

# **Enable Network of ICT Supported Learning for Disabled People**

## **Deliverable 3.5**

### **ICT to support lifelong learning by disabled people: practical recommendations for good practice**

Workpackage 3: Data Analysis and Evaluation: Principles for the Use of ICT to Support Lifelong Learning by Disabled People and the Future Research Agenda

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## **Recommendations for disabled learners: using technology to improve learning**

### **1. Keep up to date**

Learners should try to keep themselves informed of available technologies and their accessibility features, and new developments in them. They should also be willing to participate in training in using new devices or programs to ensure they use them most effectively.

### **2. Provide educational institution with information about your requirements**

Students should inform their educational institutions of their accessibility and organisational needs as early as possible when starting at a new education institution. They should try to work together with teachers, organisational disability centres and other staff to ensure their needs are met. They may need to be assertive and/or obtain support from student unions and centres for disabled students.

### **3. Report problems and provide feedback**

Disabled students using learning technologies should report any problems and provide feedback to the institution so that these problems can be resolved and the use of technology can be improved.

### **4. Share expertise and make suggestions**

Disabled learners often have expertise on accessibility issues. They should share this expertise with their educational institution to improve the overall accessibility of the learning environment. They should also make recommendations of new devices and programs that can be used to support learning and make it more accessible and enjoyable for (disabled) learners.

### **5. Campaign**

Disabled students may need to campaign, for instance together with student unions or organisations of disabled people, for government to provide better funding to education and/or their institutions to provide more support and better resources to disabled learners.

### **6. Willingness to support technology development**

The development of effective new technologies requires the involvement of disabled learners at all stages. Therefore there is a need for disabled learners to participate in technology development, for instance through advisory committees, working with developers and researchers and through testing and the provision of feedback.

### **7. Working with other learners**

Most disabled learners can benefit from working together with other disabled learners, though some (disabled) learners learn better on their own. They should therefore be ready to provide support, accept help from and exchange information with other disabled students. Doing this at a distance using ICT can be easier for some disabled students than face to face interaction.

**8. Challenging, but realistic objectives**

Disabled learners should set themselves challenging objectives in order to extend their capabilities and achieve the maximum. At the same time they should be realistic and not expect the impossible. They should also take into account their own needs, for instance for regular rest periods and/or to avoid sensory overstimulation.

## **Recommendations for teachers: using technology to support disabled learners**

### **1. Promote equal learning opportunities and inclusion**

Teachers should ensure that all (disabled) students have equal access to the same content and learning materials and experiences. Where possible this should involve the same learning technologies and other approaches as non-disabled students. Teachers need to be aware of the need to ensure that disabled and other minority group students are fully included in the curriculum.

### **2. Flexibility and differentiation of learning**

Teachers should be aware of different approaches and the need for some differentiation of learning approaches to enable all students to maximise their learning outcomes. While there are advantages in all students using the same learning technologies, this will not always be feasible. Teachers should also be aware of factors that may affect (disabled) learners, including their motivation, previous experience and confidence as a learner and disabled person, previous education and external demands.

### **3. Training**

Teachers will require appropriate and regular training in order to keep up to date on available technologies and programs and the most effective ways to use them. Training is also required on accessibility issues, for instance to design accessible documents and web pages. Through teaching unions, teachers should pressure their organisations to provide and pay for access to training in working hours. There are also various free educational web-sites and on-line courses, but these should not be considered a substitute for provision by the educational organisation.

### **4. Appropriate use of technology**

Teachers should be aware of the advantages and disadvantages of different approaches to teaching and learning, as well as particular technologies. They should be able to combine the use of technology with more traditional approaches in appropriate ways in order to best support learning.

### **5. Motivating students**

Teachers should motivate students to increase their confidence and improve their self-perception of their learning abilities, as well as to use new technologies (in appropriate ways). They will also need to support learners in developing the new learning and other skills required to learn effectively with new technologies.

### **6. Use organisational resources**

Teachers should use organisational resources, such as centres supporting disabled students, and expertise in order to obtain information, advice and recommendations about teaching and supporting disabled students, including through the use of assistive and other learning technologies. They should also inform these centres and organisational decision makers about any problems relating to, for instance, accessibility or the use of particular technologies.

### **7. Innovation and creativity**

Teachers should be open to using new technologies, combinations of new and traditional technologies in innovative ways. This could include the use of applications

on mobile technologies and social networking. Online lists and communities, such as the ICT Accessibility in Higher Education Network, may be able to offer useful suggestions.

**8. Make everything accessible**

Teachers should aim to make all aspects of teaching fully accessible to all disabled students. In the case of, for instance, documents or quizzes on a learning management system such as Moodle, this will require that accessibility to the following: the institutional web site, the learning management system and the document, quiz or other application. Teachers generally only have direct control of the accessibility of documents, quizzes and other materials they produce themselves. They should inform the relevant body, such as IT (information technology) support or the disabled students' centre of any accessibility problems with the institutional web site or learning management system. Making documents accessible includes the use of simple clear language and different formats, such as large and standard size print, different fonts and colours, audio and sign language.

**9. Campaigning**

Teachers should campaign, for instance together with their trade unions and student organisations, for the provision of sufficient teaching staff, training, and time for planning their teaching and appropriate resources and support to enable them to fulfil the above recommendations without overworking.

**10. Support and encouragement**

Teachers should support cooperative learning, including discussing and negotiating different approaches to learning. They should provide meaningful and accurate feedback, encourage the meaningful use of existing knowledge and skills and also make learning enjoyable, while recognising that what is 'fun' for some students may be stressful for others.

## **Recommendations for ICT developers: developing effective and inclusive learning technologies**

### **1. Involvement of end-users**

Developers need to understand the requirements, preferences and ways of using technology of different end-user groups in order to develop effective technologies. They should therefore involve end-users, including both disabled learners and teachers, in all stages of the design and development or modification and implementation process of learning technologies from the start. All end-users should be treated with respect.

### **2. Universal design**

Developers should draw on design for all principles to make their technologies usable by as wide as possible range of disabled and non-disabled learners, including learners from different cultures, ages and genders. These principles include the same or equivalent means of use for all users, choice of methods of use, different modes of use to make information perceptible to all, tolerance for error and low physical (and mental) effort. Other important features are options for customisation, compatibility with many different assistive technologies and different interface options.

### **3. Design for flexibility**

Designers should consider flexibility in the way technologies are used, including the ability to transfer solutions between different platforms and use them in different applications and contexts. Increasing interest in learning on mobile devices makes software which can be used on both mobile devices and PCs particularly useful.

### **4. Facilitate learning**

Learning technologies should be designed to facilitate learning, while providing an appropriate level of challenge. This means they should be relatively easy and intuitive to learn to use, but that learning to use them should not be totally trivial, as a degree of challenge can support learning. Flexibility to allow learners to use technologies in different learning situations e.g. on their own, with teacher support, as part of a class or with peer group support is also important.

### **5. Develop users' skills**

Learning technologies should draw on existing skills and should allow learners, teachers and other users to develop their skills as they use the application. Where feasible, they should therefore be designed to cater for the needs of users with different levels of skills, including beginners, experts and various in-between levels. This may involve, for instance, the provision of basic functions at higher menu levels and more advanced functions at lower levels.

### **6. Support and documentation**

Developers should provide clearly written and well organised documentation at least in plain text electronic format. They should also try to provide documentation in a variety of different accessible formats, including plain text of varying sizes and colours, HTML, simplified language, audio and sign language. The provision of other

support, for instance, email help lines is also desirable. Larger developers should also consider providing telephone help lines with a textphone option.

#### **7. Consider ethical issues and standards**

Developers should be aware of and implement all relevant standards and regulations, including the European Standard on Accessibility Requirements for Public Procurement of ICT Products and Services, EN 301 549. Where technologies collect user data, for instance to support user profiles, privacy management systems should be in place to prevent privacy violations and inappropriate data use. Developers should also pay particular attention to health and safety issues and the minimisation of environmental impacts associated with technology development and use.

#### **8. Open source software**

The provision of open source versions of software for both mobile and fixed devices will increase the number of users. It will also provide them with increased flexibility by allowing them to tailor the software to meet their own needs or to be used in particular applications. But the provision of an open source (or other free) version does not prevent the development of commercial software with additional facilities and/or support. Where developers do not provide an open source version, then they should at least provide a trial version available for about 30 days to allow potential users to test the software.

#### **9. Versions in different languages**

The provision of versions in several different languages will significantly increase the number and diversity of potential users. This should include versions in languages with relatively few speakers.

#### **10. Contextual Features**

Developers should consider the context of the main groups of target users which should include factors such as educational background, motivation and self-perception of learners; individual learning or learning in educational organisations; and the availability of national and local support mechanisms.

#### **11. Accessibility of audio and visual elements**

Learning technologies should provide a built-in screenreader with auditory access to the whole interface. Various options should be offered such as: options for reduced graphics versions of text, choice of visual representations of sounds, e.g. sound visualisation and sound balloons, choice of high contrast modes, choice of verbatim or summary closed subtitles (captions) for all dialogue and important sound effects, choice of summary or detailed audio description for graphics and rich media and separate volume controls for music and sound effects.

#### **12. Customisation**

Users should have the control over the information in the profile. They should have options to turn a wide range of features on or off, speed options for all functions, a wide range of difficulty levels and different formats for feedback and other information.

## **Recommendations for educational institutions: supporting disabled students including through technology provision**

### **1. Policy**

All educational institutions should have policies on the inclusion of and equality issues for disabled learners. These policies should take account of the diversity of disabled learners and the fact that they may be members of other minority groups. They should include equal access to all parts of the curriculum, the accessibility of all learning materials and the availability of assistive technology including all institutional computers. Institutional policies should cover disabled staff as well as students.

### **2. Centre for supporting disabled students**

All educational institutions should have a centre for supporting disabled students. The centre should have highly trained staff who are able to provide advice and support to teachers and departments. It should also have the resources to, for instance, produce Braille versions of documents and tactile diagrams, and to assess the accessibility and other requirements of students in consultation with them.

### **3. Commitment, not tokenism**

Educational institutions need to demonstrate a serious commitment to equality and support for disabled students, including through technology provision, not just tokenism. This should include a committed champion at a senior institutional level and measures to regularly monitor the implementation of policies and the associated outcomes and to make changes if the policies or their implementation do not achieve the desired results.

### **4. Consultation and involvement**

Educational institutions need to regularly consult with organisations of disabled learners and staff, as well as organisations of disabled people, on their learning support needs. This includes the need for assistive and other learning technologies.

### **5. Employment of disabled staff**

Educational institutions should employ significant numbers of disabled staff preferably close to the 15.7 per cent of the European population estimated by the EUROST data collection organisation to be disabled or have a long-term health condition. This will help to 'normalise disability', provide role models for disabled students and show that disabled people can have careers.

### **6. Training**

Educational institutions should provide training for all staff on disability equality and disability etiquette, and training for teachers and other relevant staff on pedagogical issues related to teaching disabled students and the use of assistive and learning technologies. All training should be paid for by the institution and provided during working time with teachers and other staff not required to make up work afterwards.

### **7. Appropriate use of standards and checklists**

Institutions should be aware of relevant national and international standards and regulations, including the European Standard on Accessibility Requirements for

Public Procurement of ICT Products and Services, EN 301 549, and ensure they implement them. However, such standards and regulations should be considered a minimum and institutions should aim to go beyond the standards and regulations and implement additional measures. Checklists can be used to support policy implementation, but involvement of disabled learners and teachers is also required.

**8. Social as well as educational integration**

Institutions should develop and monitor the implementation of policies and measures to ensure social as well as educational integration of disabled learners. This should include, for instance, quiet rooms for autistic and other disabled students who find social interaction tiring, as well as appropriate support for internet-based social interaction.

**9. Inclusiveness**

Institutions should develop a culture of inclusiveness promoting the involvement of disabled learners and recognising their expertise.