental issue of the educational process. The big polluters make the informative or minimal action school entrepreneurship almost absurd. Even the fact of being so innocent and romantic can be considered a distraction from the real problem, from the main premise, from the problem of naturalized pollution in the production-consumption-production formula. From that model of life based on goals of production-money that does not care about the indiscriminate use of natural means or their consequences, only the ends of the great industrial society of which we are part as consumers. Hence the title of this work: How to be a university environmental manager and educator. Tangled up in these concerns, in the search for answers that allow us to stand before our students at the height of reality, we have been building a dialectic and popularly a society of hope.

We say awareness when, attached to Andreu (2009), we approach communities respecting their personal and social hierarchies and values. Where at the same time students, teachers and people of the community, social empathy is founded, and whose results are reflected in how they modify each and every one in their dealings and visions of the world, to improve their immediate context.

In this sense, we consider university training as a priority role in these changes in values; as an organism responsible for educating, training and introducing a change of attitude towards the environment, through a new conception of environmental education and training. This is because the university context is where a large part of the training of technical and management professionals is developed, and, taking into account the responsibility that these professionals have directly in any of their specialties on the environment, the need arises to introduce sensitivity, commitment and environmental knowledge into their training. Environmental sustainability, some authors in the area propose, must be a transversal competence. A topic that teachers should



introduce in the design of their programs even if the subject is not directly linked to these topics. And even though some curricula of the new bachelor's degrees offer the opportunity to introduce them, not all teachers have knowledge or ideas on how they can develop the “environmentalization” of their subjects, or in other words, how they can contribute to the training and pave the way towards the sustainability of the new graduates and ignore the level of environmental training that students require (Azapagic, Perdan y Shallcross, 2005).

Environmental education is a subject that has traveled slowly to be included in the university curriculum. Research conducted in higher education demonstrates the poor training and sensitivity that young people have to face the current environmental problem. The main premise is that one of the aims of higher education is to respond to the needs that society demands by forming professionals committed to values and knowledge to achieve a better life and human environment. The environmental crisis facing global society is growing, natural resources continue to be exploited and alarmingly reduced and university education programs lack transversal knowledge to deal with it. (Ortiz, 2014).

### **Yucatan in the environmental context**

Unlike Europeans, the Maya are not made of mud but of corn. Hence their strong identity with nature: they are plants from their worldview - which still prevails in their imaginary and is evidenced in harvesting and hunting practices. In addition, they are not distinguished from any hint of nature. The sacred book of the Maya, the Popol Vuh (1992), reveals this lost relationship:

And so they did, they blessed the food that was watered in the lap of those places. Then they said prayers whose resonance was spreading over the face of what was created as a burst of alhucema that filled the air with good aromas. (...) These animals brought the news that the yellow, purple and white corn cobs were grown and ripe. By these same animals the water that would be put in the threads of the flesh of the new beings was discovered. When all that was said was revealed, the cobs were shelled, and with the loose grains, desleados in serene rainwater, they made the necessary drinks for the creation and for the prolongation of the life of the new beings. Then the gods worked the nature of these beings. With the yellow dough and white dough they formed and shaped the flesh of the trunk, arms and legs ( p.4)

Here, in Yucatan, where the imaginary gave rise to the human being of yellow and white corn emerged from the earth, today there is very little of these ideas in our students in a hurry to have a profession and improve their ways of life. For them it is important to change status, not to preserve that miserable and future-free way of life in the countryside that European colonialism transformed into devastation and modified the essence of family farming to the model of land exploitation for commercialization.

In some way, the misery in which the inhabitants of the rural areas were plunging, some called Mayans, continued in free Mexico, even post-revolutionary. It is unfortunate that their pre-Columbian worldview, which identified them with nature, was set aside under the European civilizational concept that prevailed through positivism and, subsequently, in an indigenism that fostered the recognition of culture but did not privilege the forms of independent subsistence and created a symbiosis of indigenism-misery. And he left as a solution what is known as the social engineering task of revolutionary governments:

They incorporated the recent anthropological approaches of indigenism and cultural nationalism, considering that they were the ideal projects to transform the people and integrate the Indians with the rest of the national society through educational acculturation and racial mixing (Mijangos y López, 2011, p. 46).

It is not strange that today the identity that existed between the natives and the environment no longer exists among our master students:

In this context, education, institutional anthropological discourse and, soon, the media such as radio and the press in the 1930s, were important channels for spreading the current that made the mestizo the ideological symbol through which the aspirational Indian would be integrated into the national society (Mijangos y López, 2011, p. 46).

Next, a review of the background found in the literature that presents concrete cases of environmental education practice will be presented.

### *Similar scenarios*

However, this separation of the natural world, of creating two worlds, that of men and that of others, is the result of a social process. In this regard, from an interview, Descola (Corradini, August 23, 2006) shares his experience with indigenous groups:

The separation of man from nature was done in stages. The first goes back to the ancient Greeks, with the invention of nature as physis: an object of investigation



that is not subject to divine whims, but to laws that make nature predictable. Christianity marks the second stage of transcendence, which implies, at the same time, exteriority with respect to the world of the Creator and of man, since God has reserved a special status for him. The third stage is the scientific revolution of the 17th century: a way of framing the world with inventions such as the microscope, the telescope. Nature then became autonomous and observable (párr. 15).

It is possible to add, mainly for the social sciences, the origin to the distinction of the subjective and the objective, which creates a distance between the same men, to the methodological principle and then philosophical. The scientific appropriation of the external observer once again leaves man out, highlights, privileges and confuses him with us and others.

As Pizarro (2001) puts it from the speech rehearsal:

At the beginning of the new century, vulnerability has become the dominant social feature of Latin America. The predominance of the market in economic life, the economy open to the world and the withdrawal of the state of the functions that it had in the past caused a major change in economic-social relations, in institutions and in values, leaving exposed to insecurity and helplessness to broad layers of middle and low income population in the countries of the region.

Especially in Yucatan, where the new invasion of foreign capitals has appropriated the productive sectors in the countryside, and has turned the peasant into an agricultural employee, right there, where his lands used to be. Therefore, the man-nature relationship that characterized the people of these regions has been fading before the need to survive. Now we are a place where it has become a priority to survive in the face of identity and love for nature.

How to turn this reality into teaching? What is the best strategy to raise awareness? This is the search for the next item.

### *The university in sustainable development*

The Autonomous University of Yucatán (UADY) is committed to forming social skills in students to respect cultural diversity among individuals and social groups, as well as to develop strategies for the dissemination, respect and adoption of universal ethical values. Criteria that, within the university social responsibility scheme that has been proposed, move in the fields of education for sustainable development with aspects of environmental management, responsible consumption and preservation of the Mayan culture. Although the elements of environmental



identity that characterized the imaginary of the universal unity of pre-Columbian culture remain absent, where all human beings are part of that unity, now known as nature.

The UADY recognizes the impact of its decisions and activities on the training of its students, society and the environment, through a transparent and ethical conduct that is consistent with the sustainable development and welfare of society.

In this regard, the UADY mission points out the following: “It provides a space for critical analysis and reflection on global, national and regional problems, leading to the sustainable development of society”.

This demonstrates the willingness of the university to put the talent and potential of its students and professors in favor of innovation to support the updating of companies that are interested in enabling their productive activity or services to be friendly to the environment.

In this way, this university institution presents a favorable climate for addressing environmental actions; climate that strives to build by example.

### *Favorable student characteristics*

Given the socio-cultural and historical characteristics of the students attending UADY, the purposes of reality that we intend to bring the student closer are facilitated. This is a subject within the historicity of his daily life, it is the result of the historical accumulation of the popular knowledge of his community and family experiences. Classmates add to this contribution of reality: they keep stories of life, of shared dreams, of struggle, of hope. They are living realities, possible possibilities, they are there, in the classroom, at hand, as a challenge to the capacity for abstraction and science. If we are cunning we will see the immense possibility of strengthening that resource.

The greatest risk lies in Freire's observation of preventing the oppressed by improving their status from becoming oppressors. What Marx pointed out as the declassification or loss of class consciousness.

### **Educational project for the formation of ecological awareness**

We know that practice makes perfect. Many pedagogues and philosophers of education suggest and recommend that the guarantee of education as a transformative instrument be praxis, the field work that allows the student to learn by discovery from reality.

We have a comment from Freire (1971) about it:



I never accepted that educational practice should be limited only to reading the word, reading the text, but should include reading the context, reading the world (...). True education is praxis, reflection and action of man on the world to transform it. Education in each country must become a political process, each subject makes politics from whatever space they are in and the classroom cannot be indifferent to this process. (p. 18).

So: How have we done so that environmental education is not a fiction? Or rather: What have we done for the student to see from their reality and not just as a compulsory subject?

It is key to contextualize and be honest; locate the environmental action in the dimension that corresponds to it within the great complexity of sustainable development. Let it be clear what is of man and what is of God, that is, what corresponds to us and we can do from the university approach - which no longer revolves - and what is beyond our reach, what concerns other areas of decision making. Sometimes, to the question of some student of what he can do in the face of climate change, the most assertive answer is the following: "Start at home." Leave aside the megalomaniac ideas of saving the world, for possible actions of an immediate life better than in your hands, within your means. Obviously this is a non-generalizable but practical example.

And, above all, it is important to do it through practices originated in Latin America. Through examples such as the "Declaration of Tiquipaya" in Bolivia, where the commitment to defend the land is the task of each farmer in that country

In addition to projects such as "Strengthening the productivity of peri-urban productive enterprises through training and technical and organizational innovation in Greater Buenos Aires" (Cieza et al., 2013).

The agreements of San Andrés in Chiapas, which were seeking, the latter, "to ensure indigenous people an education that respects and takes advantage of their knowledge, traditions and forms of organization", according to the Joint Statement that the Federal Government and the EZLN will send to the instances of debate and national decision, January 16, 1996.

Likewise, Fernández (2003) underlines the ecological vision of the Zapatista movement: Although the rebel group has not only focused on the sustainable management of natural resources, its organizational model is laying the groundwork for it and has been a key actor so that Chiapas biodiversity has not been voraciously exploited by the state and the market. (p. 213-265).

Both projects are programs that cover training in globalized skills, but also add aspects of the field (Caduto, 1992, p. 28)



## Community action

Nothing could be achieved if our students were not what they are. Most of the young people who attend our classrooms have community identity, that is, they still live in rural communities, or they are the second or third generation that left those communities. The most interesting and valuable thing is that they demonstrate their roots by having contact with the community and sometimes participating in customary practices of them. In that way, they become the first teaching resource for the rescue of knowledge.

Social educational praxis implies the relationship of subjects-subjects. It is the only possible combination. Approaching subjects come into contact with others with the intention of causing an effect on them, where inevitably, as a result of social action, the relationship becomes dialectical, where double causality reflects the dynamics of the interaction (Schrodinger, 1998; Sassano, 2006).

Teachers, aware of this didactic need, to give a sense of reality to education, devise strategies that allow the student to come into contact with that reality. This contextualization educational process is usually based on bringing students closer to reality. Tasks are planned to be carried out in alternative contexts, which the teacher conceives as externality.

### *Project "Clean school in a clean environment"*

The UADY School of Education project entitled "Clean School in a clean environment" aims to bring students closer to the deep ecology rooted in the Mayan worldview through academic activities that involve them and allow two academic-social objectives to be achieved : that they apply their knowledge and do so by actively participating with people from the communities, mainly colonies near the faculty. These are settlements of people who come from rural communities in which social empathy between them and us is sought, understanding this, empathy, as the identification that is generated in a subject from its interaction with people from the communities, where they need to understand their circumstances and actions from their social perspective.

The project that has been implemented by the UADY Faculty of Education involves students as university environmental promoters (PAU) and people (children and adults) from the colonies that are part of the environment of this unit. It is based practically on an educational



strategy, perhaps, if we analyze it, it is even a model, and consists of three methodological strategies:

1. Its starting point is the new theoretical construction that exists on sustainable development, theories, international commitments, cases as examples of rescue of the holistic worldview. Here we rely on the first phase of reception learning based on the theory of meaningful learning by David Ausubel (Díaz, 2002). That is, we do not rule out the recognition of popular knowledge that Souza mentions, nor the recognition of the possibilities of the historical subject that Zemelman points out (Díaz, 2002).
2. It promotes empirical initiation for the appropriation of concepts, so that what has been learned theoretically finds its significant learning substrate through direct action. Here the student's learning is supported in Ausubel's theory of meaningful learning, as well as in the Smith-Sebasto scheme of learning by doing-living.
3. The most developed phase, that of reproducing its commitment and worldview in other subjects, of community work that engenders the social empathy necessary for the construction of common belonging, of discovering that theoretical knowledge has a relationship with reality and acting accordingly. Sharing the commitment. That Vygotsky (Díaz, 2002) points out with his theory of social learning. It is the idea of a process that involves both who teaches and who learns; It does not necessarily refer to situations in which there is a physically present educator.

Thus, the constructivist conception of school learning is based on the idea that the purpose of education provided in institutions is to promote the processes of personal growth of students within the framework of the culture of the group to which they belong.

A formal course was given as an optional subject called Environmental Education. The first phase of this course was the theoretical part about environmental education: history, concepts, etc. Subsequently, the students gave an ecological summer course to the children of the surrounding colonies the faculty already specified. At this time they had the opportunity to apply their theoretical knowledge as educators in environmental education issues and were able to verify, as they concluded, that their knowledge made some sense to promote meaningful learning in children about the environment and its conservation.

The next step was the realization of the "Citizen's Day", which included encouraging residents to actively participate in a campaign in their own neighborhood by cleaning their sidewalks.



The above is based on the theory of constructivist learning to learn by supporting the method. In addition to the above, Ausubel's theory (Díaz, 2002) indicates that learning has greater permanence if it is significant, and this is valuable for formative and attitudinal processes, as is the case of the citizen participation environmentalist project, and that it involves also to the children. In this last aspect the permanence of the project is based with the theoretical elements of Montessori (1969). This project, in its third phase, that of the reproduction of human resources, training it as an ecological agent through participation and action, has allowed citizens to participate in cleaning activities in their neighborhood, as already mentioned.

What was really propitiated was learning propositions. This type of learning goes beyond the simple assimilation of what the words represent, combined or isolated, since it requires capturing the meaning of ideas expressed in the form of propositions.

The learning of propositions implies the combination and relation of several words. Each of which constitutes a unitary reference. These are then combined in such a way that the resulting idea is more than the simple sum of the meanings of the individual component words, which produces a new meaning that is assimilated to the cognitive structure. That is, a potentially significant proposition, expressed verbally as a statement that has denotative meaning (the characteristics evoked when hearing the concepts) and connotative (the emotional, attitudinal and idiosyncratic load caused by the concepts) of the concepts involved, interacts with the relevant ideas already established in the cognitive structure and, from that interaction, the meanings of the new proposition arise. In this case of seeing the real world from the perspective of learning; of the school useful for humanism.

## Objective

Identify the teaching practice that strengthens environmental training in university students

## Method

Focused on the teaching process in ensuring the understanding of their reality, and when asked about the best strategy to raise awareness among students, it was decided to evaluate the teaching practice and, in turn, the following questions were asked Research: Are the knowledge and theories taught today enough to be at the level of reality? Are the actions we promote the best, the most assertive and consistent with what the context demands?



The environmental project that is implemented in the Faculty of Education is closely related to citizen participation. That is, everything that is done is done in the community (real scenarios) and in direct coordination with the people who live there. That is why four levels were considered, and taking into account those two groups involved: students of the Bachelor of Education and people from the community.

The first level, "Ecological foundations", refers to the provision of basic information on the subject (basic ecology, earth systems science, geology, meteorology, physical geography, botany, biology, chemistry, physics, etc.) and the inseparable relationship of all nature and the rules that unite them and allow them to be such. This level applies to students, but we do not use it in the first instance with the people of the community, because we know of its little practice in memorizing concepts and in formal thinking. We expect a next level so that, through practice, they acquire the concept. The use will be evaluated with a classic questionnaire. Everyone must meet the passing criteria of 70, but the satisfactory criteria for the next level is 90.

"Conceptual awareness" is the second step. At this level it is intended to be understood that, within nature, the human factor is of great weight and that it can be as decisive for its species as for the rest of the world. Basically you must understand how human actions affect the rules and how knowledge of these rules can help guide human behaviors. Also here it focuses only on students, because the population hardly has a holistic view of the situation, even because the basic concept of pollution does not relate it to their daily lives. It is encouraged that students make observations in their environment about the conditions that exist for environmental pollution. You are asked to conduct an interview with family, friends and neighbors about what they understand by environmental pollution and how much of the pollution is their fault. It is evaluated with an instrument in which the student is required to identify the rules of the ecosystems to be such and to explain how the variation of any of them will result in the imbalance or disappearance of the ecosystem; also, to determine its degree of appreciation in the three areas of pollution: air, water and soil.

The student has to determine the role of human beings in the world based on their interviews and theoretical information. As a final activity, it will determine its ecological footprint as a starting point to understand the summation impact of all and use examples.

The third level is entitled "Investigation and evaluation of problems". Here we had to treat it differently because, given the indication to learn to investigate and evaluate problems, we use the participatory action research (IAP) method, where the participant subject determines the response capacity. In addition, the choice of the problem from the perspective of the participating



subject was added to this level. And the choice of the problem from the real perspective of the subjects was also added to this level. The community has an apparent passivity; Students move through it, but the ease of doing so is attributed to the ability to socialize the community. The point of coincidence of the IAP between the interests of the community and the actions of the students is the guideline for reaching agreements with the people of the community on which activities both can commit. A student perception questionnaire on the degree of intervention in the environmental problem of the community was used.

On the next level lies virtually the entire environmental education project that was implemented.

“Action capacity” focused on developing students' abilities to devise strategies for solving the environmental problems detected in the IAP. It is here where citizen participation is relevant, without it there is no action. Also, at this level, through action, doing practical things, these people achieve the objectives of levels one ("Ecological Foundations") and two ("Conceptual Awareness"); the sum of both is decisive for the achievement of level three ("Investigation and evaluation of problems"). This was measured by defining both the capacity for action and the level of involvement that the student demonstrated from three ranks: low, adequate and high. Appropriate was when the student completed on time and in form (number, distance, days) with the assigned task, and considered in advance the degree of involvement. Low meant the failure of the task or that it was not done in time or form. High, finally, refers to when it exceeded the criteria of the assigned task, for example, interviewing a certain number of people in one day and interviewing another one; or, given the commitment to remain in the community for a certain time, and remain more than agreed, or on occasions when the student made suggestions of other activities not contemplated in the initial project, etc.

An instrument was developed in which students participating in the Environmental Education subject were questioned about whether the knowledge and practices of the course had allowed them to understand their role as professionals in the environment. The teaching strategy adhered to the contribution of Smith-Sebasto (1997), who conceives that "one can teach concepts of environmental education, but not environmental education", through the four formative levels already specified.

The activities of level one were based on subjects of the Bachelor of Education designed for it and the objective was reached when the students acquired the knowledge on the basic ecological foundations.



Level two is achieved when students understand that within nature the human factor is of great weight and that it can be as decisive for their species as for the rest of the world. In this regard they were given some theory about international agreements and commitments, as well as the respective national regulations, and were asked to exemplify how human actions affect the rules. When determining their ecological footprint, they explained the possible environmental impact of all participants in the subject and extrapolated this information to make an assessment of the environmental impact of all ecological footprints. Subsequently, knowing that the human being voluntarily aggravates the environment, they were asked to make three proposals on what to do from three dimensions: educational, administrative and political.

Level three, "Research and evaluation of problems", required restructuring the concept of researcher-scientist that brings the student: practically change his attitude of subject that is related to an object, in this case, people from the community. They wanted to understand that the one who determines what to study is the subject, and this changes the traditional expectation that the student has, that the one who does know what to investigate is the scientist. They were taught to use the IAP for this purpose. This implied great passivity and patience on their part because the community has its own response rate.

Once they learn to investigate and evaluate problems based on the IAP method, when they get people to participate and deduce their own problem, students, as facilitators, obtain, through exercises designed by them under this model, relevant information of the community.

When we say that at the level entitled "Capacity for action" lies virtually the entire environmental education project that was implemented is because the degree of involvement after the student discovers what the IAP is able to give the project must be magnified. Therefore, they are asked to decide what they are going to do in the community now knowing in advance that nothing can be planned independently and without the knowledge of the people they worked with. This really determines the student's capacity for action: to promote and facilitate citizen participation. They develop strategies to promote and facilitate participation, specifically specifying actions, place, date and duration of the activities, as well as what will be the participation of the people of the community and their own intervention to solve specific pollution problems. Subsequently, intervention actions are carried out as planned.



## Results

Regarding the first level, the students demonstrated having acquired the basic knowledge (ecological foundations). However, although they reached the passing grade (70), the minimum grade to pass to the second level was 90, and this criterion was only reached by 21 of the 25 students.

Although all continued, the consequences that this represented for the four lagging students were appreciated at the next level; Although they did not find it difficult to observe their environment in the interviews they conducted, they had interpretation deficiencies. On the contrary, the 21 students with satisfactory criteria were able to observe the problem and their interviews addressed the three aspects of pollution. When applying the instrument in which the student has to determine the role of the human being in the world, the group of students with satisfactory qualification identified the rules of the ecosystems to be such, and explained how the variation of any of them brings as a consequence the imbalance or disappearance of the ecosystem. It also determined its ecological footprint as a starting point and was able to explain the summation impact of all of them based on the interviews carried out. The other four students were involved in a different process than the project.

At level 3, by applying the questionnaire to measure the students' perception of the procedure, objectives and scope of the IAP applied in practice and their assessment of the degree of intervention in the environmental problem of the community in each of its phases, of the participants, 98.7% recognized that the IAP procedure is the one to obtain relevant information about the community; 97.1% affirmed that the objectives proposed by the method were achieved, and 100% said that the IAP is the most recommended method to carry out community work, to determine environmental problems and to compromise citizen participation to solve them.

Level 4, "Action capacity", the level of involvement that the student demonstrated from the three ranges already broken down was measured based on the actions. The results obtained determined that, at the time of carrying out the activities in the community together with the people, 71.4% obtained high rank; 14.2% mid range and 14.2% low range.

## Conclusions

This work meant the experience of a maturation process in the four levels of an environmental awareness development project, whose planning and systematization required real learning scenarios with students and people in the community.

The whole process of discovering, doing and correcting in favor of the environment is in itself the process of shared teaching-learning and, consequently, the quality and result of situated cognition.

The students acquired ecological knowledge and were able to use them to arrive at the analysis of the impact of their ecological footprint on the environment. The last lesson is that students detect that many of our environmental problems, in this case, really are the result of everyone's collective action. They are basically social problems, of them, of us, of everyone, and to dominate and prevent them is also a matter of each of those who make up the community.

The development of level 3, and the students' perception of the IAP method, ratifies this method as the ideal one for when it is required to involve the community. It is a recommended method to carry out community work if the purpose is to determine environmental problems and to compromise citizen participation to solve them.

The last level, "Capacity for action", leaves great satisfaction because it allows, through a process of involvement, the student generates in itself the responsibility and social commitment expected of a university professional. This is the truly revealing stage of the project on the generation of environmental awareness because it allows both students and non-students, through practice, to participate in actions that they recognize as important to protect the environment. This participation process proves to be successful from the systematic analysis of the situation of the community and the accuracy of fixing a problem independently, as well as from the fact that the role of the university students was only that of facilitators, who called the meetings They gave the floor and pointed out the agreements made by the community.

Actually, the role of the university was to cover those gaps that people in the community tend to leave very accustomed to *laissez faire*, carefree of time management and sometimes alarming passivity that can end, from the beginning, with any project. People who do not aim, perhaps because of their low education or because they have never given importance to that. That was the role of the students who participated in this environmental project. Therefore, it allowed the student to recognize the weight and importance of citizen participation. Determined the



student's capacity for action to promote and facilitate citizen participation. He demanded the development of strategies to encourage and facilitate participation to achieve what was proposed.

This practice in real learning scenarios, of on-site learning, between the community and the school, reveals factors that should be considered when environmentalist actions are carried out, such as ensuring that the curriculum encourages learning situations in real spaces to create a scheme in which all participants benefit. In this particular case, students were first identified, who in real situations learn significantly and give useful meaning to their training, knowledge acquires practical nuances and allows them to contrast theory and practice and, in addition, by putting their competences at the service of others reinforce their humanistic formation.

Similarly, the neighbors, in general, because they strengthen ties of closeness between them and are built as a team for the achievement of common goals. The already organized colony can take environmental team actions that favor everyone. There are also teachers, because working in real situations legitimizes their teaching and feeds on students and people in the community. Likewise, the Faculty of Education because it fulfills the manifest function in its Mission of service to the community. Finally, the UADY, because it meets the expectation of being a public institution with extension to the community.

This is an innovative project based on the socio-cultural characteristics of the students that allowed to involve people from the community. The results were favorable for professional training with a vision of sustainability. The interaction in real community learning scenarios. Ad hoc subjects for training objectives in environmental education were consolidated. What is an achievement, so this implies in the processes of institutional management. An antecedent of the academic and administrative feasibility was established to ensure that students can carry out school activities in community spaces, carrying out real actions, not classroom simulations. Finally, the students of the Environmental Education subject, by putting into practice what they learned theoretically, built a broader knowledge of reality, learned that they can be agents of change if they are convinced of what they want.

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