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**TOWARDS AN ACCESSIBLE SCIENCE: FACILITATING
ACCESS TO SCIENTIFIC
DIGITAL RESOURCES FOR VISUALLY IMPAIRED
STUDENTS**

**D2.4 Specific education for university
teachers and tutors**

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EXECUTIVE SUMMARY

This document is part of the work package 2 about the state of the art. It focuses on the state of the art in Europe about special education in assistive technology and assistive methods for students with disability (e.g. courses, lectures, workshops, masters, etc.) for university staff, in particular for professors and tutors. At first, the need for specific learning activities is remarked. Subsequently, two categories of learning opportunities which can be useful for university staff are presented. Then the results of a survey concerning specific education for university staff about the special needs of visually impaired in scientific courses are presented.

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1 INTRODUCTION

1.1 Overview

In deliverables 2.1, 2.2 and 2.3 were examined the main barriers met by blind and visually impaired students in university scientific courses. At first, in deliverable 2.1, the need for fully working assistive tools to read, write and process mathematical expressions, as well as to create and explore technical drawings was remarked. Subsequently, in deliverable 2.2, accessibility issues concerning educational resources (e.g. lecture notes, books and exercises) were studied and state-of-the-art solutions were illustrated. Deliverable 2.3 presented how at present university support services are facing accessibility problems in science learning. What has been illustrated and analyzed up to now leads to two main conclusion:

- there exist several different assistive tools and techniques to enable blind and visually impaired students to go through university scientific studies. This not homogeneous scenario about assistive technology and the prototypic nature of many tools can be somewhat misleading for students. Therefore, qualified assistance in choosing and learning tools, often provided by university support services, is of high importance;
- most expert university support services for students with disability focus on providing students with special services concerning adaptation of educational resources in alternative formats, individual tutoring, assistance in communicating with professors and university staff, as well as training in assistive technology and in orientation.

Although activities undertaken by most expert university support services are essential to facilitate blind and visually impaired students in science learning, further activities would highly contribute to have optimum conditions for accessing technical and scientific university courses. In particular, a university context aware of special needs and applicable solutions would facilitate both students and support services. In many situations, it is not necessary to totally change the usual teaching techniques, rather, some simple changes highly improve the accessibility of learning processes. For example, some digital formats for scientific learning resources are preferable to others (e.g. source LaTeX is better than a PostScript file, see deliverable 2.2), certain computation programs or programming environments can be more usable than others through speech, Braille and magnification devices, and so on. If university professors and tutors knew peculiarities of special needs and some specific solutions, some problems would be overcome more effectively and efficiently without the need for many special adaptations. Therefore, education and training of university staff about some specific needs and solutions can play a key role to enhance access opportunities to university courses for students with special needs. The following sections present the state of the art in Europe concerning opportunities for the university staff to learn about special needs of students with visual impairment and to be trained on specific solutions.

1.2 Methodology

In order to collect state-of-the-art information about how university staff all over Europe can learn about special needs of university blind and visually impaired students in technical and scientific courses and specific solutions, the following activities were undertaken:

- search of web sites and projects presenting courses of interest for university staff;

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- review of literature about special needs and assistive technology in order to find information on existing experiences and to select universities to be contacted. In particular, the proceedings of ICCHP conference (International Conference on Computer Helping People) were examined;
 - analysis of conference proceedings which can be addressed to university staff. Some conferences presenting papers and workshops potentially useful for university staff were selected;
 - participation to conferences to look for the latest best experiences. In particular, up to now the following events have been attended: ICTA (The first International Conference on Information and Communication Technology & Accessibility, April 12th-14th, 2007, Hammamet - Tunisia), CHE (Conference on "Higher Education and disability", July 23th - 27th, 2007, Innsbruck, Austria), CVHI (Conference on Visual and Hearing Impairment, August 27th - 31st, 2007, Granada, Spain), AAATE (9th European Conference for the Advancement of Assistive Technology in Europe, October 2nd - 4th, San Sebastian, Spain);
 - preparation of a questionnaire to collect information about education and training activities for university staff. The questionnaire was part of the one prepared for deliverable 2.3. It was distributed to the @Science members who filled in it according to their long term experience or distributed it to the universities with special expertise in each country. Results from questionnaires are presented in section 3 by comparing the situation in each country. The full questionnaires were collected in deliverable 2.3 in appendix 1.

2 TRAINING ON ASSISTIVE TECHNOLOGY

2.1 Courses

This section presents the latest or undergoing training experiences about assistive technology, which have a relevant international impact. The experiences especially concerning visual impairment were selected. Since assistive tools are essential to enable blind and visual impaired students to go through technical and scientific university courses, it is important that university staff knows principles and interaction modalities. Few initiatives are addressed to university staff in particular, whereas most courses are for students themselves.

IDOL project

IDOL project is an initiative funded by the Leonardo Programme of the European Commission. One of its aims concerns the preparation of a training programme for blind people in how to use assistive technology and develop basic computer skills, that will increase their skills and confidence. Further information at: <http://www.idol-project.org>

The training programme is divided into two parts: an introductory level an advanced level. After finishing the course effectually the member will receive the "IDOL certificate", attesting the successful participation. The training course will be offered in following training centres: Jagiellonian University

Krakow, Poland, University of Silesia Katowice, Poland, University College Cork, Disability Support Service Cork, Ireland and Universitaet Karlsruhe,

Study Centre for Blind and Partially Sighted Students, Karlsruhe, Germany,

KPT Project

KEEPING PACE WITH (ASSISTIVE) TECHNOLOGY is a European Project funded by the European Commission under the Leonardo da Vinci Programme. The KPT project (October 2004 to March 2007), involves a large international consortium of Assistive Technology (AT) centres, universities, training organisations, organisations representing professionals in health, social services and vocational training, and people with disabilities. The project is coordinated by Ausilioteca, the AT Centre of AIAS Bologna ONLUS, an association for people with disabilities and their families. The project's target audience is professionals supporting people with disabilities, namely professionals who need to be aware of the impact assistive technology can have on the lives of their clients, but who lack the opportunity to update their knowledge or to find AT-related support in managing cases. In many universities, and even in initial professional training, very little is done to fill this knowledge gap.

Guidelines have been developed within the project to direct and support such training provision to the target audience. The guidelines refer to different ways of learning and contain frameworks for competency development that are related to on the European Qualifications framework (EQF). Examples of training units that meet these guidelines have also been developed. The project outcomes will be useful to staff members of AT centres responsible for training and support, university teachers, employers in health, social services and vocational training. A specific user group will be formed by professionals developing policy in (continuing) training.

Further information at: <http://www.at4inclusion.org/kpt>

IMPACT project

It aims to increase the awareness of and knowledge about assistive technology among professionals in health and social services. These aims can be pursued primarily through survey of existing and development of new educational materials to be used in different European languages (using both traditional methods as well as multimedia). The newly developed educational material consists of student's manual, teacher's manual, case studies, software and sample data. Complementary, a European network will be established bringing together persons from user groups, educational partners and service providers. This network will disseminate and enlarge the results by exchange of information (newsletter, on the web) and experiences (workshops).

Further information at: <http://www.fontys.nl/impact>

AAATE initiatives

The AAATE is the interdisciplinary pan-European association devoted to all aspects of assistive technology, such as use, research, development, manufacture, supply, provision and policy. Over 250 members from all over Europe and throughout the world currently take part in the AAATE. AAATE efforts are addressed to create the awareness of assistive technology, to promote research and development of assistive technology, to facilitate the exchange of knowledge within the field, to disseminate information about assistive technology and related issues. University staff would get advantage from AAATE initiatives, in particular: from a major international conference, held every 2 years, on all aspects of assistive technology, Special Interest Groups (SIGs) on various topics "Technology and Disability", from the official Scientific Journal of AAATE, from seminars, workshops and information events, from a regular newsletter reserved to members, along with various networking services through the AAATE website, from network of national contacts throughout Europe.

Master in assistive technology at Trieste University

It is an interdisciplinary master which examines advanced assistive technology and emerging experiences. Assistive technology applied to real situations are introduced. This master aims at properly educating disability managers who can act with high expertise in the educational and professional context. Further information at: <http://www.ing.units.it/bca>

Master in Technology for autonomy and social integration of people with disabilities (2007/2008)

The master aims at giving a general and wide experience on the technologies today available for rehabilitation, autonomy, scholastic, working and social integration of people with disabilities, aged persons, or people with a chronic disease. The didactic syllabus is made up both of theory lessons and practical sessions in laboratory. It extends from the merely technological aspects to those of everyday use of the assistive technologies from the disabled person. It also examines the aspects of rehabilitation and education.

A great importance will be given to the methodology for the individual choice of the most suitable assistive technology for the user, to the mastering of the informative and formative instruments that will allow the student, after the completion of this master, to constantly keep updated on the technological developments of this field.

2.2 Workshops and conferences

This section focuses on conferences and workshops which aim at informing and training about special needs of students with visual impairment and about support technologies.

AAATE: Association of Advancement of Assistive Technology in Europe

A major international conference - held every 2 years - on all aspects of assistive technology. The Conference is addressed to: researchers, engineers, service providers, gerontologists, occupational therapists, manufacturers and, of course, users. It is suitable both to get acquainted with the evolution of assistive technology and to learn from experiences about how specific barriers can be overcome. Paper presentations are organized in many parallel sessions. Specialized workshops are usually scheduled.

Further information at: <http://www.fatronik.com/aaate2007/>

CVHI: Conference and Workshop on Assistive Technology for People with Vision and Hearing Impairments

The specific features of the CVHI International Conference Series are:

- High quality of scientific presentations
- Friendly, residential character, giving good opportunities for networking.
- Significant involvement from young researchers in all aspects of the conference.
- Bursaries for young researchers and disabled researchers.
- Tutorial sessions by high quality speakers.

This conference can be useful for university staff both to get informed about assistive technology and especially to learn from individual experiences.

Further information at: http://www.elec.gla.ac.uk/Events_page/CVHI/cvhi/

ICCHP: International Conference on Computers Helping People with Special Needs

ICCHP will be held the 11th time in 2008. It looks back to more than 20 years of supporting the advancement of Information and Communication Technology

(ICT) and Assistive Technologies (AT) for people with disabilities, the aging population and learning difficulties. ICCHP is an important event to learn about special needs and assistive technology. Many papers are usually submitted and reviewed by experts, special thematic sessions are available and workshops about emerging or already effective assistive tools are organized. Also tutorials sessions can be attended at ICCHP conference.

Further information at: <http://www.icchp.org>

3 COMPARATIVE ANALYSIS AND QUESTIONNAIRES

This section investigates in particular education and training opportunities for university staff about assistive tools and access to scientific documentation for blind and visually impaired students. That is achieved by comparing the answers to the questionnaire prepared by the @science network members to get information about existing experiences.

Question 9

Are there courses available for learning specific assistive technologies in science learning?

- Yes
 No

If yes, please describe your experiences with these courses.

If no, do you think that offering courses to learn specific assistive technologies would be useful in science learning and why?

Summary of answers

	Yes	No
Austria – Graz	n.a.	n.a.
Austria – Klagenfurt		X
Austria – Vienna		X
Belgium		X
Czech Republic – Brno	X	
Czech Republic – Olomouc		X
Czech Republic – Praha		X
Hungary		X
Ireland		X
Italy		X
Slovak republic	X	
Spain		X

Austria – Graz

No answer.

Austria – Klagenfurt

No.

Yes, because for example cooperative learning would be promoted.

Austria – Vienna

No.

Yes, that would be useful, because the transfer of knowledge concerning the preparation of study materials and literature would contribute to the quality assurance.

Belgium

No.

Due to the increasing number of applications of students with a (cognitive) disability (like dyslexia) there might be a need for this kind of courses for students and lecturers in the future. At K.U.Leuven, some information on computer and web accessibility is included into the curriculum for webmasters and architects. This topic will also show up in Leuven's planned Postgraduate course on "diversity management".

The inclusion of this type of information in the general curriculum will definitely result in a better familiarity for all alumni with the problems of handicapped students.

Czech Republic – Brno

Yes.

Every student with visual disability at Masaryk University is offered a special IT course which covers, in addition to common techniques required from any university student, a specific training in assistive technologies. In particular cases (statistics, auxiliary sciences of history etc.), additional techniques are taught. Similar courses are offered by Technical University Prague (Tereza Centre), Charles University (Carolina Centre), and eventually by external subjects (Czech Blind United, Kafira Association etc.)

Czech Republic – Olomouc

No.

In our opinion it would be very useful because of the enhancement of scientific learning skills and consequential improvement of academic studies background in general

Czech Republic – Praha

Not at our university.

We are sure that such courses would be very useful both in the field of informatics and in pedagogic/ didactics field, as well.

Hungary

No.

Yes it would be useful, especially for students who are in the early stage of the university course.

Ireland

No.

Yes. Mathematics and science provide very specific challenges to the blind and partially sighted student and any assistive technologies available should be employed to optimum benefit. Ireland would like to learn from @science project so that more blind and vision impaired students could be equipped with the skills to study within the sciences.

Italy

No.

There aren't courses specific for technology to learn science. There are courses about assistive tools. These courses are often available in collaboration with institutions for blind and visually impaired.

Slovak Republic

Yes.

Comenius University Bratislava:

The Support centre provides individual courses for students with disabilities and for students of special education - future special teachers. They should learn how to use software and hardware, suitable for their study.

Concretely in science learning: using Braille displays.

The second year the Lambda course for secondary school pupils has been offered.

For students of informatics, future teachers of informatics, courses "E-documents accessibility" and "ICT for the handicapped" within university curricula are available.

Access Center Kosice:

Offers course for master students in the specialisation "Biomedical Engineering" at Mechanical Engineering faculty TUKE, where in syllabus

learning materials about assistive technology for blind and visually impaired, for deaf and with hearing impairment, and also for people with motoric impairments is included. In this course is also included practical work with different assistive technology available at the AC TUKE.

<http://www.tuke.sk/AC/indexACeng.html>

The Access Center also teaches course for students from University of Pavel Jozef Šafarik, bachelor study in specialisation "Informatics for disadvantaged people". They have one semester course "Special software" and one semester "Assistive Technology" also with practical work at the AC. Additionally training for social workers is available - about assistive technology, according the materials developed in the frame of European Socrates Grundtvig project ATTRAIN - Assistive Technology Consultant / Advisor Training Development and Delivery.

Spain

No.

I think that everything that could be done to help disabled students to accomplish their studies would be positive.

Question 10

Are there already courses available for the university staff (professors, tutors, etc.) concerning how to prepare scientific documentation accessible also for blind and visually impaired?

- Yes
 No

If yes, please describe the contents of the courses and your experiences with the courses.

If no, do you think that offering courses for the university staff (professors, tutors, etc.) about how to prepare scientific documentation accessible also for blind and visually impaired would be useful and why?

Summary of answers

	Yes	No
Austria – Graz	n.a.	n.a.
Austria – Klagenfurt		X
Austria – Vienna		X

Belgium		X
Czech Republic – Brno	X	
Czech Republic – Olomouc	X	
Czech Republic – Praha		X
Hungary		X
Ireland	X	X
Italy		X
Slovak republic	X	
Spain	X	

Austria – Graz

Not answered.

Austria – Klagenfurt

No.

Yes, because of this the sensibility about the issue will be raised and the understanding will be promoted and study conditions for blind and partially sighted students would be improved.

Austria – Vienna

No.

We are of the opinion that there should exist several dedicated support services in order to ensure the quality of the preparation of study materials/literature and to make it possible to keep and maintain the quality standard of preparation.

Belgium

No.

Yes, it would speed up the process of adaptation if university staff could account for accessibility already during the development of course material. At the moment students with disabilities don't have access to all information sources at hand for able-bodied students.

But due to the extremely small number of students with disabilities in scientific courses, there will be probably almost no change in short term policy.

The OOP project at K.U.Leuven, already mentioned above, will organise in the beginning of 2008 courses for students and staff about how to prepare accessible course materials.

Czech Republic – Brno

Yes

At Masaryk University, 30-50 persons are constantly involved in preparing scientific documentation for the visually impaired, which requires a systematically organized training. The experience varies, due to the fact that the work is exhausting and there is a considerable staff turnover in these services. In other university centres providing more than counselling, there is usually one person in charge.

Czech Republic – Olomouc

Yes.

The Centre organizes regular meetings with university staff. The meetings provide a good opportunity for discussing either common or specific problems concerning university students with special needs studies, the Centre's consultants explain and demonstrate the students with visually impairment needs, highlights for better understanding their everyday life and problematic situations relating to their studies, However, the Centre is not able to offer all types of training courses or specialized meetings for all university staff, concerning every issue.

Czech Republic – Praha

No

We think, that such courses are not imperative, however awareness raising in this field is very important.

Hungary

No.

Courses would be very useful especially for tutors and professors, who could know how to adapt their working methods also for visually Impaired.

Ireland

Yes.

In University College Cork the Disability Support Service has an integrated IT AT(Assistive Technology) Lab within the Library complex. Seminars in how to use JAWS

or make lectures accessible are delivered here and blind students are always involved. Currently we only demonstrate JAWS and Tiger Embosser Book Courier, Braille and speak.

No.

Yes I do. These are the people who understand the materials being worked on by the student and should be the ones who have the skills to help make them accessible. They would of course need the support of the university disability support service. The Computer Science Department in UCC is very interested in developing competencies in these areas as many PhD students are undertaking research in making texts and maths more accessible under the guidance of Dr Ian Pitt, Lecturer in UCC.

Dr Donal Fitzpatrick, a blind computer science lecturer in Dublin City University is also very interested in @science project.

Italy

No.

There are not courses for professors and tutors. They would be helpful in order to have learning resources accessible by visually impaired or to have digital formats which can be easily transformed and adapted.

Slovak Republic

Yes, partially.

Support Centre in Bratislava:

A workshop about the accessibility of web pages and e-documents was prepared for teachers and web providers, that had very positive reaction. In this academic year we are preparing a set of workshops focused on this topic.

Access Center Kosice:

Training also for teachers about assistive technology, accessible materials, teaching of math, and so on is available, using the materials developed in the frame of European project ATTRAIN - Assistive Technology Consultant / Advisor Training Development and Delivery. This training is on demand by teachers. Usually teachers are trained by AC staff according the demand of

teachers (if they have in group student with visual impairment or blind students).

Comenius University Bratislava, report prepared by dr. Elena Mendelová
Technical University Kosice, report prepared by prof. Dusan Simsik

Spain

Yes.

They are courses organized by ONCE for those universities that are interested in forming their professors on visual impairments. They basically consists in giving a general introduction on how a person with serious visual impairments lives and how these persons faces everyday's obstacles. Sessions on Braille, adaptation of material, tiphlo techniques of autonomy are held. In general, all the specific areas of visual impairments are explored.

4 CONCLUSIONS

The analysis of relevant opportunities for university staff to learn about special needs and assistive technology, as well as the comparative presentation of the results in the survey focusing on science accessibility educational activities, lead to some final remarks:

- European universities organize many educational and training activities for students with special needs (e.g. for assistive technologies). These activities are sometimes organized by internal staff, but also many activities are organized in collaboration with associations and already existing special training initiatives;
- devoted initiatives for university staff, in particular for professors and tutors, are seldom organized. Many events and learning opportunities are available and they are suitable also for university staff. In particular conferences, workshops, tutorials, masters. Also online documentation about special education and courses (e.g. guidelines and case studies), developed by recent international projects, can be found and properly used by university professors themselves. Further awareness actions should be undertaken in universities to inform about the existence of this kind of documentation;
- concerning special education on the accessibility problems met by blind and visually impaired students in scientific courses, the results from the questionnaire distributed make evident the lack of well-structured initiatives. In particular, some universities, such as university college of Cork, KFKI in Hungary and Comenius university in Bratislava remarked the importance and usefulness of these courses.