AEsseDI: a tool for supporting the design of accessible learning plans

V. Benigno, V. Candiani, G. Caruso, M. Tavella

Istituto per le Tecnologie Didattiche - Consiglio Nazionale delle Ricerche, via De Marini, 6, Genova 16149, Italy

In this paper is presented an educational web-based environment called AEsseDI, produced in the framework of the project established by Italy’s Ministry of Education called New Technologies and Disability. In the field of education, accessibility issue, related to the use of multimedia material could create new barriers for the integration of disabled students or students from other disadvantages groups. Therefore, it’s absolutely necessary to develop a new approach where the questions are faced both by a technological and a methodological point of view. The structured environment AEsseDI, designed in compliance with the Universal Approach and in conformance to WCAG 1.0, is devoted to the construction and retrieval of accessible and usable structured learning plans focused on the classroom inclusion of students with disabilities. It’s an example of a comprehensive approach to teaching, enables the successful inclusion of all students, including the disabled, in education classrooms.

Keywords: learning plan, eAccessibility, web-based environment

1. Introduction

Information and communication technologies are supposed to help disadvantaged people to develop a satisfactory life from the social, professional and relational points of view. One significative example is provided by the sector of rehabilitation and assistive technology. However, assistive technology does not remove all access barriers in educational context. “Technology could eventually lead to new forms of discrimination, if part of the population is not able to access it”1.

This is especially true for the use of the Internet, which has become an indispensable and widely used tool in many different fields. It should be noted that problems of accessibility are especially serious for persons with disabilities, but can also arise in specific environmental or social situations. The subject of e-Accessibility is therefore relevant for the integration of all users in the Information Society.

Access to information is a basic right and increasing amount of publicly available information is even more important for people with disabilities and other groups at risk of exclusion [3].

In many European and non-European countries specific laws have recently been introduced which stipulate that ALL educational ICT tools destined for classroom use must comply with accessibility standards in force. A number of standards and guidelines have been proposed for the web accessibility and the Design for All (DfA). In spite, a diffused interest and proliferation of debates, on the problem of accessibility, the suggested solutions have encountered so far scarce consensus and diffusion. A number of research works, for example, demonstrate that public institutions are extremely slow in upgrading their web sites according to present-day standards [2,4,5]. It seems difficult that this problem can be solved by means of technical and legislative proposals alone.

---


© FORMATEX 2006
2. The AEsseDI project

The question of the accessibility is of particular concern in the field of education, where teachers and all those involved in education are becoming increasingly aware of the fact that all students should be provided with equal opportunities for accessing all kinds of educational resources, including those that are ICT based [6].

The ITD, in the context of the research project "New technologies and disabilities" of the Italian Ministry of University and Research (MIUR)², is currently studying the problem of Accessibility in relation to Educational Software (called AEsseDi), with special reference to the application of law n.4, 9/1/2004 (the so-called Stanca law, from the name of the Minister who proposed it).

The AesseDI project³ has the following purposes:

- to study possible solutions to the problem of making educational software accessible [1];
- to develop a web-based environment, in order to deal simultaneously with instrumental and methodological aspects, with the aim of stimulating a discussion among teachers on how to solve the problems of accessibility, with special attention to educational software.

The structured environment AEsseDI, is devoted to the construction and retrieval of structured teaching units focused on the classroom inclusion of students with disabilities. AEsseDI was primarily conceived to support teachers in the process of designing, producing and making available teaching units, using ICT tools, to the general public and other educators, but it can also be used by educators to view, comment on, modify and re-use existing plans.

3. AEsseDI design: Universal Design Approach and Accessibility Standards

AEsseDI was designed in compliance with the “Universal Design ” approach⁴, that is it was conceived according to the principle that products, services and environments (including ICT based ones) need to be usable by as many people as possible, regardless of age, ability or situation.

Universal design can be distinguished from meeting accessibility standards in the way that the accessible features have been integrated into the overall design. The Web-Based environment AEsseDI was designed conforming to WCAG 1.0[7] and the Italians Ministerial Guide Lines, according to standard XHTML 1.0.

AEsseDI environment was designed using CSS, that allows and make easier the access to the content by textual browser. For example, the graphic page style of AEsseDI environment can be modified, disabling the CSS, into an only text one that shows a clear and easy accessible structure for a textual browser.

The environment was designed to optimize the accessibility and the usability to users with special needs, simplifying:

- the content or document transformation according to the browser behaviour or to the user rules;
- the information access making an easier to use graphic interface;
- the navigation developing a coherent pages organization.

4. The main features of the web-based AEsseDI Environment


³ Info about the project available at http://asd.itd.cnr.it (accessed September 2006)

The web-based AEsseDI environment mission is to host accessible educational paths realized by teacher of any level school with class group, in a full inclusion logic of the student with special needs. Every teaching unit is a sort of itinerary made up of a number of different “educational activities”. These represent the different phases of the educational plan; each activity can be both independent of or related to other activities. Each unit provides specific information on the accessibility features of the software products adopted and details the problems encountered during the learning process by students with disabilities. The environments Web-Based AEsseDI is divided in two areas: the working area and the viewing area, and it’s possible access to it as an author and as user. As an author you have the possibility to build and publish your learning plans as well as you have the possibility to modify the existing plans, (of course each author can only modify own plan); as a user you have the possibility to navigate all over the system, exploring the entire amount of teaching/learning plans.

3.1 The structure of learning plans

While producing learning plans, teachers follow a suggested structure which brings accessibility related issues to the fore; the system requires a detailed description of possible problems and suitable solutions to adopt in order to fully guarantee the inclusion of students with disabilities in activities designed to reach the educational objectives at hand. The design of the project follows two parallel and independent pathways: a general one that includes guidelines on the teaching modalities, and a more detailed one that describes the specific activities (Fig. 1).

![Fig. 1 General and specific section of the teaching pathway](Image)
General Section
In the general section (Fig. 1), the information related to the teaching area, the school level and the degree of disability are mandatory, in that, they represent the variables among which an external user can perform the web-based AEseDI search.

In addition, a brief description of the most important aspects of the teaching pathway is required. With regard on the general phase of the pathway, the inclusion of information on the areas termed idea, objectives, contents, organization, focus on integration and experience on the pathway are allowed. In the above-cited areas, the teacher is asked to simply describe the general indication of the entire pathway.

Only organization area is subdivided into three sub-areas called the methodology, related to the educational method used, the tools adopted, the time needed to perform all the activities of the plan

The web-based AEseDI is designed to provide visibility to the activity of the teacher towards the students with special needs. For this reason, a specific area termed focus on integration exists, in which the technologic and methodological tools are included to facilitate the integration of the student with difficulties in the classroom, based on the teaching pathway.

Finally, the specific area dedicated to the Experience is of greatest importance, because it is “filled” by the teacher at the end of the teaching pathway. In this area, the teacher is asked to describe the process related to the achievement of the teaching pathways, allowing for the positive and negative aspects to rise.

Specific Section
The pathway is a group of activities whose contents and sequence need to be described. The single activity of the learning pathway can be principal or personalized:

- **principal** if it is usable by all students, included students with special needs;
- **personalized** if it is developed specifically for students with difficulties.

Despite the fact that the purpose of the AEseDI repository is the inclusion of the learning processes, which are designed to be employed by everyone, it is important to emphasize that, in difficult contexts, some activities need to be differentiate, with the objective to reinforce them. This allows each student to participate to the same teaching pathway with motivation and in an individualized modality.

Figure 1 shows an example where we can see a physics learning path developed for high school students. The path activities, which are represented with different symbols, show two activities with the same title; one of these is for all the students (circle symbol) while the other is specific for the disabled students (the bus stop symbol) in order to reinforce the educational goal.

For each activity (Fig. 2) the teacher is asked to describe in details the performance of the different phases, highlighting the relevant aspects. First of all, the teaching learning goals of the activity have to be indicated.

In the tools and resources section the specific sources that are needed for the activity must be listed, by specifying the required amount, where necessary. In the educational method section, all information regarding on teaching methodology, work organization, adopted teaching strategy, the length of time required for the design and the performance, and the potential products are to be reported.

With regard on the issue of accessibility tools, two items are reported:

- usability/individualization of the activity of the student with special needs: in this area, all the methodological and organization tools are described, thus facilitating the integration of the student to perform his/her activity.
- software accessibility: in this area all the suggestions for software use have are reported. In particular the teacher is asked to describe all modifications or adaptations to the educational software in relation to its use by students with special needs.

In the area related to the documentation and evaluation it is suggested that all the tools and the criteria employed to document and evaluate each activity are reported. Each teacher/author is invited to report not only the indication but the used tools.
Finally, for each activity it is required that what has happened during the performance of the activity is reported in an informal way. The teacher is invited to indicate in the experience section the methods and suggestions that usually are not described in descriptive repository of teaching experiences.

5. Conclusion

AESSedi offers a panorama of different examples of how accessibility issues can be effectively solved in real classroom contexts. It also can be viewed as an environment exploiting the potentialities of the Internet to address educators’ attention to accessibility related themes. In addition, AESSedi can also be considered as an example of an educational site designed to provide Universal Access. The central idea, around which the web-based environment has been built, is the following: in order to develop a new approach to accessibility in the educational context, it is necessary that teachers themselves face the problem, find solutions, suggest them, implement and improve them. The AESSedi environment is meant to become a good example of how ICT and multimedia tools, such as educational software, don not create new barriers for the integration of students with special needs or student from other disadvantaged groups.

References