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INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTS) AS A TOOL FOR INTERCULTURAL EDUCATION

*A collaborative experience in secondary education in Tlapa de Comonfort,
Guerrero, Mexico*

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Abstract. This paper discusses the collaborative experience of creating educational materials for a secondary school in Tlapa de Comonfort, Guerrero, México. In this school, students from Nahuatl, Tun savi, Me'phaa and Spanish speaking communities live and learn together. The intercultural context provides challenges for science education that we sought to address. The use of collaborative technologies in science classes has made visible the cultural diversity in the classroom, helping students and teachers recognize themselves as active agents in the construction of common knowledge and in sharing their knowledge. This experience also shows the importance of ICTs as technologies of expression that reinforce individual and collective identity in intercultural contexts.

1. Introduction

The city of Tlapa de Comonfort, Guerrero is the point of contact of indigenous communities in the region of La Montaña. In this city members from Nahuatl, Tun Saavi, Me'phaa and Spanish speaking communities live together. This work was conducted in a secondary school that reflects the cultural diversity of Tlapa.

In that school, as elsewhere in Mexico, educational policies follow strong trends towards the imposition of hegemonic visions that make invisible the cultural diversity. This situation and other factors related to social and economic inequality experienced by indigenous communities, results in low levels of educational achievement that lead to the loss of a large number of indigenous students in the educational system, (INEE, 2009).

Intercultural education is proposed as an alternative to achieve objectives related to the valuation of knowledge and practices of different cultural groups. In recent years, the Mexican educational system, in order to change this situation, has promoted several initiatives and programs focused on intercultural education for the recognition, respect and promotion of cultural diversity (Shmelckes, 2003).

In practice, intercultural education requires strategies for developing communication skills that promote recognition of cultural diversity and coexistence based on dialogue, and among these strategies, the use of ICTs has been recently incorporated.

According to the strategy proposed in our experience, ICTs in intercultural education offer a new dimension to make available to both teachers and students tools that contribute to the access, distribution, appropriation and application of knowledge as well as the competences to share it with a large number of individuals.

This paper presents an overview of intercultural education in Mexico and its insertion to reduce the problems of exclusion of indigenous students in secondary basic education. We show the models and principles for use and appropriation of technologies in learning communities as part of strategies to achieve the objectives of intercultural education through the collaborative production of educational materials. Finally, a brief description of the experience and its main results point to some reflections on new experiences in using ICTs in the recognition of cultural diversity, promotion of dialogue, and assessment of the richness of the intercultural coexistence.

2. Intercultural Education in the Mexican Educational System

In Mexico, the discussion of intercultural education is closely related to the role that has been given to the various indigenous peoples in the formation of a national project. During the twentieth century, the Mexican education system had a policy based on the assimilation of indigenous peoples through the promotion of Spanish language literacy, imposing perspectives beyond the preferences and intentions of indigenous peoples that result in two parallel subsystems: on one hand, education directed to the indigenous students, whose organization often isolates the members of indigenous communities and on the other hand, the education of "not indigenous" population, that does not recognize the cultural diversity, and in many cases holds a position that identifies national unity

with cultural homogeneity, where social diversity is an obstacle (Ramírez, 2006; Tello, 1997).

The recognition of Mexico as a multicultural and multilingual country was included in Article 4 of the Mexican Constitution in 1992, marking the beginning of major changes in education. In 2001 the Constitution also included the need for intercultural education for the entire Mexican population, referring to both indigenous and minority migrants from different countries (Shmelkes, 2003).

The Reform of Secondary Education (2006) notes that intercultural education is essential for building knowledge and skills, values and attitudes towards the recognition of cultural diversity, based on the critical analysis of the characteristics of the community and its relation with the regional, state, national and international context. Thus, it is expected that secondary education contributes to the making of competent members of intercultural communities: "The student recognizes and values different cultural practices and processes. The student participates to the respectful coexistence and assumes interculturality as a dialogue to live together in social diversity, ethnic, cultural and linguistic diversity" (SEP, 2006).

All the syllabi of basic secondary education include some issues related to intercultural education. However, in everyday teaching practice, the intercultural approach fails to reach the objectives due to the lack of educational resources. For example, some textbooks inserted in a superficial way the discussion on cultural diversity, showing traditional knowledge as a non-valuable knowledge, often providing an unfavorably comparison with Western culture (Castillo, 2010; García and Lazos, 2012).

In many textbooks issues related to intercultural education are often isolated from their context, and there is no connection between intercultural issues in the same course, lacking of the minimal integration that is intended in the plans and curricula for skills development, and without reflections to appreciate science as a product of cultural interaction.

This gap between the approaches of the programs and the effective implementation of an intercultural approach in secondary education results on several facts:

- 1) lack of recognition of cultural diversity in the school context,
- 2) lack of materials and resources for use in specific contexts in secondary schools and
- 3) deficiency in teacher training to comprehensively address issues of cultural diversity

Clearly, the transformation of the current status of basic secondary education requires new perspectives to identified problems, and in this context, ICTs appear as a viable option.

The theoretical background for the use of ICTs as tools for intercultural science education is based in a pluralistic perspective of knowledge, as well as the principles of social justice for intercultural dialogue to promote the conversion of the plurality of cognitive resources into real opportunities for social change (Villoro, 2009).

This theoretical approach is suitable for the study of Mexican society where coexistence between different cultures is marked by extreme inequality. Under these conditions, the pursuit of social justice is closely linked to the recognition of cultural

diversity and the need of pluralistic dialogue (Villoro, 2009; Dos Santos, 2007). In this perspective, education's main purpose is the development of citizenship skills to promote the recognition, reflection and appropriation of different forms of knowledge (Olive, 2007).

3. Intercultural Education and the Use of ICTs

Information and communication technologies (ICTs) offer new possibilities for content development and educational activities. Its application allows the design of new teaching methodologies, teaching and learning materials as well as multimedia resources that can provide interesting developments in education.

From a moderate perspective, ICT mean a group of informational sources for students and tools to analyze and communicate their learning products. In this perspective, ICT is of great importance as a resource to promote active learning.

In this work, ICTs are considered not only as communication resources or tools to solve problems, but also as cognitive elements that transform the relations of creation and exchange of knowledge. From this perspective, the role of ICTs is not limited to providing information management tools, but it offers models of cognitive agency, focused on the collaborative production and exchange of knowledge that are directly associated with the formation of learning communities (Lessing, 2004).

This perspective of ICTs can meet the requirements of an education system that go beyond simple cultural exchange of knowledge, requiring also the training of students as active agents in the assessment, generation and communication of knowledge that occurs in specific contexts.

A model of intercultural education involving local actors in the production, communication sharing educational content of each community, requires a methodology for the collaborative production and open for any such content (Valladares, 2010; Feltrero, 2009).

The example of knowledge-producing communities in the network is being used as a model for understanding self-organizing communities leading to produce information and knowledge (Feltrero, 2009). The basic principles shared by almost all successful communities of knowledge production in the network, such as the famous Wikipedia, can be enumerated as follows:

- The mediation of technology tools for knowledge production and sharing through the Internet.
- The open-ended principle which states that everyone can participate in the process of knowledge production and allowing diverse groups with diverse abilities, each to the extent practicable, motivations and interests, to contribute in the collaborative production process.
- The sense of community shared by all those who contribute to this process of creation and the members who make voluntary contributions in order to search for a common purpose, socially sound and valid.

In the field of intercultural education, the need to develop a large number of new educational materials, each adjusted to the cultural context, justifies the need for

collaboration and participation of all stakeholders in the process, in which include teachers and learners through the necessary review provided by both educational specialists and qualified representatives of each cultural community.

This model has been the basis for intercultural education strategy applied to the production of educational materials in the intercultural context of secondary education in Tlapa, Guerrero.

4. The Work at Tlapa de Comonfort, Guerrero

La Montaña, Guerrero is a region of southern Mexico where communities Nahuatl, Tun Saavi, Me'phaa and Spanish-speaking groups live.

Many communities have intercultural bilingual primary schools, but in secondary education level, students attend general and technical schools outside their places of origin, where they meet members of other communities. The experience presented here was conducted in a secondary school in the city of Tlapa de Comonfort, the largest city in the region of La Montaña in the state of Guerrero (Figure 1).

This school, located in the marginal zone of Tlapa, is the main option for young people to pursue their studies between the ages of 11 and 17 years. Many are people from various communities in the region. In this school, 55% of students speak a native language of the region. It is noteworthy that some of these students also speak Spanish and even two or three Indian languages, depending on the community of origin, while others are monolingual, with minimal competences in Spanish.

The school operates with a minimum of material and human resources, with 15 teachers to serve 500 students, covering the 7-hour school day. It is worth mentioning that all teachers are Spanish speakers, with very little knowledge of other languages (Figure 2).

This experience was conducted as part of the research project "Alternatives for Science Education in Intercultural Contexts" funded by the National Council of Science and Technology of Mexico. This research has been developed on several states of Mexico, both urban and rural secondary schools. The main objective of the project is the study of factors involved in the intercultural education, focus in science teaching, to identify some problems and propose strategies for attempt to resolve them.

The initial work of the project had identified that, despite the characteristics of the secondary school at Tlapa, cultural diversity was an issue virtually invisible, or only perceived as a cause of low achievement levels among students. Although in daily contact there is an evident linguistic diversity, the trend in education has been to minimize the use of indigenous languages, especially in the case of science courses.

Students express their motivation to attend school to learn what is necessary to be incorporated as soon as possible to work, and very few students expect to continue their studies in high school. More importantly, for many students attending school only serves to achieve a sufficient level of Spanish to work as a mason, a house maid or just to be able to migrate to other regions, so their minimal interest in other subjects of secondary education, as science courses, is noticeable (García & Lazos, 2012).

The textbooks and other educative resources are only available in Spanish, and often focus on the urban reality of central Mexico, unrelated to the state and regional context of Guerrero.

Given the characteristics of context it seemed to apply a series of educational interventions based on the model of ICT-mediated collaborative work addressing issues of science from an intercultural perspective.

The work aimed to explore the knowledge about their environment that the students use in their every day life, and beyond that, to establish a dialogue between different types of knowledge, including scientific and technological knowledge (Figure 2).

The contents were initially referred to the structure of plants, maize cultivation and the use of terraces for cultivation in mountainous areas. However, when working with students and teachers, it was necessary to broaden the discussion including content related to everyday life in the communities and the interests of the students.

The model of collaborative creation was implemented as far as possible. It was considered that the most important contribution would come from teachers, however, the response of students exceeded our expectations. After working on the recognition and appreciation of cultural diversity, the students wanted to produce materials in their native languages. The students produced and shared materials in video, text, or audio. Some materials were translated to several languages in the collaborative process.

The video has been one of the most used tools, because it is very appealing and easy to handle, with the possibility of incorporating two learning strategies that are very close to students: observation and narration. In addition, when students are faced with the task of planning a video for their peers to learn a given subject, it is necessary to establish action plans and decision making, which require the development of their attitudes to collaboration and dialogue (Figures 3).

Issues related to cultivation have been successful in motivating students to recognize themselves as knowers and show their own knowledge. Through video, students have found the ability to display one of its facets less recognized in the classroom: their role as peasants, which has contributed to the recognition of this activity in the school context (Figure 4).

In the videos, students show their knowledge of the natural environment that in many cases has been obtained by their early incorporation into the work arena. The local knowledge takes on new meanings when compared to scientific knowledge, establishing a dialogue between the school vision and the everyday reality. It is common in discussions that students involve some local knowledge while explaining a scientific construct (Figure 5).

Collaboratively produced materials also serve as a basis for reflection on the different ways of learning. For example, during the screening of one of the videos, several students made comments and questions about the possibility of introducing new plants in other environments, leading the discussion to questions about how they had learned and how we could test, confronting traditional practices with an experimental design.

One aspect to be emphasized is how the collaborative production of the video for science courses has been a valuable tool for the recognition of linguistic diversity and the use of different languages in education (Figure 6). From the moment of planning the

video, students have considered the importance of assigning the role of translator or interpreter between the participants, to include the participation of speakers of different languages outside school such as the elderly communities or people with no schooling. Furthermore, this effect has extended the possibility of parallel exhibition of materials produced for other audiences, using the linguistic possibilities of the members of the context, since many of the materials incorporate at least two languages other than Spanish.

So far, the materials show the potential of this model to produce materials tailored to intercultural contexts and represent an important exercise for the appropriation of knowledge.

One of the most important results has been the establishment of a new way of working, which allows students to be recognized as active agents in the learning process, as bearers of valuable local knowledge, and as members of a community where knowledge is socially generated and shared. It should be noted that the collaborative work opened opportunities to establish links and commitments among the participants. The work inside a learning community was a new experience for many students and teachers at school. The experience shows how open participation according to the various capabilities brings many possibilities for dialogue and intercultural interaction, making visible the cultural and linguistic diversity in the classroom (Figure 7).

While this paper has emphasized the resulting video, it is important to note that the experience has included the use of several technologies; to drawing, using text and audio so that the participants have the resources needed to continue independently with the collaborative creation and dissemination of materials via the Internet (See Appendix Figure 8).

The next step is to extend this experience to other communities and research groups, sharing materials via the Internet, in an open space on web for the collaborative creation and exchange of resources for intercultural education.

This web site has the objective to share and promote diverse resources based on content selected and developed by the communities themselves, making a contribution to solving the problems of lack of educational materials in Mexican indigenous languages and their failure to adjust to the cultural context where employed.

One point to be solved is the limited access to many online communities and tools for the production of materials, making it necessary to establish criteria for selecting appropriate technologies and free alternatives. Likewise, it is important to keep in mind that the continuity of such interventions depends largely on the possibility of providing people of technological possibilities for exchange, dissemination and creation of culturally appropriate content.

5. Conclusions

The experiment conducted in a secondary school in Tlapa shows how even under limited economic resources, it is possible to establish models that transform the relations of learning and allow recognition of cultural diversity.

The collaborative production model has been successful in engaging students as active members of a learning community and in recognizing the technological and

social possibilities of promoting linguistic diversity in the classroom. In addition, the model enabled participants to recognize themselves as active agents in the collaborative production of educational materials appropriate to their socio-cultural context and expectations.

This experience shows the need to use ICTs not only as a tool of information management, but as a technology for individual and collective expression central to intercultural dialogue.

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Appendix



Figure 1. The State of Guerrero is located in Southern Mexico.



Figure 2. Overview of Secondary School at Tlapa de Comonfort, Guerrero (Photo by: Angel Osorio).



Figure 3. The first step for making a video: Writing a sound story about science (Photo by: Jesus Susano)



Figure 4. The participants of the workshop on science and video analyzing their first works. (Photo by: Jesus Susano)



Figure 5. The students carried on themselves all the steps of video production. Here, a camera girl. (Photo by: Ricardo García)



Figure 6. The students used their creativity for making the video taking some materials on hand at the school. (Photo by: Jesus Susano)



Figure 7. The edition was made by working at computers that were provided by the research team. (Photo by: Jesus Susano)



Figure 8. «The Universe» was one of the themes for making a video. (Photo by: Ricardo García)