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WHO AM I? BUILDING A SENSE OF PRIDE AND BELONGING IN A COLLABORATIVE NETWORK

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Abstract. The *Conéctate al Conocimiento* project in Panamá has among its aims to establish a community of students and teachers that covers all public schools in the country. With this in mind, a network of schools has been implemented that supports and fosters collaboration, publishing and sharing, and that provides each participant with his/her own space and identity. During their training workshops, teachers started preparing concept maps on the focus question "Who am I?" and publishing them on the project's servers (as Web pages). This lead to creating "Who am I?" Cmaps of the schools, which have become the schools' 'portals' and to student's creating their own "Who am I?" Cmaps. In this paper we report how this effort has become a source of pride and belonging, resulting in a huge number of linked concept maps that encompass schools, students, teachers and school projects, and which allow users to navigate through the entire *Conéctate* project.

1 Introduction

As part of the *Conéctate al Conocimiento* project (Connect to Knowledge; Tarté, 2006) in Panamá, hundreds of schools are being introduced to meaningful learning and concept mapping through the use of technology in a collaborative network. The project is clear in its objective of transforming the way learning takes place in the classroom, moving away from a traditional rote-learning setting towards a constructivist environment emphasizing collaboration and project based learning. To achieve this goal, classroom teachers participate in two-week long full-time workshops. It is clear that transforming the environment in the classroom is not an easy task, and therefore making sure the teachers return to their classroom with a high degree of motivation improves the chances that the transformation will take place. Asking teachers to build a concept map about themselves and about their school has resulted in a high level of pride and a sense of belonging to the project. In this paper we begin presenting a summary of the *Conéctate* project, and later introduce the "Who Am I?" maps and explain how it resulted in a huge mesh of linked maps involving thousands of teachers and students throughout the country, as summarized in Figure 1.

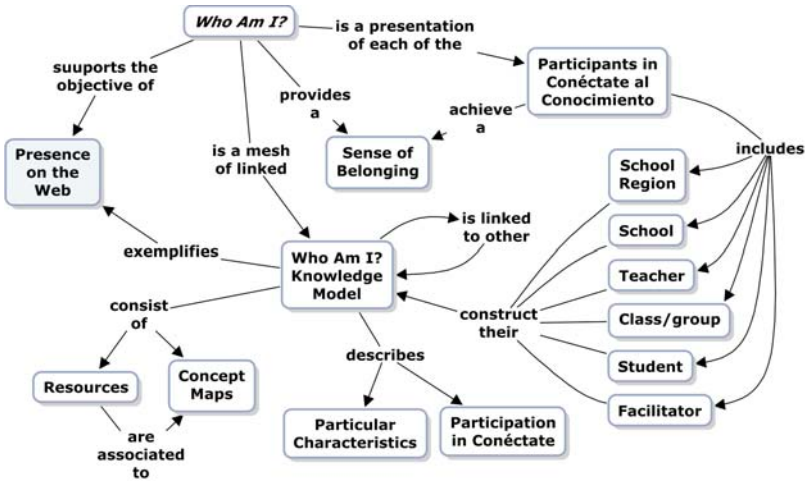

Figure 1. Through the "Who Am I" concept maps, teachers in the *Conéctate al Conocimiento* project achieve a sense of pride and belonging.

2 Background Information: Proyecto Conéctate al Conocimiento

In 2004, under the leadership of the then recently elected President Martín Torrijos, Panama adopted a national strategy based on meaningful learning for the public elementary school system through *Conéctate al Conocimiento*. The objective was to create a computer network that interconnects the schools creating, with the aid of technology, a space that allows the construction, sharing, and publishing of knowledge, the development

of new learning skills individually and in groups, and the preparation of the national capacity for the country's development as a knowledge-based society. This implies aiding in the transformation of elementary public education, from a traditional rote-learning system to one emphasizing knowledge construction and the development of skills according to the needs of the 21st century. The project's goal is to include teachers and students from 1000 schools from all regions of the country over a 5-year period, with particular emphasis on reaching remote, rural schools. At the heart of the *Conéctate* project is the implementation of a concept map-centered learning environment in the classroom (Cañas & Novak, 2005; Novak & Cañas, 2004, 2006).

2.1 An Interconnected Community of Schools Facilitating Publishing, Sharing, and Collaboration

Conéctate was designed to be a network of schools that facilitates collaboration, publishing, and sharing. To achieve this goal, the whole set of participating schools is seen as being part of the same community, as a single organization, with all schools interconnected and connected to the Internet. Within each school, a CmapServer (Cañas, Hill, Granados, Pérez, & Pérez, 2003) is installed in a LAN with a public IP address, which means that every school's server can be reached from other schools and from anywhere on the Internet. This allows the school to have a 'presence' on the Web, not only access to it. *Conéctate* emphasizes students as knowledge builders, and facilitates and encourages students and teachers publishing their work on the Web, not limiting their use of the Internet to information consumption through copying and pasting. Students and teachers publish, share and collaborate, and students can access their concept maps and resources from home or an Internet Cafe (CmapServers and resources in the *Conéctate* schools can be reached through the Places View in CmapTools (Cañas et al., 2004) or through a Web browser). Within the CmapServer, each student and teacher has his/her own area for files, concept maps, and resources. The project is also deploying *Nicho* (Lott et al., 2008), a software tool designed at IHMC that simplifies assigning each student and teacher a project-wide unique userid and automatically sets things up so it is as an email address managed by Google, for a chat service, for CmapTools, and for Web browsing; additionally Nicho provides each student their own personal space in the school's file server. Through Nicho, students can use any of the computers in the school to access their resources and personally tailored environment. The userid and personal 'space' is valid for as many years the students stay in the school system, and their 'space' with its resources migrates with them if they switch schools. The goal is for the technology to fully support and facilitate the sharing and collaborating environment needed to implement a concept map-centered learning environment.

Even though Panama is a small country, rural villages are often very hard to reach, requiring many hours of travel over bad or nonexistent roads. In many cases, the schools to be included in the project did not have electricity, or the electricity distribution was such that using computers in the school would leave the rest of the village without electricity. As a result, there are schools in *Conéctate* with electricity from a local power plant, a satellite connection to the Internet, yet they are fully part of the school network and have presence on the Web.

2.2 Teacher Training

Given the physical infrastructure of schools and the scale of the project, it was determined when *Conéctate* started in 2004 that it would be impossible to install computers (i.e., desktops) in each of the classrooms, and so they have been installed in a special room that is referred to as the *Innovation Classroom*. The advent of lower cost laptops, however, has allowed *Conéctate* teachers and students to recently begin using laptops that can be taken to the classroom providing a more flexible usage of the technology. Our experience has taught us that in most technology-in-education projects that have a computer lab, what takes place in the lab is usually not reflected in what takes place in the classroom. That is, training teachers on how to use new technologies, particularly if the computers are not in the classroom, does not achieve changing the way learning takes place in the classroom. In other words, training teachers on how to construct concept maps using CmapTools would not lead to the concept map-centered learning environment where the diverse activities that occur in the classroom take advantage of concept mapping. It was therefore determined that, to the extent possible, all classroom teachers involved in the project would participate in an initial workshop that would encompass methodologies to implement a meaningful learning (Ausubel, 1968) environment in the classroom, based on concept mapping, project-based learning and collaborative projects within the classroom, in addition to the use of new technologies.

The teacher training workshops consist of 2 weeks of full time, intensive work. Training is also provided to the school principal (a principal that supports and understands the project is one of the key factors needed for success) and Ministry of Education supervisors. Approximately 47% of the teachers have never used a computer before attending the workshop, and many have never used a keyboard (Miller, Cañas, & Novak, 2006). The decision was made, however, to have the teachers learn to use the computer through CmapTools as opposed to

using Windows and/or Office as is often done. Within a few minutes, teachers are constructing their own concept maps, maybe with some difficulty in manipulating the mouse, but are engaged in representing their understanding of some topic, an effort that they can immediately identify with, and that they perceive will be useful for their students. Suárez & Villareal-Bermúdez (2006) report that after a few days into the workshop, there is no distinction in the quality of the concept maps constructed by teachers who had or had not used a computer previously.[1] That is, the use of the computer has become, to a certain extent, transparent. The workshops aim to be completely constructivist in nature. Given that most teachers will not have computers in their classrooms, it is important that they feel comfortable with the idea of working with concept maps, both with and without computers. Overall, the objective of the workshop is to provide a basic understanding of constructivist environments, meaningful learning, concept mapping, and proper use of the technology so that teachers can take advantage in a constructivist way of any resource that they have available, whether it is technology-based (e.g., software, sensors, etc.) or not.

2.3 Conéctate's Status

Conéctate now encompasses more than 700 schools with computers and Internet connection, with over 5,000 fourth-, fifth-, and sixth-grade teachers trained in the 2-week workshops, reaching approximately 100,000 students.

3 Who Am I?

Conéctate was designed to facilitate and promote collaboration and sharing among students and teachers from participating schools. Going from a rote-learning setting to collaborating using concept maps in a meaningful learning environment is a long leap for many teachers, who, as was stated earlier, had never used a computer and/or had never browsed through the Web. An important aspect that the project pursues is providing a sense of belonging: that teachers –and schools– are not alone, that they are part of a larger community, and we believe that technology can be instrumental in achieving it.

Among the activities that take place during the teacher training workshop, there is one in particular that demonstrates how different components of the project fit together, and how the activities during the workshop continue when the teachers return to their schools. During a workshop in August 2006, teachers were asked to construct a concept map about themselves as a means to introduce them to concept mapping through a familiar topic, and were given the focus question "Who Am I?" We were aware of the use of "Who Am I?" concept maps in the WWMaps collaborative project (Tifi & Lombardi, 2006) in which schools from *Conéctate* had been involved. The concept map was extremely popular with the teachers, who really enjoyed working on the Cmap. As a result, the "Who Am I?" concept map was introduced as a standard activity during the workshop. Teachers began to bring pictures (family pictures, for example) that they wished to scan and link to the map, or borrow a digital camera to take pictures of their school and family when they return home for the weekend in between the two weeks of training. We began to notice that when they returned to their communities, teachers would "Google" themselves – that is, search for themselves on the Web. (When a concept map created with CmapTools is saved to CmapServer, a Web page is automatically generated which preserves any links to images or other resources. CmapServers that are part of the CmapTools network are automatically crawled by Google, and so the teachers' "Who Am I?" are searchable on Google soon after the workshop.) For teachers who had never previously used the Web to go back to their community and show colleagues, students, family and friends that they were *on* the Web gave them a sense of pride and belonging to *Conéctate* that surprised us. Figure 2 is an example of a concept map made by a teacher during the workshop.

3.1 The School's "Who Am I?" Concept Map

Further along during the series of workshops, teachers from the same school together with their Principal began to prepare a "Who Am I?" concept map for their school, a collaborative effort that involved constructing maps that uniquely describe the characteristics of their own school, the region in which it is located, and what distinguish them from other schools. The resulting concept maps are interesting, as teachers get quite personal in both their own concept maps and their school's map, particularly when trying to describe what is important to them in their school (e.g., a remote rural school emphasizes that it has a boat with a motor, another emphasizes that children receive free lunch, and yet another may list the names of the employees that clean the school). The

[1] Miller (2008) reports that by the end of the workshop teachers with previous computer experience do construct better maps, but there are other parameters involved, such as age (teachers with previous experience tend to be younger).

teacher's concept maps are then linked to the school's map, and when they are saved on the school's CmapServer, together they become the 'Web page' or 'portal' for the school. The school's map is then linked to a geographical map of Panama.

When they return from the workshop, their school has a 'presence' on the Web. They now have "Webpages" that they constructed by themselves, and more importantly, that they can modify at any time without the need of any webmaster or technician. This is a source of pride. Since each school has a CmapServer, their "Who Am I?" maps are housed at their school's server, not at a central server.

Figure 3 shows a Web browser with three windows.[2] The top left window is the main concept map for *Conéctate*, its Web page (www.conectate.edu.pa). This map has a link to a geographical map of Panama, shown in the lower left window. For each province or indigenous region (equivalent in Panama to a reserve), there are links to each of the schools' "Who Am I?" maps, as is shown in a partial display of the schools of the province of Chiriquí. The top right window displays the concept map for the school "El Limón," which describes details about this school. This school consists of only a computer aid and two teachers, one covering first, third and fifth grade, and the second covering second, fourth and sixth. The map shows the icons that link to the teachers' "Who Am I?" maps.

It is very common to see in the CmapServer's logs the result of searches by teacher name --most likely teachers searching for themselves (or for a colleague). Having their maps linked to the *Conéctate* concept map provides a sense of belonging -- their school is now *part* of *Conéctate*.

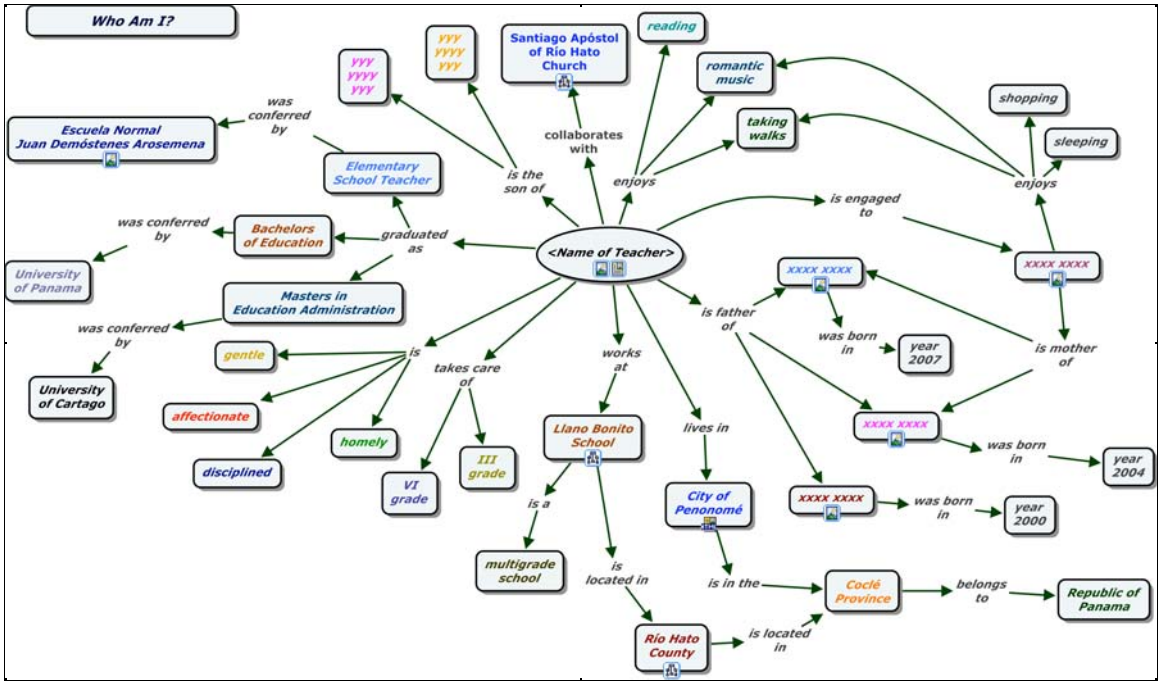

Figure 2. A "Who Am I?" concept map prepared by a teacher (proper names have been removed). It includes a link to the "Who Am I?" map of his school, links to maps the teacher prepared on his Church and on his County, links to pictures of himself, his children, and his fiancé, and links to Web pages of his city. The school is small, in a rural community, so he is responsible for two grades (III and VI), but the "Who Am I?" maps of his grades are not yet linked to his map.

3.2 A Mesh of "Who Am I?" Concept Maps

As the teachers returned to their schools from the workshops, they began asking the students in their classrooms to make their own "Who Am I?" concept map. The students would also collaborate in preparing a "Who Am I?" of their classroom. The maps of the students could now be linked to the map of the classroom, and the map of the classroom to the teacher's map and to the school's map. Soon it became obvious that "Who Am I?", which

[2] These maps were not translated to emphasize the authenticity of the Web pages.

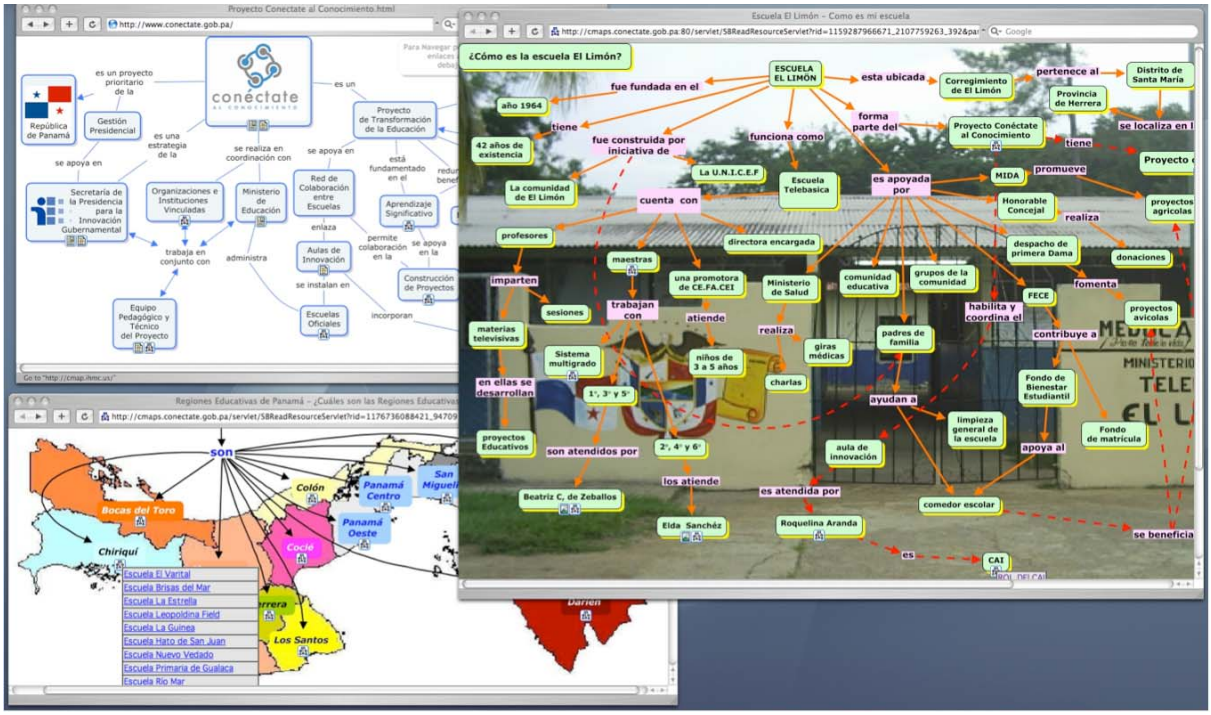

Figure 3. From the *Conéctate* concept map Web page in the top left window, a link opens a map with all regions of Panama shown in the lower left window, from which links lead to the "Who Am I?" concept map of each school in the Project, as is exemplified by the map for the Escuela La Unión, displayed in the window at the right.

was introduced as a focus question for the first map in the teachers' workshops had become a collaborative effort on its own that was resulting in linking all participants in *Conéctate*. Figure 4 depicts the "mesh" of "Who Am I?" concept maps that has resulted. Starting from *Conéctate's* Web page concept map, links lead to a map of Panama divided in regions and to maps describing collaborative project between schools in *Conéctate*. The regions map has links to each of the school's "Who Am I?" concept map, which, as explained earlier, is housed in the CmapServer physically at the school (unless an Internet link has not yet been established at the school). Each school's "Who Am I?" map reflects the idiosyncrasies of the school, with different content and images. We recommend that the map should have at least links to the "Who Am I?" map of the Principal, each teacher and, directly or indirectly through another map, each class, and to the projects in which the school is involved. Additionally, some schools have created concept maps about other activities or organizations they are collaborating with and linked them to the school's map. Each teacher's map, as shown in Figure 2, is very personal, showing in part the teacher's degrees, but often describing the family with links to pictures. The map in Figure 2 has links to a concept map about the Church the teacher belongs to, and of the County where he lives. We propose that each class build their own "Who Am I?" concept map and link it to their school and to their teacher's maps. From the class's map, a link leads to each of the student's "Who Am I?" concept map. Students enjoy creating this map, and teachers are starting to take advantage of a unit on biographies that is part of the Panamanian curriculum to introduce the construction of the map. As all concept maps that a student saves on the school's CmapServer (in their own personal space as assigned by Nicho) are automatically published and available to everybody on Internet, we are proposing that students begin selecting from the knowledge models that they have constructed and create a portfolio of their best work to link to their "Who Am I?" concept map.

As the *Conéctate* progresses, students will be able to navigate to the concept maps of any other student in the country, thereby contributing to a sense of community. As students start collaborating with other students, they can easily search for their peers' concept maps and learn who they are and what their interests are,. As the mesh grows, eventually all participants in *Conéctate* will be linked together.

3.3 Status of "Who Am I?"

The "Who Am I?" effort began way into the second year of *Conéctate*, when thousands of teachers had already participated in the workshop, and hundreds of schools were already part of the project. An effort is in place to incorporate all these participants into the mesh. To get a feeling for the current level of participation, 356 schools were surveyed early 2008, out of 573 that were at that point part of the project. Out of these, 218 (61%)

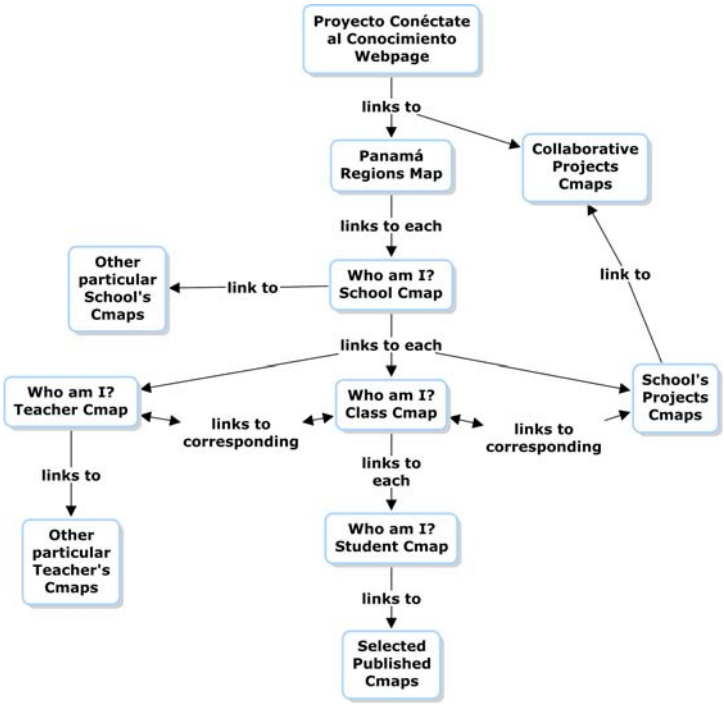

Figure 4. Starting from *Conéctate's* Web page concept map, links lead to the "Who Am I?" map of each school in the Project, from which links lead to the principal's, teachers', classes' and students' "Who Am I?" concept map. Participants link to their personal map other concept maps or resources that they select.

had a school "Who Am I?" concept map. There were 1248 teachers' "Who Am I?" maps, and 3968 students' maps. However, we are aware that a lot of the students construct their map and never link them to the school or class map, and so an extra effort is required to make sure the maps are linked into the mesh. "Who Am I?" has become a popular first map to ask of students when introducing them to concept mapping, but being an initial map the students don't yet know how to link them to the schools' other concept map.

4 Discussion and Summary

The construction and publishing of the "Who Am I?" map generates motivation and a sense of pride of belonging to *Conéctate* in teachers and students. Principals and teachers return from the training workshop with their 'school portal' already on the Web and linked to the *Conéctate's* Website's maps. They can "show off" their achievement upon their return to their community. Building the "Who Am I?" map for the School has also served as a means to get the teachers and Principals to collaborate, in many cases learning how to use features like synchronous collaboration in CmapTools while jointly building the maps. This has taken place during the workshops, or, in the case of schools that joined *Conéctate* before this effort got underway, by meeting at the school to elaborate their personal and schools' maps.

The "Who Am I" project makes the teachers and students aware of the power of "publishing" their knowledge on the Web, of sharing and making it available to others. In *Conéctate* we emphasize the power of the Internet as a publishing and sharing platform, not limited to an information consumption tool. By publishing their "Who Am I?" map during the workshop and then "Googling" themselves and colleagues, teachers became much more aware of the power of being able to easily publish their concept maps on the Web than teachers in previous workshops. They then became more interested in publishing other maps. For example, during a workshop, Vielka Gálvez, a teacher from a rural region, made a Google search about the community she lives in (Remedios, Chiriquí), and found only one Web page. Concerned that there was nothing about her community, she constructed a concept map describing it and linked it to her "Who Am I?" map so that the world will know "who we are, what we do, what we have, etc." The teacher was responsible for "putting her community on the Web". This was the first time she had ever been in touch with Internet.

"Who Am I?" also serves as a good first map to ask from teachers or students who are learning concept mapping. Through interviews we found many students who proudly told us that they "learned to use the computer by making the 'Who Am I?' map"; that they "learned how to add photos, backgrounds and color the map"; that they are "happy to share their map with children around the world through the Internet"; that they "talked about things that I like and I dislike"; and that "my 'Who Am I?' map is different from that of my classmates." Thus, constructing the "Who Am I? concept map allows the student to think about themselves, it represents a platform on which to build and publish their knowledge based on their personal experience, helping reinforce their self-image by having to make public a description of their attributes, features, personality, place where they live, family, opinions, ideas, thoughts, friends, etc. Exteriorizing or making public a students' knowledge and feelings is a key characteristic of concept mapping. Teachers report finding out about problems in students' lives throught their "Who Am I?" maps.

The "Who Am I?" map is being incorporated into many places of the Panamanian curriculum. The English teacher at the Toribio Berrío Sosa School has her students do their "Who Am I?" concept map in English. In the Antonio José de Sucre School, the teacher Vielka Valdés uses the "Who Am I?" concept map in her Religion classes. It has been used as part of the Biographies unit of the school's curriculum, and as part of the "Names" collaborative project between schools.

Finally, navigating through the "Who Am I?" maps is becoming an effective way of understanding and getting a pulse of the *Conéctate al Conocimiento* project.

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