Climantica.org: A website for climate change education

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Introduction

Climántica is an online environmental education project that aims to exchange ideas and experiences; produce interdisciplinary teaching materials; enrich the Environmental Education syllabus and deal with environmental issues linked to climate change. This paper outlines the key content and strategies of the project.

Climántica is closely aligned to the educational principles set out in the Galician Action Plan Against Climate Change. A trilingual site addressed to all educational sectors as well as the general public, Climántica seeks to harness the knowledge and experience of teachers worldwide and the capabilities of web 2.0 technologies to develop the project on a global scale.

Principles, aims and theoretical framework

Established during the academic year 2006-2007, Climántica was conceived as an educational project that would work within a range of educational environments and contexts, but first and foremost as an educational response to the 21st century challenge of climate change. It soon became clear that this challenge would demand an exploration of education from a global perspective. It was therefore imperative to search for an approach and space different to that of the contextual pedagogical model so successfully introduced through the New School's educational principles in the last century.

Climántica has grasped the opportunity to explore the global impact of climate change from within a range of educational contexts: regardless of age, nationality, culture or language. From its inception, the project has been committed to developing its online presence (www.climantica.org) with the following objectives:

1. To develop an online Environmental Education model to facilitate the exchange, evaluation and dissemination of ideas, experiences and initiatives.

2. To enrich the syllabus through Environmental education, in response to the wide environmental issues concerning climate change and its impact on society.

3. To develop an interdisciplinary teaching methodology for Environmental Education, using climate change as a common thread.

4. To extend the reach of Environmental Education to a global level, by taking advantage of web 2.0 capabilities to make education global, comprehensive and adaptable to different contexts.

As far as its theoretical framework is concerned, Climántica is based on the project methodology originally proposed by Kilpatrik (1921) and later developed by well-known education researchers such as Dewey (1958), whose ideas inspired the development of critical thinking on contemporary scientific issues, as well as the recognition of the teaching potential of IT and the media. The project has also been influenced by other key theories in the field of education, including those dealing with social constructivism, communication and argumentation processes in the classroom (Toulmin, 1958); the implementation of Environmental Education (Sóñora et al., 2001); and research on students' ideas about climate change issues (Sóñora & García-Rodeja, 1996).

Climántica: An exploration of the site

The Climántica website is organized under the following sections:

Start: Visitors to the site can read the latest news about the project through the blog, or by accessing the units through the navigation buttons, e.g. Units 1 & 2: 'Does climate really change?' 'If you burn, you warm'. (figure 1)

Figure 1: Does Climate Really Change?

Teaching: This section provides online learning units and courses.

Climántica TV: Here visitors can view videos of lectures and seminars for the courses, as well as a number of interviews and documentaries on environmental issues.

Climate for kids: Aimed at 12 to 15-year-olds, this section of the site encourages students to investigate firsthand the effects of climate change on the planet. Students learn how to record weather data, as well as make their own weather-recording instruments and devices. Data collected by the various school weather stations is uploaded and available to view on the site. There are also a number of interesting stories on climate issues.

CLMNTK: This online game simulates the repercussions of overdevelopment for the inhabitants of a highly populated town in 2015. Environmental destruction can only

be averted by reconciling the desire for progress and economic development with a respect for nature and the welfare of the population.

Blogs: All schools participating in the program have their own blog, where they can post news and resources linked to the project. There is a centralized blog for each level, which links to the various school blogs. As well as schools, a number of countries participating in the project also maintain blogs, some of which deal with specific environmental issues.

Library: The library links to downloadable teaching materials, comics and stories.

Primary education: This section offers a number of online games/activities (comics, stories and videogames) aimed at 10 to12-year-olds. Based on the scenario of the family, these activities give students insight into the changes in the use of energy sources – for transport, consumption, waste management and climate control – over three generations. The purpose of the game is to focus students on proposing solutions to the issue of climate change in a simple, intuitive yet effective way.

Climántica: Site development

The site has been developed in eight sections (figure 2), each dealing with a key environmental issue: global warming, energy, waste, water, biodiversity, land planning, rural environment and urban environment.

Figure 2:

Each section is produced in two stages (figure 3) fully available on www.climantica.org. During the first stage, Climántica's team produces and publishes a teaching unit, which provides materials and resources for use in a variety of educational contexts. In the second stage, all the information is uploaded to the website. Users can log on and navigate through the units under the Teaching section. Teachers play an active role in producing the content, as they are invited to participate

in pilot sessions. As a result, a number of teachers have been invited to work with the Climántica team in designing educational materials, drawing from their own experience and skills. Through this collaborative approach, Climántica is developing its potential to be part of an expanding, interactive global knowledge base.

Figure 3:
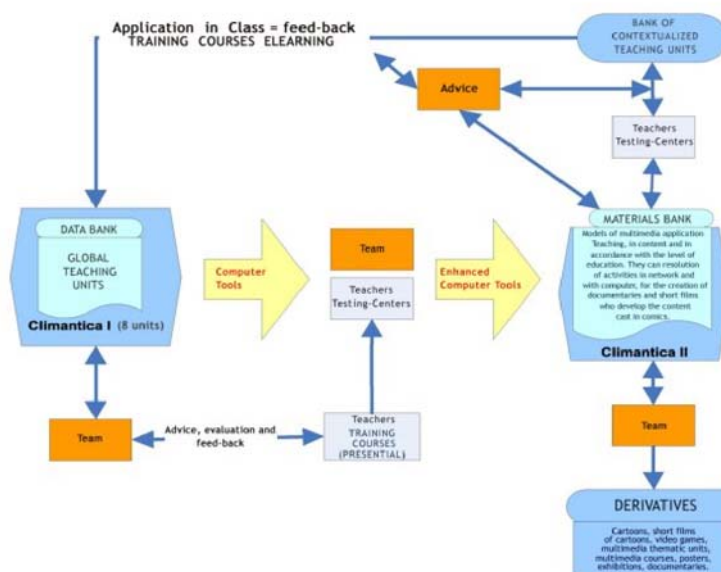
Students also have an active role in the Climántica network, as they are able to communicate and interact not only with their classmates, but also the world at large. Through the Climántica project, students become instructors – demonstrating the effects of climate change to the school community through a number of pilot projects: The Arctic and Antarctic Effect; The Development of Hurricanes; The Absorption of Solar Radiation; The Greenhouse Effect; The Thermal Regulation of the Ocean; Evidence of Carbon Dioxide; Ocean and Atmosphere Circulation.
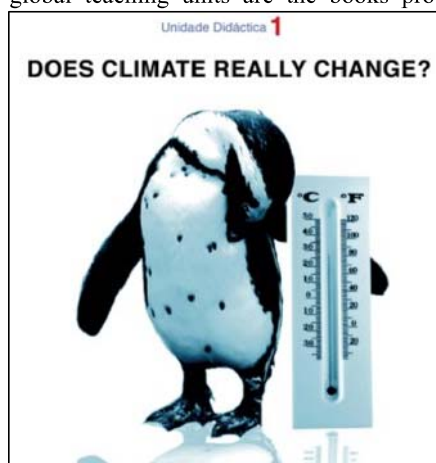
In addition, students have the chance to participate in interactive, group activities – such as roleplays, games and workshops – based on climate change. Some examples are: Climate Change Dynamics; How Much Does our Energy Dependence Cost; The Hidden Element Game; Peak Oil (creative workshop); Is Carbon Dioxide Responsible for Climate Change; Responsible Consumption (card game); "When we run out of water" (creative workshop); International Climate Summit; 10 Questions on Climate Change; Advertising and Consumption (creative workshop). Students can also produce papers for publishing to conferences, the school journal CLMNTK, and the web. Students also participate in observation networks, which provide weather and climate data to the Galician Meteorological and Water Services.

Teaching material produced by Climantica.org

The teaching material covering the first two units of the project – climate change and energy – is outlined below:

Unit 1: Does climate really change?

This is the first 'global teaching unit' of the project (Figure 4). Within Climántica, global teaching units are the books produced during the first stage of the eight sections of the project. Although these are books of about 200 pages, we refer to them as 'teaching units', as this best conveys their structure and the style in which they are written. The content is arranged sequentially, with each section and sub-section suggesting activities for teachers to develop in class.

The units are qualified as 'global' for three reasons. Firstly, they are not aimed at a particular level or subject. The units are multidisciplinary and cater for a range of ages and skills. Secondly, they are flexible enough to provide content for the whole unit – all other supplementary materials can be adapted from them. Finally, the contents can be used worldwide. For example, the first book, or Global Teaching Unit, published in February 2007, has been translated into Spanish and English in HTML version[122]. It can also be downloaded in Galician[123]. An e-book is also being produced in Spanish.

As to content, the book starts by distinguishing between weather and climate, focusing on the difference a degree makes on global temperature. Using geological actualism – a basic principle of geology – the book investigates the causes of climate variations according to the indicators used to interpret the usual or natural geological tendency of climate changes. This allows us to understand how our actions in the present will impact on the future. The book examines the effects of human activity on climate and deals with the impact on terrestrial and aquatic ecosystems, as well as the ethical, political, economic and social effects.

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[122] http://climantica.org/climanticaFront/es/page/unidad?u=01&c=01
[123] http://biblioteca.climantica.org/gl/biblioteca/unidades-didacticas/unidade-1

Unit 2: If we burn we warm. (figure 5)

This book[124], published in March 2009, provides the contents for the second unit of the project. Using a multidisciplinary approach, it deals with the origins of climate change, tracing a history of energy use that begins with the industrial Revolution and culminates in the energy crisis. The book examines how the use of firewood, and the era of the hydraulic forge, caused massive deforestation. Moving from the Industrial Revolution onwards, the text covers the expansion in the use of fossil fuels in the 20th century, due to the use and abuse of electricity vectors and internal combustion engines. Due to such rapid expansion and development, the twin issues of the energy crisis and climate change were firmly in place by the end of the 20th century. As this unit makes clear, the challenge of the 21st century is to tackle it. The book positions nuclear energy as the latest energy source 'to deal with'. It then discusses renewable energy, outlining the potential of cleaner, more sustainable energy sources such as hydrogen and nuclear fusion.

Stage II: Supplementary materials for Units I-2

The materials published for Stage II have been adapted and contextualized to the first two global units. The latest one to appear is the first of a five-volume collection entitled: *Let's Learn with Climántica Schools*[125]. Aimed at students from 10 to 12 years old, the volumes in this collection cover the eight Climántica units, and are focused on five topics: Energy and Climate Change, Waste, Water, Biodiversity and Land. The first volume covers the first two units of the project. It includes worksheets for students, plus guidelines and answer keys for teachers. In keeping with the aim of the unit, the message this text carries is: "We live, work and play in a very different way to our ancestors. This has caused climate change, but I can help to stop it".

In order to deal with climate change and its possible solutions in an intuitive and syncretic way, two comics were produced for the two first units of the project. They are part of a collection entitled: *Palmira e Marcial Odisea Medioambiental*[126]. Published in Spanish, English and Galician, the comics aim to meet the complex challenges of climate change through fantasy and fun.

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[124] http://biblioteca.climantica.org/gl/biblioteca/unidades-didacticas/unidade-2
[125] http://biblioteca.climantica.org/gl/biblioteca/unidades-didacticas/escolas-climanticas
[126] http://biblioteca.climantica.org/gl/biblioteca/comics/numero-1

This sense of fantasy and fun continues with the first novel of the project *La Tormenta de C* in the collection *Cuentos Climánticos*, published in Spanish and Galician[127]. In addition, the first volume of *Let's learn with Climántica Schools* includes the first videogame of the project, CLMNTK, and is linked to the key themes of the book. This networked, online game involves decision-making on land planning and energy management within the framework of our 21st century climate change society[128].

Further opportunity for students to interact with the project is offered through the book *Climaeucambio*, which provides a number of multidisciplinary projects for 12 to 15 year-old students[129]. Students are given the chance to become involved in pilot sessions using data obtained directly through Meteogalicia: the Galician Meteorological Agency. For this part of the project, two online systems have been established:

1. The first edublog/eduforo system[130]: Implemented by 16 and 17-year-old students, participants discuss the role of contemporary frontier science in finding solutions to climate change. The main aim of this edublog has been defined as: "The human capacity to change the planet and the environment has impacted to such an extent as to cause climate change. Through scientific advances such as particle physics, nanotechnology, astrophysics, molecule biology and genomics, we can find solutions to the problem".

This part of project[131] has been highly successful in terms of encouraging student participation and interaction within the web 2.0 framework of the project.

2.'Meteoescolas'[132]: Meteogalicia has implemented an online system to upload and share data obtained from school weather stations.

Results

After its first two years of operation, Climantic.org has achieved the following:

- Over one million site visitors. This includes a substantial number of international visitors from 111 different countries. Over 10 percent of these are from Latin America.

- The five blogging systems support 95 regularly updated weblogs. This amounts to a networked community of more than 8,000 users, composed of teachers and students.

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[127] http://biblioteca.climantica.org/gl/biblioteca/novelas/a-treboada-de-c/version-completa
[128] http://xogo.climantica.org/?locale=es
[129] http://biblioteca.climantica.org/gl/biblioteca/unidades-didacticas/climaeucambio
[130] http://blogguia.climantica.org/
[131] http://ccmc.climantica.org/
[132] http://meteogalicia.es/galego/observacion/climantica/meteoescolas.asp

- The number of downloads, users of the multimedia, and linkbacks to the site, are growing exponentially (figure 6).

- 12,000 copies of the book *Climaeucambio*; 4,000 copies of the first teaching unit; 10, 000 copies of the first issue of the comic and 5,000 copies of the first novel have been distributed.

- Over 1,000 teachers have attended Climántica training courses.

- During the academic year 2007-2008, 983 students attended Climántica workshops in their schools. During the academic year 2008-2009 the number of students more than doubled to 2,287.

- 288 students took part in the 1st Climántica Student Conference. Their papers have been published in the journal CLMNTK and in the Library section of the Climántica website (climantica.org). In 2009, 581 students took part in the 2nd conference.

- Al Gore's team awarded the project a distinction in April 2007. Following the award, the Climántica team was invited to meet with Mr Gore in Seville in October 2007. In addition, Climántica's director was invited to be part of a group of over 100 international climate change experts who met with Mr Gore in Amsterdam in October 2008.

- As part of the 4th Seminar on Answers to Climate Change (Córdoba, May 2007, the Spanish Climate Change Agency nominated Climántica as a model for good practice for its contribution to encouraging communication and participation. The project also aroused interest in the 5th Seminar (Zaragoza, April 2008) and the 6th Seminar (Segovia, April 2009).

- Climántica's contribution to climate change education was recognized by the UN in New York, 2008; and by the High Commission for Climate Change in Madrid, 2009. The project was further recognized as a good practice model (following Article 6 of the UN Convention) in Stockholm in May 2009. These events have led to the cooperation and support of the UNESCO National Commission in Portugal, which is supporting teacher training for 25 teachers from 15 teacher training Schools in Portugal.

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E-counsellor training module: A pilot seminar

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Introduction

The training and professional development of guidance counselling practitioners has historically analysed separately, not as diametrically opposed terms but as two different constructs, the culture of preparation, i.e development/training; and technique and application competence (professional development). This perspective was typical of the rather static view of the profession that has traditionally dominated the field. This perception is now obsolete. Today, the formation of the counselling professional is conceived as an integration of various key components including culture, context, knowledge, ethics, didactic functions, methodology, evaluation etc, with relation to a particular practice in context (Eraut, 1997).

The training and professional development of guidance practitioners needs to consider: the stages of the guiding context (needs assessment, functions and counselling competencies); program design (objectives, curriculum content, resources and methodological strategies); program implementation and evaluation (criteria, indicators); and decision-making (Sobrado, 2003).

The design and training itinerary for guidance practitioners is one of the core processes in achieving the development of Information and Communication Technologies (ICT) as applied to the guidance process. The basis of the training framework, therefore, must be based on the mapping of ICT skills onto the e-counsellor profile.

In this paper, we present the design and outcomes of an ICT-focussed module (module 23) of a guidance professional training course: 'Applying safeguards to protect clients using ICT for guidance purposes'. The module is of 25 hours duration and equals one ECTS credit.

The pilot seminar was conducted at the Faculty of Education Sciences at the University of Santiago de Compostela in April-May 2009, and was attended by 18 educational and professional counsellors.

Project objectives

1. Develop skills, knowledge and understanding in the use of ICT media and software to satisfy client needs in the guidance process.
2. Provide the opportunity for a critical review of client use of ICT.
3. Identify ethical principles associated with the use of ICT in guidance.