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**@SCIENCE**

## **Annual Report**

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***eContentplus***

This project is funded under the *eContentplus* programme<sup>1</sup>,  
a multiannual Community programme to make digital content in Europe more accessible, usable and exploitable.

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<sup>1</sup> OJ L 79, 24.3.2005, p. 1.

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## **2 Project Objectives**

The @Science network addresses the aim of the eContentPlus programme by facilitating blind and partially sighted to access scientific digital resources and by promoting access to scientific culture at university. Accessibility of the digital contents to any citizen is a key objective of the eContentPlus programme. The @Science network aims to "contribute to better conditions for accessing, using, reusing and exploiting digital material", and it contributes to "the creation of added-value products and services at European level". This can be achieved through a long-term sustainable network which facilitates the exchange of information (e.g., techniques, methods, case studies, samples, experiences, guidelines, best practices, etc.) about how to enable blind and visually impaired students to access scientific educational material. The @Science network will have a cultural role, operating to spread best experiences and guidelines useful to any content provider (publishers, digital repositories, libraries, etc.) willing to develop digital contents accessible to blind and partially sighted. The @Science network will also be a daily tool for students, university teaching staff, researchers and university support services. Therefore, @Science contributes to "stimulate cultural and scientific/scholarly content enrichment" through the daily activities of the teaching staff and university support services, who will produce accessible educational resources. The @Science network is open to institutions and individuals who are willing to collaborate about making science accessible to persons with visual impairment.

## **3 Consortium**

The @Science Consortium is made up of six network founding partners, from five different European Countries: Italy, Slovakia, Belgium, Austria, and France.

The partners are:

- Università degli Studi di Milano - Biblioteca di Informatica, Milan, Italy. It is the project co-ordinator. It maintains the @Science network website and the document repository (see <http://www.ascience-thematic.net>). Its institutional role makes possible long-term experimentation and research about evolving assistive technology which facilitates visually impaired to access scientific documentation as well as long-term contribution to the @Science repository through documents of guidelines, best practices and user experiences. This library also takes care of dissemination activities by participating to conferences and meetings. This university library also monitors the status of the network and promotes activities to involve further participants;

- Comenius University - Faculty of Mathematics, Physics and Informatics, Bratislava, Slovakia. Comenius University was the first one in the Slovak Republic to create a specialized supporting system for students with visual impairment at university. Support Centre for Visually Impaired Students (<http://cezap-www.fmph.uniba.sk>) is located in Faculty of Mathematics, Physics and Informatics (<http://www.fmph.uniba.sk/>). It has offered its services for students with disabilities since 1993. Comenius University makes available its experience in supporting students with visual impairment. Moreover, as a university support centre, it contributes to disseminate @Science activities towards more and more university support centers, which have been recently established;
- Katholieke Universiteit, Leuven, Belgium. In Katholieke Universiteit in Leuven, two working groups, in particular, contribute to the @Science network: the "Research group on Document Architectures" and the "Working Group for Students with an Impairment". The former group ensures long-term research about digital document accessibility and a close relation to the Open Archives Initiative. The second group focuses on supporting students with special needs in university. This group works on support services networking and dissemination of best practices towards university teaching staff;
- Johannes Kepler Universitet - Institut Integriert Studieren, Linz, Austria. This institute is the best university support experience in Austria. Thanks to its participation to several international projects, this university institute makes available both experience in supporting students with special needs and research experience in assistive technology for education. Furthermore, the worldwide known International Conference on Computer Helping People with special needs is held in Linz. That ensures dissemination activities which can reach a wide public;
- Unione Italiana Ciechi e Ipovedenti, Verona, Italy. This is an association of blind and partially sighted Italian people. The activities organized are addressed in particular to students with sight impairment, to primary and secondary school teachers and also to parents of sight impaired persons. These activities can both get advantage of the communication infrastructure set up by the @Science network and also they can facilitate dissemination of best experiences concerning students;
- Université Pierre et Marie Curie, Paris, France. The Team Inova (Interfaces NON Visuelles et Accessibilité - Non Visual Interfaces and Accessibility) works inside Pierre et Marie Curie Université. It has a large experience in development of non visual interfaces and educational tools: Inova has worked on several projects dealing

with Web Accessibility (WAI-DE – TIDE TELEMATICS DE4015, WAI-DA – IST 13470, WAI-TIES – IST-2001-38471), educational tools for blind and visually impaired pupils (TACTISON, VICKIE – IST-2001-32678), Computer Games for visually impaired children (TIM – IST-2000-25298), maths for the Blind (within MICOLE – IST-2003-511592 STP – and UMCL – Universal Math Conversion Library). Especially the experience about Universal Math Conversion Library brings great advantages to improving accessibility of digital documents. This experience turns out to be essential to improve and maintain technical solutions, which are effective for exploiting digital content through speech or Braille output.

The @Science network can now rely on close collaborations with:

- Joining Educational Mathematics network (see <http://www.jem-thematic.net>). The goal of the JEM thematic network is to pool together the required expertise and to contribute to the coordination of content enrichment activities in the area of mathematics, to the maintenance of agreed standards and to the delivery of powerful synoptic high-quality user information and support pages, invoked in e-learning platforms operated by the partners. These activities will have tremendous long-term benefits for the quality of e-learning in mathematics. Collaboration with the @Science network facilitates exchange of specific knowledge and scientific material accessible to visually impaired;
- Science Access Net (see <http://www.sciaccess.net>). This network aims to improve optical character recognition for printed scientific material (InftyReader software). These tools are of utmost importance in enabling sight impaired people to access scientific content;
- Associazione Italiana editori (see, <http://www.aie.it>). This association of Italian publishers has been undertaking several activities with publishers concerning training, market surveys on electronic publishing, participation to international events, etc. Collaboration with AIE makes possible direct collaboration with over 400 Italian publishers and it ensures dissemination toward the publishing market all over Europe;
- Companies. In particular: Design Science Inc. (<http://www.dessci.com>), VEIA Srl ([www.veia.it](http://www.veia.it)) and River Valley (<http://www.river-valley.tv>). Design Science has been addressing the design and development of software for scientific word processing for many years. VEIA Srl has been working for many years about programs to assist blind and partially sighted people to read, write and manipulate mathematics (e.g. the

LAMBDA software). River-Valley works in disseminating on the Web proceedings of scientific conferences through multimedia recording;

- Universities. In particular: San Francisco University, New Mexico State University, Dublin City University, Moldova State University, and Dresden University. Collaboration with universities is essential both to ensure long-term research and to spread and collect best practices in education.
- Jacobs University in Bremen. This collaboration concerns the conversion of ArXiv (see, <http://www.arxiv.org>) repository of physics, mathematics and computer science papers into XHTML+MathML undertaken in Jacobs University. Thanks to the collaboration with the @Science network, the result of the conversion will ensure high accessibility to about 230,000 papers to blind and partially sighted.

## 4 Projects Results/Achievements

The network makes available:

- a multi-lingual website making available:
  - guidelines and best practices to make textbooks and educational content accessible to visually impaired;
  - documents about best practices in supporting visually impaired students in university scientific courses;
  - a digital repository of documents (compliant with Open Archives Initiative specifications), which archives and delivers conference proceedings, papers, screen casts and many learning objects which demonstrate state-of-the-art or emerging assistive technology solutions to make science accessible to visually impaired;
  - a mailing list about accessibility issues in science learning for visually impaired;
  - a newsletter which informs about special events in science accessibility and relevant new topics discussed on the website;
  - RSS feeds which aggregate content from the best resources on the Web;
- the proceedings of the @Science events:
- workshop Access to Science for Visually Impaired, Paris, February 27th, 2008;
- workshop Access to Science for Visually Impaired, Linz, July 8th, 2008;
- Special Thematic Session about Enablind Visually Impaired to Access Science at ICCHP, 9th July, 2008;

- Making Science Accessible: emerging opportunities for blind and partially sighted, Milan, October 20th, 2008.  
The CDs of the proceedings are available. They can be requested through the @Science website;
- the book "Guidelines to Prepare Scientific Textbooks Usable by Visually Impaired: a compendium of best practices and step-by-step instructions on how to make content accessible for the visually impaired". This book illustrates how scientific textbooks and scientific resources on the Web can be made accessible for the use by visually impaired. It is available in digital format on the website. The book on paper can be requested through the website;
- the book "Guidelines to Make Scientific Lessons, Educational Resources and Examinations Accessible to Visually Impaired". This book is addressed to university teaching staff or to university support services which do not have long-term experience in supporting visually impaired students, especially in scientific courses. The book is available in digital format on the website. The book on paper can be requested through the @Science website;
- the document about "Best Practice for University Support Services: best practices to support sight impaired students at university". It is addressed to university support services which do not have long-term experience in supporting visually impaired in university courses. It is available in digital format on the @Science website.

## **5 Target Users & their Needs**

Blind and partially sighted students meet several difficulties to go through scientific studies because of low accessibility of scientific digital content and of scientific lessons. So the main target group is made up of sight impaired students, both in secondary school or university, who are deciding to apply for scientific courses or who are undertaking university scientific courses. The second target group is constituted of university support services which need techniques and methods to facilitate blind and partially sighted students to go through scientific studies. Furthermore, publishers, assistive technology producers, university libraries and institutional or discipline repositories are involved because they directly affect the preparation and/or delivery of digital content or access tools to digital content. Also university teaching staff and researchers who write their educational material and/or research papers are addressed by @Science. @Science makes available best practices and guidelines to address many problems met by these target groups in making scientific content accessible.

## **6 Underlying Content**

Digital content involved concerns scientific learning objects. In particular: lecture notes, papers, scientific textbooks, exercise books, etc. @Science guidelines address these kind of content especially as for: PDF format, LaTeX format, XHTML+MathML format. DAISY+MathML format is highly advised for its accessibility characteristics, especially as soon as more and more DAISY+MathML compliant applications will be developed.

## **7 Impact & Sustainability**

The @Science network has aimed to join collaborations with universities, associations, other networks and companies (see Section 2). These collaborations were base upon long-term activities undertaken in the second year of the @Science network. These activities will contribute to long-term sustainability. Furthermore, most institutions in the @Science network have the institutional role to spread scientific culture to all people (including people with visual impairment). Therefore, thanks to the @Science network infrastructure these institutions will have the chance to go on collaborating in the future about problems of access to science for more and more groups of people.