

PATAGONIA ARGENTINA: AN EDUCATIONAL EXPERIENCE APPLYING CMAPTOOLS, DEVELOPING A DIDACTIC RESOURCE AND ITS USE AS A TOOL FOR MEANINGFUL AND COLLABORATIVE LEARNING

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Abstract: The advantages of CmapTools software program, as a tool for developing a pedagogic resource to be used in the curricula of secondary school. This program used as a platform to present, in a clear and motivating way, the activities and different resources that will be used by the students in learning a curricular content. The use of CmapTools, by students, to do concept mapping for knowledge construction and their meaningful and collaborative learning. Finally the importance of concept mapping in secondary school for both teachers and students in the process of learning.

1 Introduction

The use of digital means, and particularly CmapTools -developed by the IHMC- aims at training students in the use of concepts, principles and skills for the analysis and design of information. It also tries to help the student to comprehend keys, paradigms and tendencies of digital culture and its impact in social and communicative behavior.

The project was developed during 2007 and applied in a public school, "Liceo N° 1 José Figueroa Alcorta", depending of the Government of the City of Buenos Aires, Argentina, with students of 4th year of secondary school (16 to 17 years), - with limited economic resources-. This project aims at: a) helping these students to access to technology, as, otherwise, it would be more difficult for them to do so for, as in most cases, they have no computers at home; and b) developing their creativity and innovation skills promoting a better inclusion in a highly technological world.

For several reasons, a special characteristic of students of this school is their rare commitment to study, which is evident in their low performance, small participation in class, difficulties in written and oral expression, and scarce association of ideas and meaningful thought. These factors have motivated the application of this tool, like a resource to improve their way of expression and learning from knowledge building in a meaningful way.

2 Project Synthesis

This project proposes the study, regionally and as a whole, of a unit of Geography of 4th year secondary school, which studies Patagonia Argentina in its physical, social and economic aspects (Ontoria, 1994). The students, using visual-learning tools, research on Patagonia. They prepare concept maps in CmapTools using the information searched in the Web and the interaction with Google Earth and Google Map for geographic location, for knowledge building and collaborative learning.

3 Project Development

CmapTools were used as a platform to develop this project, because this program offers public server and on-line application. In addition, this program provides the link with other resources such as Web links, Google Earth and Google Map thematic maps, Power Point and documents for the presentation of activities, or another concept maps; available in any computer connected to the web.

Finally, a Web page was created, containing all the information needed to carry out the research activities required, and, with the advantage that it can be used again in other classes or by other teachers.

The didactic resource in Figure 1 shows the topics to be developed, the final activity and the references of the resources to be used. Its address is:

http://cmapspublic3.ihmc.us/servlet/SBReadResourceServlet?rid=1208641111890_576463427_4847&partName=htmltext

This page is the result of the work Patagonia Argentina, done in CmapTools, and saved in the folder PA// IHMC Public Cmap (3).



Figure 1

In order to encourage the student's meaningful learning, emphasis was made on the organization and selection of the information presented, taking into consideration, what the learners already know (Ausubel, 1968). To accomplish it the following activities took place: selection of reliable and valuable Web links, concept mapping to access to information, and, as final activity, elaboration of specific cartography on Google Earth and Google Maps.

In every sub item (physical setting, population, agriculture, etc.) students must do the activities prepared in concept maps using the resources proposed. In the final activity, the student must build a concept map in collaboration, and linking the resulting maps of every subtopic as dimensions or levels of the summary map. (Novak, 1998). In the summary activity a model of map, which allows the student to consider the whole structure of the region as a unit, is proposed.

4 Experience implementation

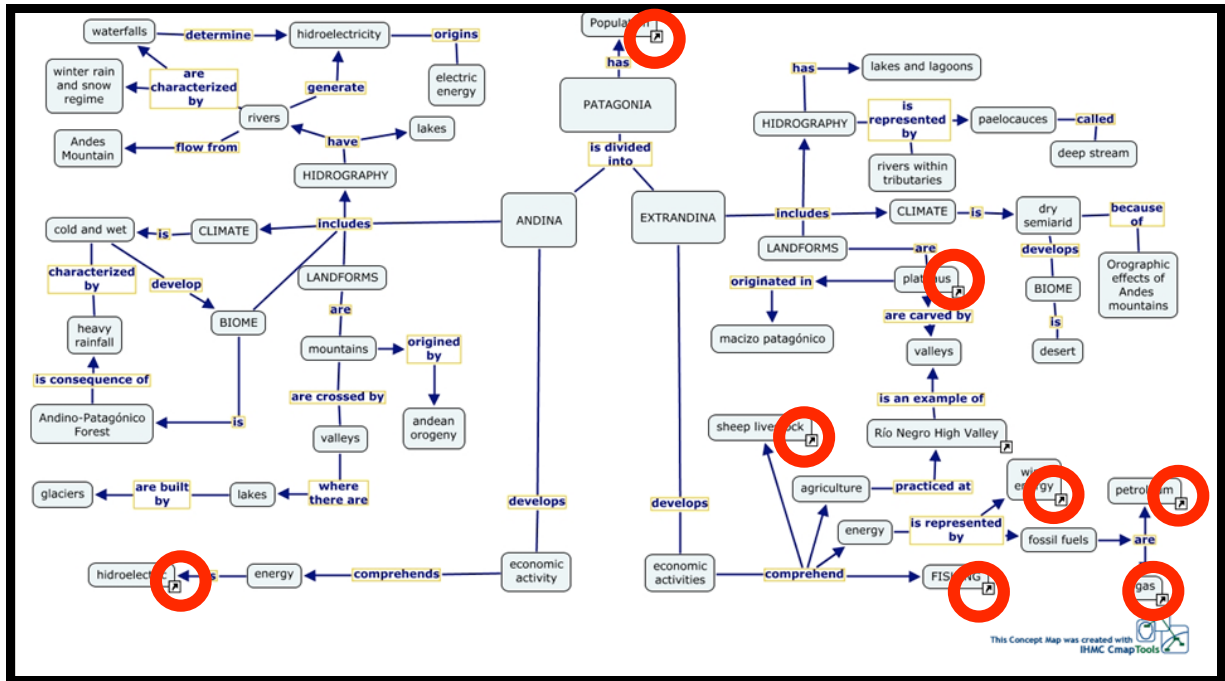
The students prepared the concept maps on every subtopic to study about the region, following the proposed activities and the information obtained from the Web links, cartographic and concept maps. Although it was the first time the students were handling virtual tools for concept mapping, being CmapTools a very intuitive and friendly-use program, it was easy for the students to understand how to use the program, to do the work and to keep it in a folder of the Cmap Public Server.

After preparing their concept maps on every subtopic in groups –since in this school there is not a computer available for each student- using the same program, an activity of synchronous collaboration was made, all the groups together, elaborating a summary map.

As soon as a concept map on every subtopic (Population, Energy, Fishing, Agriculture and Livestock) was obtained, working in groups, those maps were linked, obtaining only one concept map built by the entire class (Figure 2), which could be found at:

http://cmapspublic3.ihmc.us/servlet/SBReadResourceServlet?rid=1208699945250_44012042_9090&partName=htmltext

In this way, significant knowledge was achieved, due to the important contribution of all pupils.



Picture 2 – Summary map. The shortcut arrows on the concepts bottom right corner are the links to the subtopic maps.

5 Advantages

5.1 For teachers

The use of free software programs, easy to download and with minimum hardware requirements, and compatible with the ubiquity characteristic of the Web 2.0, like CmapTools, become technological tools, all of them helping pedagogic projects. (Novak & Cañas, 2004). Likewise, the simplicity of its use, allows to develop didactic resources following the proper pedagogic needs, without the assistance of computer experts, and practically, without previous special technical knowledge. These characteristics demonstrate the possibility of re-usability of these resources in new situations, contexts, in addition to the possibility of being able to share them.

The application of a large range of resources inside the presentation -as Web links, simulations, images, videos, maps, etc- help the teacher to improve the process of education, bringing the student over to reality, especially in subjects where the image has an important role in the illustration, such as Geography.

The use of software programs for concept mapping also allows the teacher to observe how the student builds the knowledge (Novak & Gowin, 1988), his wise moves and errors, and to advise and orient him in this meaningful learning process.

Likewise, the methodology applied in this project, and specially, the use of concept maps, facilitates and promotes the interaction of the different disciplines (Morin, 1998), connecting concepts of concept maps developed in other subjects.

5.2 For students

With the application of concept maps students develop autonomy in the knowledge building, develop skills associated with reading and writing, by linking and hyper linking that favor constructive learning.

The students gain access to new computer tools from a content curricular, and acquire new efficient methodologies for the study. In the particular case of this experience, realized with students of more limited economic resources and with difficult access to technology, it is a way of preparing them for a better social inclusion in this highly technological world. Concept mapping with computer tools favor motivation, innovation, and creativity in students, being all of them important conditions for their future labor integration. (Barkley, 2005)

From my personal experience in teaching, I have verified that the students show major predisposition to study, to work in class, and achieve better performance, when they apply specialized computer tools in knowledge building. Those students, who in a traditional class are passive and indifferent, show a positive and proactive attitude towards work. I have also observed that concept mapping using CmapTools generates an additional motivation in students that feel they taking part in their knowledge building, having discovered their own wise moves and errors, and enabling them to remember much more what they learn.

Another additional advantage of the use of concept mapping, is that it avoids the mechanism of "copy and paste", since the student necessarily must elaborate the information. When concept maps are prepared it is essential to realize a good analysis of the information (Novak, 1998). This proposal makes the student more reflective, with capacity of analysis of information and discourages him to study by heart.

There is also a more active participation of the student, since, in addition to reading, he can write in the network. It also facilitates the interaction and creation of his proper productions, encouraging collaborative, cooperatively and open learning. The collaborative work promotes the socialization of learning and achieves a more improved and finished product favored by the interactions, negotiations and dialogues that cause the new knowledge. Students learn one of others, developing not only individual but group responsibility in learning.

1. Conclusions

After applying this project when teaching the Patagonian Region, I have verified that much more positive results can be achieved when concept mapping and innovative tools as CmapTools are used instead of traditional methods of education.

Sometimes, some students show their preference to traditional methods, since these demands less effort; nevertheless, the same students admit that they remembered much more what they had learnt and it was easier for them to integrate their knowledge using this methodology. Moreover, in future occasions they chose this tool for new activities.

The application of synchronous collaboration, proposed by the program, promotes a more active participation of students, since it facilitates dialogue and consensus, inside each group and among all groups, in the building of knowledge. It also improves the place of the teacher in his central roll in facilitating the learning process.

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