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THE INTERNET AND THE GEOLOGY TEACHING IN PORTUGAL

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In Portugal, Internet access is granted by private providers (mainly to commercial enterprises and private individuals) and by the National Network for the Scientific Community (http://www.dns.pt/) which links academic and research institutions. Over the past four years, we have seen a real explosion of the Internet. The number of sub-domains under the PT top domain exceeds 4000; quite surprisingly, considering that Portugal is a small country with 9,9 million inhabitants, this number is increasing by 100 each month. Currently there are two main programs, supported by the Government, in order to develop an educational approach to the Internet:

"Internet na Escola" (http://www.uarte.mct.pt/eng/) is an initiative led by the Ministry of Science and Technology within the framework of the "Green Paper for the Information Society". By September 1997, all 5th to 12th grade schools (more than 1600) as well as some primary schools, associations (teaching, professional and scientific) and libraries were connected to the Internet through the Science, Technology and Society Network. This network promotes communication between the schools and the scientific community, and offers free Internet access with an advanced ISDN connection, technical assistance and helpdesk services.

"Nónio Século XXI" (http://www.dapp.min-edu.pt/nonio/ingles/docubase1i.htm) is a program created by the Ministry of Education to promote the production, application and generalised usage of the information and communication technologies (IT) in the Portuguese educational system.

Teaching and learning

The preparation of scientific and pedagogical materials to be posted on the Internet is not a priority for the Portuguese geological community yet. This lack of initiative is particularly serious because of the huge amount of information available on the Internet (scientific and pedagogical) that remains inaccessible to Portuguese students (mainly the younger ones) due to difficulties in understanding foreign languages. After all, the Portuguese language is the 8th spoken language worldwide, 3rd among the occidental languages, after English and Spanish. Currently, the working projects that involve the preparation of pedagogical materials distributed on CD-ROM and via the Internet are :

Geopor (http://www-si.fct.unl.pt/units/dct/GEOPOR/GPindex.html)
Geopor - Geology in Portugal — is a site containing a wealth of information about the Earth Sciences in Portugal. Users are able to make contact with representatives from the national geological institutions, consult thesis and paper abstracts, learn about recent advances in Geology, obtain information through Geopor mailing-list, enter into discussions with mailing-list subscribers, etc. This year, Web pages for students and teachers will be developed with information about university Geology courses, virtual field trips, simple experiments to carry out during classes, a database of photographs of some Portuguese geological features, useful links to other sites, etc.

Geira (www.geira.pt)
"Geira" - the name of the ancient Roman road linking northern Portugal with northern Spain - is a project, vast in its scope, with two main aims: (a) the diffusion of the scientific and technological potential of the Northern Portugal; and (b) the use of science and technology in the valorization of the cultural heritage and in the protection and conservation of environment. Regarding Earth Sciences, this project will develop material on the four National Parks in northern Portugal to be distributed on CD-ROM and via the Internet.

Martelo virtual - is a free course running in the University of Minho specially focused to future Geology teachers. During the work sessions, the students are introduced to IT applications aiming to give them a minimum background for their future professional life. Among other items, this course deals about how to obtain accurate information on the

Web, exchanging e-mail messages, how to use educational CD-ROM's and how to create simple Web pages.

Main sources of geological information

• Earth Sciences Department - University of Coimbra
(http://cygnus.ci.uc.pt/cienterra/dct.html)

• Earth Sciences Department - University of Minho
(http://delta.ci.uminho.pt/ct/Engl/Homepage-e.html)

• Earth Sciences Department - UNL
(http://www-si.fct.unl.pt/units/dct/DCTIng/DCT.I.html)

• Geology Department - University of Oporto
(http://www.fc.up.pt/depts/geo/indexi.html)

• Geological and Mining Institute (http://www.igm.pt)

On-line Portuguese geological journals

• Memórias e Notícias - Earth Sciences Department, University of Coimbra —
(http://cygnus.ci.uc.pt/cienterra/publ/memnot.html)

• Gaia - Natural History Museum — (http://www.naturae.pt/gaia/)

• Quaternary Studies - Portuguese Association for the Study of Quaternary —
(http://www.terravista.pt/nazare/1167/estquat.htm)

Prospective

The use of computers in the classroom, allowing the presentation of multimedia materials, is becoming common in Portuguese schools. Some teachers report the high motivation of the students using Internet to search information, contact other colleagues or researchers (by e-mail interview), and to create Web pages. Difficulties are mainly related to lack of preparation of the teachers in the use of IT on teaching. Due to the strong institutional effort, previously referred, we expect that IT applications in teaching and learning Geology will soon increase in number and quality. The actual existence of capable hardware in all the Portuguese schools is a great potential that will allow a vast use of multimedia materials either by students or their teachers.