“Ada Web Portal”: Promoting Women Access to Informatics

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The gender gap in Computer Science education is becoming an issue. The number of women enrolling in bachelor programs on IT subjects in Italian Universities has dramatically decreased by about 30% on the last three years. Nowadays, only 15% of Computer Science students are female, while the overall percentage of Italian females enrolled at Universities is about 55%. The Ada Web Portal we present in this paper is the first action of a larger project called *ADA – Promoting Women Access to Computer Science.* The aim of this web portal is to facilitate communication and to share experiences between young women, teachers and women who are professionals working in ICT, both at University and elsewhere. It extends the concept of web site beyond the specific target of women students to reach and coordinate interaction among teachers, female professors, female researchers and women who play key roles in ITC Research and Development.

Keywords

Gender gap and ICT, Online resources and instruments, Tools for promoting IT to young women, Web site, Women and Computer Science

1. Introduction

Not only men still largely outnumber women in IT education, but the gender gap dramatically increased in the last few years.

The gender issue in Computer Science is not only an Italian problem. There are many actions and projects all over the World promoting women access to ICT, in particular from the educational perspective. To provide some examples, meaningful research papers have been produced from researches and surveys (see reference [1] and [3]).

The creation of the Ada Web Portal (**http://www.dsi.unive.it/ADA**) is part of a larger project called “ADA – Promoting Women Access to Computer Science”, promoted by 34 Computer Science Departments in Italy, in partnerships with prominent industrial associations such as Assolombarda and Confindustria Veneto. The project aims at implementing a suite of actions to enhance women participation in IT, and create job opportunities that fit with the familiar side of the women’s life. The targets of the project are female students in high schools, in particular students attending the final two years of high schools. Also teachers are involved, as actors designing guidelines and tools for educational orienteering. The team members will manage activities for the project locally. This way, the Ada Project is spreading action throughout Italy.

2. Women and Computer Science in Italy

The creation of the Ada Web Portal originated from the analytical studies of the IT gender gap in Italy. The researchers focussed on women and information technology at various levels, exploring the different paradigms of accessing technology. This included activities in IT for women attending university courses, performing academic research and teaching, as well as studies of women at work in ICT's. The findings of this research represent the raw material for the creation of the ADA web portal.

Fewer women are enrolling in computer science nationwide. There are very few women also operating as ICT researchers, professor and ICT Professionals. We report some data of the Italian situation about these three categories.

2.1 Women as students

- The number of female students who enrolled in Computer Science bachelor courses in Italy has steadily declined from 1059 in 2003/2004 to 754 in 2006/2007. There is a remarkable difference between the number of men and women enrolling in Computer Science during the last four years:

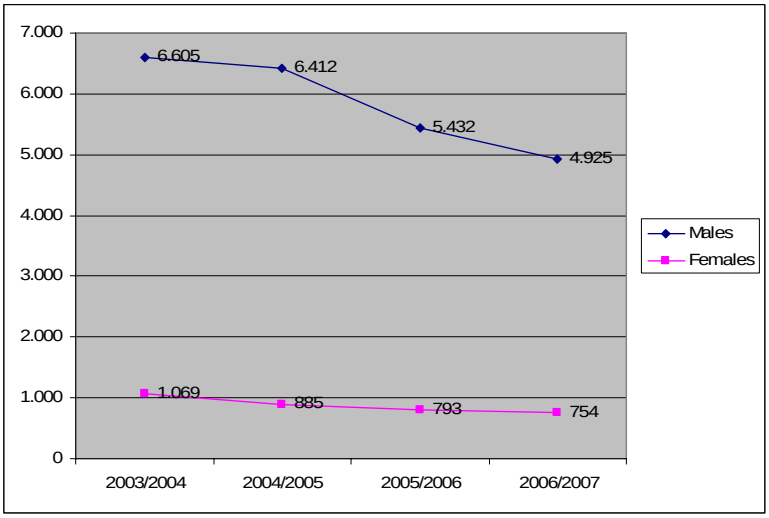

Figure 1 Comparison between men and women enrolling in Computer Science in the last four years

- A select sample of the university system data reveals that female students account for only 15,3 % of the IT student body, in comparison to 54,5% of the overall percentage of female students in Italian University

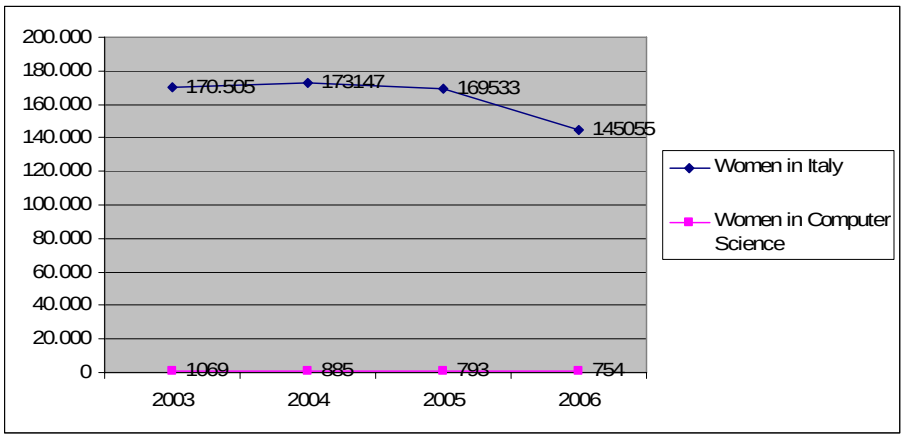

Figure 2: Comparison between women students in Italian Universities and Computer Science women students.

2.1 Women as researchers

The percentage of women in ICT academic research and education in Italy holds steady from 2000 to 2006 and stands at 26 percent.

The number of women is higher at the lowest level of the academic career. During the last six years the teaching body of Computer Science has been increasing from 483 to 774 teachers nationwide. Women are more represented as researchers or associate professors, rather than as full professor. The percentage of women in a role of full professors stand at 5,6% among the overall academic teaching staff in 2006 (Vs men at 23%), while women researchers stands at 10% .

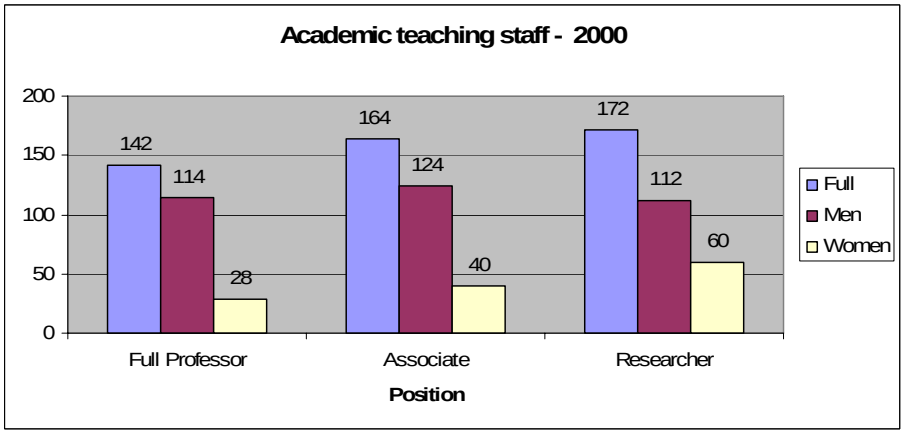

Figure 3: Academic Teaching staff and roles in 2000

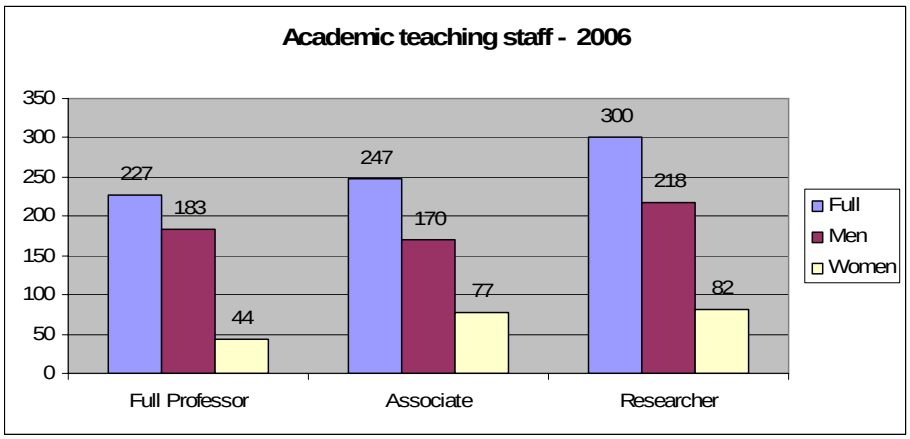

Figure 4: Academic Teaching staff and evolution of roles in 2006

2.1 Women as ICT Professionals

Women are still a minority group among the professional workers in the ICT sectors. In 2003, the number of women professionals in ICT fields in Italy reached 35%, up from 33% in 2001.

Women's under representation in the entire Italian labour market is a well-known issue.. In 2003 the employment rate for Italian women stood at 38%, one of the lowest among Europe.

Despite the predominance of men professional, in the last few years research papers and statistics offer surprising data: the presence of women in ICT professions between 1997 and 2001 in Italy overcame European average of women workers in ICT.

	1997			2001		
	women	men	% women	women	men	% women
Italy	39,4	82,1	32	67,3	135,5	33
UE 15	279,9	727,1	28	531,5	1387,3	28

Source: Eurostat on data of Labour Force Survey, in Ponzellini (2006), p. 40

Table 1. Changes in men's and women's employment, European labour market in ICT sectors, 1997-2001 (in thousands).

Some findings of our survey about women and ICT jobs are surprising. The proportion of women is significantly higher among IT professionals, though **i**t is widely agreed that women have traditionally been much less likely than men to participate in computer science, technology and engineering subjects in schools and colleges.

The reason why there are so many women as ICT professional could be found in the peculiar features of the new job categories related to ICT. Women are attracted by dynamism and flexibility granted from ICT professions, which are structured in:

- Teamwork
- Working on projects
- Working with customers
- Networking and web communities

Women working in the ICT sectors know that they are accessing a new field in which they can find new opportunities for better integration between the professional and the domestic side of life. They also know that this is a chance to access a world where people have to display and use their own know-how, which is the real value and richness of a worker.

3. The Ada Web Portal

The Ada Web Portal has been developed to facilitate communication and sharing of experience between female students, teachers and women working in ICT, both in academic and in other fields. It serves as a "bridge" between high schools, colleges and the workplace in the world of Women and Computer Science. It extends the concept of web site beyond the specific target of female students and reaches out to female teachers and professors, researchers and women who play key roles in ITC Research and Development. It is a tool for young female students who are approaching university, helping and guiding them in making the choice for their future careers. It also provides a collection of resources, articles and documents useful to teachers and women who work in IT. The ADA Portal has been developed to address the needs of different roles in the landscape of Women in Computer Science. Therefore, the Ada Web Portal becomes a resource of information and a channel for discussion between young female students, teachers and women in ICT's. Forum, Newsletter, F.A.Q. are some of the tools to promote interaction and communication between the various players in the world of IT's.

The site promotes the sharing of experiences and *Best Practices*, providing role models to female students, encouraging them to access IT courses and careers at University. In fact, the first "computer leaders" were women. Ada Byron Lovelace was the first programmer in History, Grace Murray Hopper created the COBOL language, and six clever women programmed the Eniac, the first large-scale, electronic, digital computer during War World II. Women contributed to the evolution of Computer Science in many different ways. In the Ada Web Portal we want to acknowledge the key role they played in the past. Nowadays, their stories are crucial as role models for all those girls and women that would like to access the field of Computer Science with more self-confidence. Not only the Ada Web Portal offers a series of historical profiles of female pioneers in Computer Science; it also offers interviews with women majored in Computer Science who are now working as project managers, programmers, product specialists or software analysts in IT. Finally, the Ada Web Portal wants to introduce a new perspective in Computer Science, investigating it from the point of view of all the women that every day provides their contribution to the evolution of the field. Ada is also a tool to keep track of official documents, articles, interviews and findings of all the researches made within the more general ADA Project.

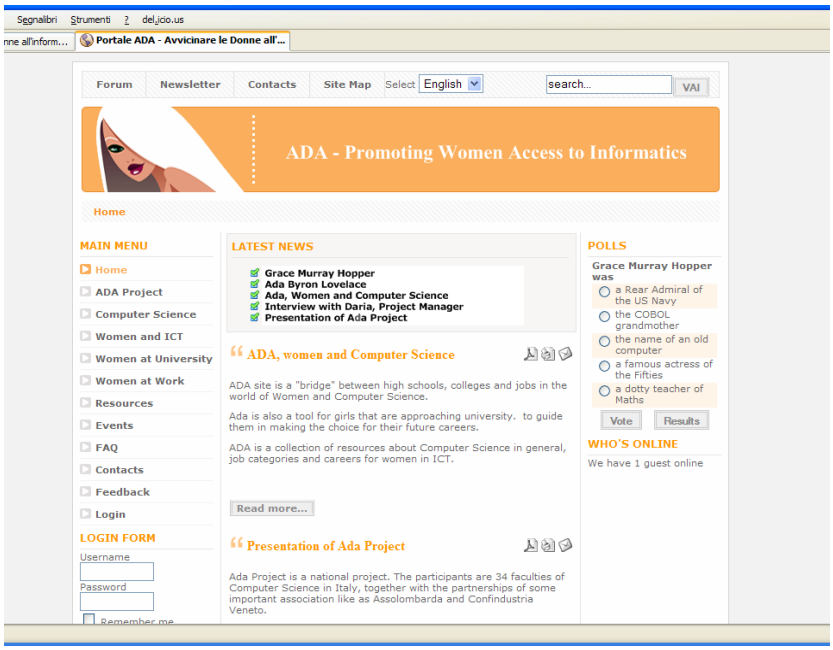

Figure 5: The Home Page of the Ada Web Portal (***http://www.dsi.unive.it/ADA***)

3.1 Ada Web Portal Key Features

To our knowledge there are no other web portals covering the subject of Women in Computer Science, providing both a wide-spectrum collection of information and a discussion and interaction plaza. The main features of the portal are summarized as follows:

- An historic research section, with a collection of historical profiles of the first female IT pioneers.
- Two sections dedicated to statistics and reviews of demographic data regarding women in Italian Universities, in the roles of both students and researchers.
- Success stories: interviews with female professionals. In this section, women tell their stories, talking about their past experience at the university and their present occupation in the field. They provide a meaningful medium to encourage young females in choosing Computer Science as a career.
- An overview of Computer Science degrees in Italy providing guidance to students with information and insights on choosing the most suited faculty, based on their requirements and expectations.
- A section of *Resources* providing a selection of links to national and international projects promoting women access to Computer Science and an anthology of articles, documents and conference proceedings regarding Gender Gap and Gender Issues in ICT. It also features a section named *Events* which provides information about conferences, important academic events and meetings related to women in Computer Sciences.
- A large section of interactive contents, including Forum, F.A.Q., Newsletter, Posted Questions and answers and a space where young females and women can interact and communicate with experts.
- The web site design attempt to create an appealing environment to high-schools students in order to encourage them to interact through it.

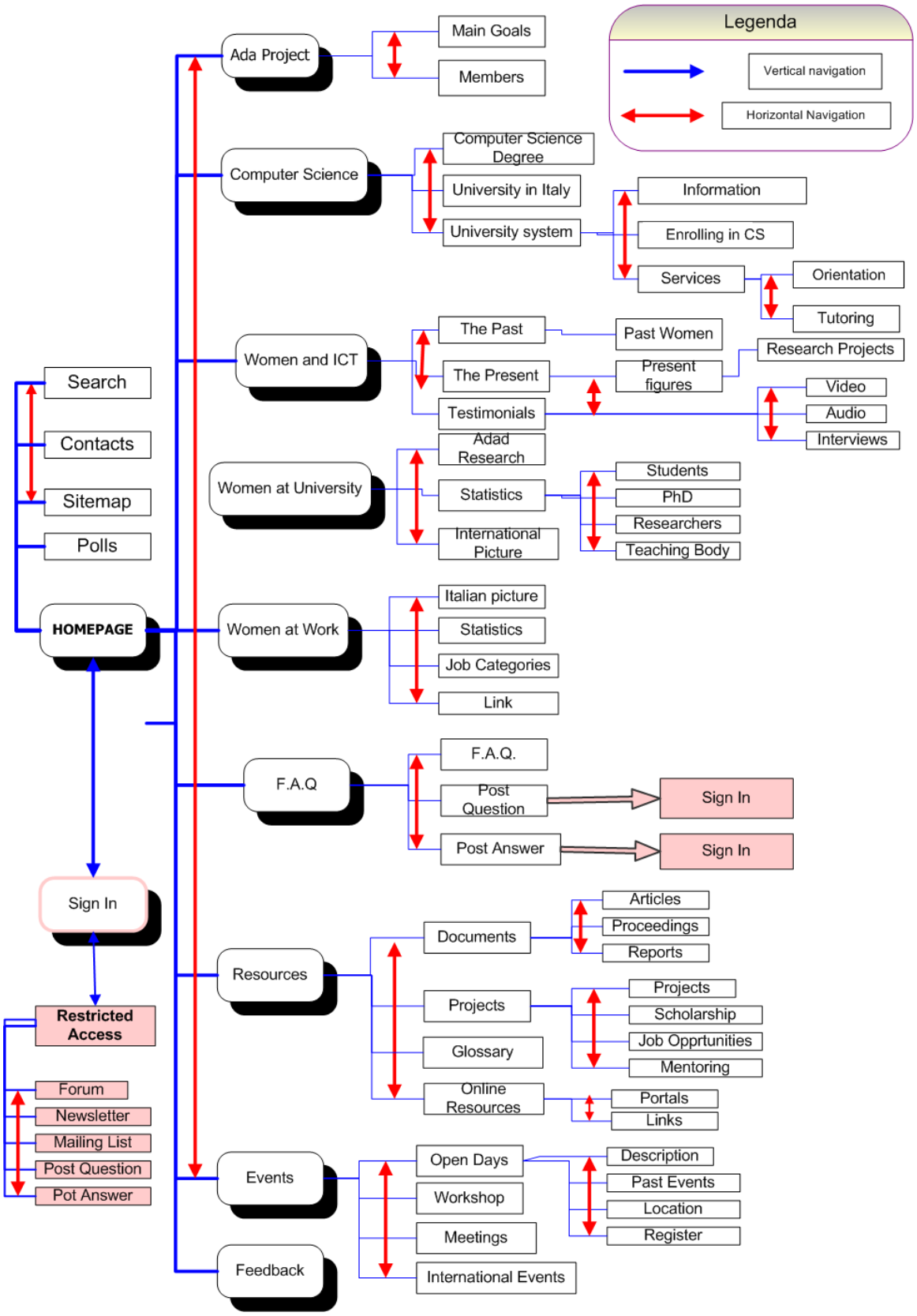

Figure 6: Ada Portal structure and navigation hierarchy

4. Other projects (Worlwide Resources)

The Ada Web Portal took form after a detailed analysis performed on other similar projects Worldwide. The most relevant are Computergirl.us, Technedonne Portal and Women@SCS.

4.1 Computergirl (http://www.computergirl.us)

Computergirl is a website created by a team of female students as they were high schools students. The project has become an Association for Computing Machinery's Committee on Women in Computing (ACM-W) project.

The mission is described as follows: “encourage high school girls' interest in Computer Science; address question and concerns; provide a window from experts and role models to students; share resources”.

Computergirl inspired our choice in selecting the type of resources of the Ada Web Portal. It also showed us the relevance of collecting interviews with testimonials, in order to build up a sort of gallery of role models for young women accessing Computer Science.

4.2 Technèdonne (http://www.technedonne.it)

TechnéDonne is a project financed by the EU Equal Programme. It aims at fighting the professional segregation of women in the field of the new Communication and Information Technologies (ICT), trying to find innovative strategies to cope with the gender digital divide. The project aims at offering the necessary resources through a website to grant equal opportunities for both women and men in the field of ICT, trying at the same time to remove the obstacles which are socially constructed.

The Technèdonne Website provides a large number of articles, documents, research papers and other resources about the relationship between women and New Technologies. It has been a rich source of information for the Ada Web Portal. Thanks to the experience of Technèdonne, we find out that women and girls have to get involved in concrete initiatives to reach self-confidence in the use of ICT. We could use their experiences to organize Ada Projects initiatives with more awareness of the real needs of women in this field.

4.3 Women@SCS (http://women.cs.cmu.edu/)

Women@SCS is a community of women attending the School of Computer Science (SCS) at Carnegie Mellon University, Pittsburgh (USA). The Women@SCS mission is to create, encourage, and support academic, social, and professional opportunities for women in computer science as well as promoting the breadth of the field and its diverse community. The Women@SCS Advisory Committee consists of undergraduate students, graduate students, and faculty within the School of Computer Science.

Members of the Committee have initiated many programs, such as the Big/Little Sister program for undergraduates, the invited Speaker Series for graduates, as well as dinners

and other social and academic events. Women@SCS also sponsors outreach projects such as "Is there a robot in your future?" workshop for middle school girls, and the Women@SCS Outreach Roadshow with its different versions for undergraduates, for grade school children, teachers, and parents.

The Committee was born in 1999 and it is still active, giving help to the new entries in computer science and promoting a healthy and supportive community atmosphere. The analysis on the activities of Women@SCS represents a practical guide for building a student organization within the Ada Project and designing activities and events that can encourage and support a community of women in computer science.

5. Conclusion

This section presents activities and results of the work of the Ada Web Portal. This is addressed by answering three fundamental questions:

1. How are female students motivated to visit the portal and engaged in its various activities?

2. What is the impact and the results of the ADA Portal work so far?

3. How is its impact going to be measured?

The students will be motivated to visit the Ada Portal and engaged in its different activities through a series of actions described as follows:

- Promotional actions using e-mail and newsletters campaigns directed to high school teachers. The target teachers are the one involved in multimedia projects such as the creation of the school's web site. We provide information about the Ada Portal, request their feedback and opinions. We also encourage them to provide links to the Ada Portal in their web site Link Sections.

- Reviews and spreading of information about the Ada Portal in a network of web sites covering women and the new technology offering national circulation.

- Links to the Ada Web Portal from a number of University Web Sites cooperating with University Ca' Foscari of Venice

- Organization of events and meetings: this includes the presentation of Ca' Foscari Faculty of Computer Science to high schools, as well as the planning of a series of Open House days with practical session.

At the current date, the ADA Portal promotion and media information activities have yield the following results:

- A few partnerships with high shools have been already established in order to put into action orientation activities with female students.

- The Ada Portal has an average of 20 visitors a day. It is worth nothing that half of the users get to the Ada Web Portal using web search tools.

- Several university students showed their interest in the website and its contents. They asked for our help in order to get more documentation about the history of women in Information Technology. Graduate students in Computer Science at University of Naples Federico II already quoted resources from Ada web Portal in their dissertation.

- An interview on the acitivities of the Ada Project and the Portal have been published online at **http://www.dols.net**, an Italian website on women and New Technologies

The ADA portal impact (o relevance) on the Italian IT community will be monitored through the following means: Web Statistics, upgrading of the research section with annual data on the participation of women in ICT, analysis and registration of the most significant forum topics, registration of keywords used with search engines to retrieve the web site.

Ada project is only a tool to spread the relevance of the gender issue in Computer Science Education, both in Italy and across the World. IEE II 2007 represents a great opportunity to promote the Ada Web Portal and strengthening our programs aimed at attracting and retaining women students in Computer Science.

References

1 *A Study on the Status of Women Faculty in Science at MIT*, The MIT Faculty Newsletter, Vol. XI No. 4, March 1999, http://web.mit.edu/fnl/women/Fnlwomen.htm
2 A. M. PONZELLINI (2006), a cura di, *Quando si lavora con le tecnologie,* Edizioni Lavoro, Roma.
3 ALMALAUREA, http://www.almalaurea.it
4 CNEL, *La Trasformazione Silenziosa – Donne, ICT, Innovazione,* 2004, http://www.cnel.it
5 COMMISSIONE DIDATTICA DEL GRIN, *Analisi della situazione delle classi di Scienze e Tecnologie Informatiche,* 9 Febbraio 2007.
6 UNIVERSITA' CA' FOSCARI, Information Technology and Teleccommunication Service Center, Data on Computer Science students from 1992 up to 2007.
7 ISTAT (2001), Donne all'università, Il Mulino, Bologna
8 ISTAT (2006), Università e Lavoro, Orientarsi con la statistica, http://www.istat.it
9 Ministero dell'Università e della Ricerca, http://www.miur.it
10 Technè Donne Project at http://www.technedonne.it/
11 Widening Women Work in Information and Communication Technology, http://www.ftu.namur.org/www.ict
12 Women@SCS project of the School Of Computer Science at Carnegie Mellon University http://women.cs.cmu.edu/