

## As expectativas educacionais dos estudantes de Getão Ambiental no Colégio da Comunidade de Morelos, no México

### *The educational expectations of students from Tres Mariás Environmental Management Community High School in Morelos, Mexico*

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#### Resumo

Em 1997, camponeses da comunidade de Três Marias decidiram construir uma escola secundária para as crianças. Esta comunidade fica situada no Corredor Biolóxico de Chichinautzin na Serra do Norte, estado de Morelos. Esta área de conservação foi criada para proteger os processos biológicos e o desenvolvimentos da zona e para formar um cinturão verde natural o crescimento de população de Cidade do México e de Cuernavaca. A Universidade Autônoma de Morelos(UAEM in Spanish) ficou com controle do projeto e em 1999 abriu o Colegio da Comunidade de Três Marias and (TMCHS). A proposta original era criar uma escola secundária de sistema duplo, i.e. educar os estudantes na escola secundária normal com a possibilidade de ir para a universidade ou de estudar Administração Ambiental em uma escola secundária técnica. Uma entrevista formal foi feita com o coordenador acadêmico e promotor do projeto para obter informação sobre o a concepção do projeto da TMCHS. Uma pesquisa qualitativa (entrevistas em profundidade) foi usada para colecionar informação sobre as expectativas educacionais dos estudantes. Nós concluímos que o conhecimento destes estudantes foi limitado a uma identificação do ambiente que usa descrições simples de flora e fauna. Nós vimos que aos estudantes também faltou uma compreensão de outros assuntos ambientais cruciais. Além disso, este estudo indica que as características dos estudante e variáveis ambientais (atividades instrutivas e experiências de fora-de-escola) exerceram uma influência significativa sobre o sucesso e sua satisfação dos estudantes. Além disso, este estudo provê um exemplo de um modelo de avaliação que considera os efeitos de características de estudante e de suas atividades instrutivas na realização de estudante e pode ser usado efetivamente para pesquisa em outros tipos de atividades de designio instrutivas ambientais comunidade-baseadas e resultados aprendendo.

**Palavras-chave:** Escola de comunidade. Estudantes. Gestão Ambiental. Entrevistas. Corredor Biológico de Chichinautzin.

#### Abstract

In 1997, peasants from the community of Tres Marias decided to build a high school for their children. This community is located in the Chichinautzin Biological Corridor in the Sierra Norte in the state of Morelos. This conservation area was created mainly to secure the biological processes and developments of the zone and forming a natural greenbelt boundary for the population growth from Mexico City and Cuernavaca. The Autonomous University of Morelos State (UAEM in Spanish) took control of the project and in 1999 and the Tres Marias Community High School (TMCHS) opened. The original proposal was to create a dual-system high school, i.e. to educate students in the normal high school with the possibility of going on to university or of studying environmental management at a technical high school. A formal interview was conducted with the academic coordinator and promoter of the project, to obtain information about the design of the TMCHS project. Qualitative research (in-depth interviews) was used to collect information on educational the students expectations. We concluded that these students' knowledge was limited to an identification of the environment using simple descriptions of flora and fauna. We saw that students also lacked an understanding of other crucial environmental issues. Moreover, this study indicates that both student characteristics and environmental variables (instructional activities and out-of-school experiences) exert a significant influence on student achievement and satisfaction. In addition, this study provides an example of an assessment model that considers the effects of student characteristics and instructional activities on student achievement and can be used effectively for research on other types of community-based environmental instructional design activities and learning outcomes.

**Keywords:** Community school. Students. Environmental management. Interview. Chichinautzin Biological Corridor.

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## INTRODUCTION

Like many other countries worldwide, México faces an environmental crisis of enormous proportions. In rural areas, which are largely devoted to food production based on traditional methods, environmental concerns are mainly related to phenomena such as deforestation and soil erosion. The future food production in these regions and the possibility of improving the quality of life of their inhabitants depend on the peasants' understanding of these kinds of problems, and their capacity to confront them. The biological diversity of México is great (Ramamoorthy *et al.* 1993) and results from its topographic and climatic variation, which creates a rich mosaic of habitats. This diversity of environments and a wealth of natural resources were undoubtedly decisive factors in making México the birthplace of major early civilizations of Mesoamerica. Contemporary rural México is still, after many centuries of social change, an agrarian nation that is dominated by indigenous or Indian-derived peasants (Grimes, 1988). These indigenous groups live in nearly all of the main natural habitats of the country. It is important to emphasize that in México, two singular forms of community-based ownership are currently recognized: The first of these involves ejidos, where the Government granted land and water resources to a community of producers (Cord and Wodon, 2001). The second form is a "comunidad", which is a pre-existing corporate entity whose rights are recognized if its members can demonstrate prior, long-standing community-based use of the surrounding resources (Alcorn and Toledo, 1995).

Community-based systems of resource management are of great importance in México, approximately 30,000 peasant communities manage more than 100 million hectares, corresponding to 60% of the country's productive land. In addition, 7000–9000 communities manage approximately 70% of Mexican forests (Bray, 1995). Furthermore, rural communities in México are largely poor and have been marginalized from the benefits of the country's overall social development. These community-owned areas were for many years exploited by private and state companies, with no benefits to local people. Over the last two decades, however, peasant communities have been reappropriating their own resources. Today, over 500 "ejidos" and "comunidades" have come together to form the National Union of Forest Community Organizations, which is demanding economic incentives, technical assistance, and scientific information to achieve sustainable forest management (Castillo, and Toledo, 2000).

The Tres Marias community is located in the Huitzilac municipally, inside the Chichinautzin Biological Corridor in the Sierra Norte in the state of Morelos, which is in the south region of México City and southeast of the state of México (Figure 1). Huitzilac is between 19° 00'00" and 19°07'20" latitude north and between 99°10'20" and 99°20'00" longitude, and covers an area of 200.66 km<sup>2</sup>. Temperature varies between 12 and 22 C° (CEAMA, 2006). The Chichinautzin Biological Corridor (CBC; 373, 0 km<sup>2</sup>) is a natural protected area and was created in 1988 as a biological corridor to connect the Lagunas de Zempoala (47,9 km<sup>2</sup>) and El Tepozteco National Park (240,0 km<sup>2</sup>). CBC was also established to secure the biological processes and developments in the zone; and to form a natural greenbelt boundary for the population growth from México City and the city of Cuernavaca.

The confluence neartic and Neotropical floristic elements provide to the biological corridor a high biological diversity. There are about ten different kinds of vegetation: tropical deciduous forest (between 1500 to 2000m of altitude), pine forest (between 2800 to 3000 mm), oak pine forest (between 1600 to 2800mm) and some fragments of mixes of both these temperate forests. In the most rained zone there is the mountain mesophile forest, in the most dry zones there are the savanna areas, also there are alpine grasses and meadows: Regarding the fauna, there are 237 species of birds, 60 mammalian species, 1348 species of arthropods, five species of fish, seven amphibian species and 45 species of reptiles (many of these species are endangered or endemic or both, CEAMA 2006).

Currently the biological quarter is threatened by changing use of soils, the sale of land, forest fires, poaching, deforestation, and the sale of earth and volcanic rocks. Moreover, in the area of the Chichinautzin Biological Corridor, approximately 75% of lands belong to "ejidos" or "comunidades" (Aguilar, 1995)

## HISTORY OF THE TMCHS PROYECT

In 1997, peasants from Tres Marias considered it necessary to build a high school for their children; this decision counted on the active participation of residents. Initially the community requested support from Huitzilac council and other educational bodies. Finally, however, the Autonomous University of Morelos State took control of the project. In 1998, the University requested educational support from the following departments: the Biology and Agronomy Faculties and the Biological Research Institute. Thus, in 1999 the first school year of the Tres Marias Community High School commenced. The original academic project was similar to a regular high school, but in this particular case would include within the curriculum an axis of technical education, oriented towards biological, agricultural and livestock areas. The original proposal was to create a dual-system high school, i.e., to educate students in the normal high school with the possibility of continuing their studies at university or at a technical high school in environmental management (originally the curriculum had been

geared towards biotic resources, but at the time of the interview there had been some changes to the original concept and the curriculum was now geared towards environmental management).

The main objectives of creating a technical high school in environmental management was to profit by the location of the high school – in the environmental area protected by governmental decree- and linked to a restoration project in this area (Chichinautzin Biological Corridor) promoted by the Biological Research Center of Morelos University.

The indirect objectives were to foment students' awareness of the natural environment of the area, that these students help transmit environmental awareness to the community residents and that these students use the knowledge obtained in sustainable activities in the same community. Unfortunately, the history of this Institution has been marked by numerous problems (economic, political, and institutional) which have made the achievement of the original goals difficult. The main problem was that at an academic level, the high school did not obtain official validity, since, when students finish high school; they receive their certificate from the Autonomous Morelos State University and not from the Tres Marias Community High School.

The main goal of this research was to find out students' expectations concerning the school and to what extent these expectations had been met. As these expectations are subjective and differ from individual to individual, it is not easy to isolate them. It is also important to take into consideration the fact that these teenagers are experiencing physical and emotional changes and they also need to feel accepted by their group (Diaz, 1987; Merino, 1990). Also, we seek to complement and add to emerging set of critiques and attempts to improve this important community-based educational initiative in environmental management, through a particular focus on a public university as mediators of people-environment relations.

## **METHODS**

There were two kinds of interviews; first, a formal interview was conducted with the academic coordinator and promoter of the project, designed to obtain information about the history of the project, objectives and perspectives of TMCHS and to know the kind of professionals that participated in the design of the school project. Another interest of this research was to discover if the students' and the school's expectations were compatible. For this, a second interview (the guide is the appendix 1) was made to evaluate the educational expectations of the TMCHS students. The method used for these interviews was the qualitative research, which means to use the in-depth interviews to collect the desired information. This kind of methodology (qualitative) is centered on understanding social phenomena from the actors' perspectives (Taylor, and Bogdan, 1986). It refers to research which produces descriptive data, people's own words, and both written and spoken, and observable behavior. The study must look at the scenario and the people from a holistic perspective. The qualitative research interview attempts to understand the world from the subjects' points of view, to unfold the meaning of peoples' experiences, to uncover their lived world prior to scientific explanations (Kvale, 1996). The interviews were carried out with those students who were studying the last semester only in the technical area.

To carry out the appointment to execute the interview with the students, firstly we made a date with the academic director of the school to explain the objective of the research and ask for an authorization to make the interviews with the students.

The interviews were made with students of the last semester (8°) that took a technical course of environmental management. The interviews were carried out in the settlement of TMCHS with each student separately (eight students were interviewed in total).

The interviews were semi-structured, using an open-ended interview guide inviting respondents to speak in their own words and in narrative structures (Mishler, 1986), basically were divided into five main areas:

- Personal: the objective was to profile the student's family background
- Education: the objective was to find out the reasons why students wanted to study in the school and what knowledge they had about academic aspects of the school such as objectives, curriculum and acquired knowledge.
- Labor: the objective was to explore students' perceptions about which type of job they would find and the links established between job and profession.
- Social: the objective was to study the relationship students have with each other and with the community as well as the perception students have of their community.
- Environment: the objective was to analyze students' attitudes towards the environment, their knowledge, perceptions and appraisal of environmental problems in the community, how these problems manifest themselves, and what expectations students have regarding participation in their own education and shaping the environment in the future.

We should also take into account that during the interview the interviewee may express what they really think but the possibility always exists that they may not say what they really think; they may omit information or give ambiguous answers for example. From an interpretative perspective, these aspects do not invalidate the interview, inasmuch as this kind of analysis does not attempt to reach an absolute truth, but it is based on what the individual says and what is significant for them (Taylor, and Bogdan, 1986).

To assure the validity and reliability of some students' responses we used the phenomenological analysis (Giorgi, 1975), that appeared relevant for clarifying the mode of understanding experience meanings of the subject's life world. To validate some objective responses (about curriculum, school objectives, field activities, etc) we related student's responses with the school curriculum with coordinator project responses.

## RESULTS AND DISCUSSION

In the interview with academic coordinator, she said that the main idea of the project was to train the students to work as environmental managers; i.e. "to understand the environmental legislation, to design projects and to sell them"<sup>1</sup>. In technical education, the courses were: environmental education, ecology, biodiversity, agronomy, agro-ecology, forest management, biotic resources and environmental impacts. Through observation the curricula of TMCHS could be concluded that no courses were offered on environmental legislation, statistics, resource management or environmental project design, which could be considered necessary for training an environmental manager according to academic coordinator and in agreement with from the Blas Pascal University of Argentina (Meyer, 1994) and from the Interdisciplinary Laboratory of Environmental Management of the Federal University of Rio de Janeiro, Brazil, which also run a bachelor's degree in environmental management (Macedo, 2000).

## STUDENTS' PROFILE

Most of students were female (62.5%) and their ages varied between 16 and 22 years old; half was be able considered regular students, i.e. those who had a regular trajectory as a student, and the other half were behind in their studies. All of the students lived at home with their parents and were single coming from large families. In general, their parents had a low level of education and less scholarship than their sons (75% studied less than 9 years). Every student came from a state school located in their community.

They all considered that their relationship with other students and their teachers were good (which means there were not regularly disagreement among each other and they share many things and topics). The social need to be accepted is of great importance during adolescence and dominates their development throughout this stage (Sanchez, 1979). It is at this time that an individual begins to spend less time with their family and more time with their peers. Satisfaction with these peer relationships is important to the development of high self-esteem. Adolescents are more likely to have higher levels of self-esteem and academic achievement if they are accepted by their peers (Parker, and Asher, 1987).

Around 37.5% of students have some sort of paid work, 37.5% did not work, while 25% work but do not receive payment. These last students were all female and their work was seen in terms of supporting their families. Besides, in rural areas it is very common for children to carry out unpaid work within the family. In our case, both students were female and their work was seen as merely helping out, even though it demanded more of them as it also involved affective aspects. The cause of this situation is the traditional division of labor between the sexes found in Latin America. Under this division of labor, women are responsible for the private or reproductive sphere, closely associated with domestic work and caring, for which they receive no economic reward (FAO, 1991). Possibly that is the main reason why most of students in the TMSHS are female and the possibility of having a profession is very encouraging for these rural women, because they can change their status in the community.

## THE SOCIAL, EDUCATIONAL AND ENVIRONMENTAL EXPECTATIONS OF STUDENTS.

According to Westen (2002) "expectancies are expectations relevant to desired final results. Behavior-outcome expectancy is a belief that a certain behavior will lead to a particular outcome. Self-efficacy expectancies are people's beliefs about their ability to perform actions necessary to produce a desired outcome". There are individual differences regarding cognitive and emotional dispositions involving degrees of hope. Higher levels of hope lead to greater perceptions of agency and pathways as people consider their goals. When compared with the specific area of college academic achievement, the results suggest that success in achievement appears to be related to higher hope (Snyder, *et al.* 1991)

The reasons why each student chose this kind of school were varied as were their relationships with their families and community, and the economic opportunities open to them. Some of the reasons given for choosing this school were:

”a preference for studying in the Autonomous University of Morelos State”, “proximity to their home”, “lower travel expenses”, “the kind of teaching offered”, “academic achievement” “to get a better job and a better way of life than at the moment” and “the opportunity to have a profession”.

Regarding students’ knowledge of the aims of the school, certain confusion could be noted. Some believed that the aim of going to school was to get a better and more stable job while others saw the aim of the school as giving people knowledge, and only one person referred to the aim of consciousness raising about the environment and the community tying in with academic coordinator’s statement that the school aims to “create environmental consciousness in the students”.

All students claimed to be satisfied concerning the level of knowledge they had acquired but nobody had a clear idea about what made an environmental manager in practice. Concerning expectancies in the environmental area, the students displayed good theoretical environmental knowledge related to the school curriculum. They also displayed an understanding of environmental concepts and used technical language to express these concepts. They were aware of the biological diversity of their community and the set of problems that they had to confront. The students showed that they possessed the ability to define what an environmental problem was. However, they did not display knowledge concerning what an environmental manager does in practice, referring more to biology teachers. Another area where students lacked information was their vocational orientation. After receiving their high school diploma, all students in the TMCHS had to continue their studies by studying biology or a similar subject. According to the EIA (Environmental Impact Assessment), the concept of environment involves: inhabitants, fauna and flora, land, water, air, climate, archaeological heritage, public access to natural environment, human health, living conditions and general well-being (Canadian International Development Agency, 2001). The students believed in a conceptual similarity between biology and environmental studies, so we may conclude that their knowledge, judgment and intervention in favor of the environment are limited to an identification of the environment by the mere description of flora and fauna. Problems such as the effects of population growth, limited resources, increasing pollution, legislation, the influence of social stability in the community and their quality of life, among others, were not discussed in the classroom. The main problem in this case was that the curriculum of the TMCHS was designed only by biologists and psychologists, and it was based toward these areas. In synthesis, students displayed a serious lack of understanding regarding environmental issues. At the same time, the notion of environmental sustainability is problematic given the diverse, partial perspectives of different social actors: what is to be sustained, and for whom? This is not to argue that there is no place for consideration of overall resource availability, and for management processes, which aim at increasing it.

Moreover, students were not included in environmental projects, not even in the restoration project of the Chichinautzin Biological Corridor, which was carried out by the Autonomous University of Morelos State. We were also able to recognize that the number of field activities was insufficient; regarding both content and number of students per semester and per course (all students agreed that the field classes were scarce). This aspect is very important because a great difference exists between participating and observing. Russell (1912) has concluded that we can only understand a proposition if it consists of elements with which we have become acquainted. In the case of TMCHS, we think the school project failed because it did not take advantage of the opportunity offered by its surroundings (the school being located within the biological reserve) and it did not confront the students with the day-to-day problems in their community.

Finally, we asked about the expectancies of the environmental knowledge acquired and what their proposals were for an improved environment in their community (Table 1). The expectancies were confused, taking into account professional and personal wishes and economic demands. The students’ expectancies were influenced by school dynamics, the knowledge that they had acquired teachers’ thoughts and their experiences and needs. This difference accounts for a major problem presenting itself wherever environmental issues are discussed. Considering cognitive-motivational characteristics, several factors appear to be related to student achievement. For instance, academic self-esteem and achievement expectancies are significantly correlated with course performance and school dropout rates. Similarly, several types of student goals and parental influences are related to student success. These results indicate that an assessment of the effects of student characteristics on instructional outcomes should simultaneously consider both prior achievement and cognitive-motivational variables.

The results of this study indicate that both student characteristics and environmental variables (instructional activities and out-of-school experiences) exert significant influence on student achievement and satisfaction. In addition, this study provides an example of an assessment model that considers the effects of student characteristics and instructional activities on student achievement and can be used effectively for research on other types of environmental instructional design activities and learning outcomes.

## **SUGGESTIONS AND PROPOSALS**

Besides, the consensus in the wake of the United Nations Conference on Environment and Development suggests that the implementation of what has come to be known as “sustainable development” should be based on local-level solutions

derived from community initiatives (Ghai, and Vivian, 1992; Ghai, 1994), we were not able to find published papers that describe other similar experiences about communitarian high schools in environmental management studies, that could offer some models to TMCHS project. Possibly these programs tend to occur in remote locations, inhibiting outside access to direct information on program needs and achievements. Moreover, the practical implementation of community-based in natural resource management initiatives has frequently fallen short of expectations. A number of reasons have been identified, including a tendency (despite rhetoric to the contrary) for the beneficiaries to be treated as passive recipients of project activities (Pimbert, and Pretty, 1995), a tendency for projects to be too short-term in nature and over reliant on expatriate expertise; and a lack of clear criteria by which to judge sustainability or success in meeting conservation or development goals (Western *et al.* 1994).

The TMCHS should be re-discussed with more clarity regarding the aims and objectives, methods, and philosophy of the school instead of only fitting in with the socio-economic conditions of the Autonomous University of Morelos State. The students need to know the real perspectives their education offers them. The objectives that the school should be working towards in technical areas are to:

- develop in the students the ability to identify the main environmental (not only biological) problems of the community,
- develop environment sensibility and consciousness in the students,
- educate promoters who will have a multiplier effect of environmental knowledge in the community,
- develop environment management professionals who will be able to work on environmental issues.

Regarding the curriculum, it is necessary to add courses more closely related to environmental management. It is also essential to increase the amount of practical training students receive because participation is different to observation. Partnerships could be established with other universities, companies and NGOs to increase the amount of practical training which already exists in other technical preparation schools in Mexico (CONALEPS),<sup>3</sup> where the students confront real problems.

It is important to be able to consult promoters and trainers working with community farmers in order to understand the community's real perspective. Students should be incorporated into the Chichinautzin Biological Corridor project and the community should be informed about the important role of this kind of school in their lives and future.

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## **Appendix 1**

Interview guide to in-depth interviews with the TMCHS students

### Personal area

Student's name

Age

Civil state

Address

Who do you live with?

Father school level

Mother school level

### School Area

Which were the reasons why you decided to get into the community school of Tres Mariás?

How did you decide to get into that school?

Did you have enough information about the school when you decided to get there?

Do you count with your family about this topic?

*Institution knowledge.*

Do you know the objectives of the school?

Do you know what an environment manager is?

Can you talk about the expectations that you had at the beginning of the school course, and now, when you are finishing, did that expectations change?

### Social Relation Area

How do you describe your relationship with your classmates?

Do you talk to them; do you have enough confidence with them?

Do you share the same things and topics?

How is your relation with your teachers?

### Out of school Area

Do you have a job?

Where do you work at?

What kind of job do you have?

Do you earn something?

Do you have another kind of activity out of school?

### Community Relationship Area

How do you feel in the community?

How do you describe the community, how is it organized?

Is the community establishing conflicts between the inhabitants?

How are the family relations like inside the community?

### Environment knowledge Area

Can you describe the natural surroundings of your community?

Can you tell us in your own words what an environmental problem is?

Which are the main environmental problems that you identify in the community?

Do you participate in the management and conservation of natural resources activities?

Which are the expectations and environmental proposals you can offer, with the knowledge that you have right now?

Table 1



**Table:** Students responses

Students Ranked	Responses
1	Conserve the Chichinautzin Biological Corridor. Work in the community and council to buy a water pump.
2	Obtain more knowledge to raise people's consciousness Design projects.
3	Wait to have more knowledge. Give conferences to Tres Marias residents.
4	Have a profession, a house and a family.
5	I still have limited knowledge, no specific type of work.
6	I do not understand that well. Helping to reforest.
7	To be a biologist. Help to reduce the amount of trees cut down.
8	Do not have any expectancy. It depends if the people contribute.

## Notas

<sup>1</sup> Academic Coordinator own words

<sup>3</sup> Colegio Nacional de Educación Profesional Técnica (CONALEP), is geared towards the education of technical professionals above high school level. The objective is to give technical professional education at post-high school level according to the requirements and necessities of the productive sector, as well as offering technical services to the diverse economic activities of the country. A total of 206 establishments exist distributed all over Mexico. <http://www.conalep.edu.mx/web2/>

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