THE 1ST GIRLS’ DAY AT THE UNIVERSITY OF ZARAGOZA (SPAIN)

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ABSTRACT
This paper presents an outreach activity, called Girls’ Day, organized at the University of Zaragoza, for the first time in Spain. The event’s aim is to encourage female students’ of final years of high school (15-16 years) to consider engineering studies. The activity involves visits to research laboratories and to stands of selected companies belonging to technological, scientific and industrial sectors. The presentation and demonstration of the different works were always performed by female engineers. The event has been very well evaluated by the students, and had a positive impact on improving their view of engineering.

Key Words: engineering studies, education, gender issues, outreach activities.

1. Introduction

The promotion of early positive experiences with science and technology is recognized as important for increasing participation in these fields [1]. Early positive experiences have the potential to instil confidence and values, as well as to influence career decisions [2].

From this perspective, increasing the recruitment of female students in the engineering areas is crucial [3].

In Spain, only 13.8% of all women chose University studies in the technological and engineering areas in 2000/01. Presently, in 2007/08, that percentage has risen to a mere 14.3%. As far as female presence in these studies is concerned, the figures reveal a certain level of stagnation. In 2000/01 women made up 26.82% of engineering students, while in 07/08 they made up 27.27% [4]. Although there has been a slight increase, it has mostly been confined to specializations such as Chemical Engineering or Industrial Design, where female presence has been traditionally higher, whereas in those studies related to Computer Science, female presence has not only not improved but has even experimented a considerable decline in recent years. These figures underscore the urgency to encourage women to further their professional careers in technological disciplines.

Of course, attracting women to the engineering field is no simple task, considering that research has shown that females have a more negative attitude towards information technology (IT) than males [5]. Although no simple solutions are available, a partial solution is to increase the awareness of female high school pupils, first regarding the very existence of the field, and secondly of its nature [6].

With all this in mind and following other international examples [7, 8], an outreach activity called Girls’ Day (see Figure 1) was specifically planned at the University of Zaragoza to encourage high school females to consider taking up engineering studies.

![Figure 1. University of Zaragoza Girls’ Day logo](image-url)
2. The development of the event

Girls’ Day is a one-day event aimed at introducing female students to science, technology and research [9]. The activity, implemented on November 11th 2008, was led by women holding relevant positions in either research or business. The activity involved 13 high schools, 10 research laboratories and 7 selected companies. It was the first time such an activity was staged in Spain and 550 students attended the event.

The day was designed to:

1. increase awareness of the different opportunities available in the engineering and technology fields,
2. present positive role-models to young high-school students and
3. provide positive experiences of contact with research and innovation

The activity was focused toward students in their final years of high school (15-16 years old), just before they have to choose the first option that will lead them to different areas. Although the event was attended by both female and male students, it was specially designed to encourage women to consider studying and becoming involved in the engineering field. This activity aroused much interest amongst educational centers, many of which requested to be included in the experience. Finally, and in order to guarantee a representative sample with a manageable size, 13 high schools were selected (amounting to a total of 550 participants): 7 of these are urban and 6 are rural\(^1\), most of which are public and only 3 semi-public\(^2\).

Table I shows the complete Girls’ day agenda.

Parallel activities were planned for each group of students throughout the day. For each group the Girls’ Day experience lasted 2-3 hours, during which they were taken to visit stands set up by the participating corporations and to two research laboratories as well. The companies offered the possibility to observe and experience different technologies (for example induction-heated home appliances). Visits to research laboratories were designed as interactive sessions geared specially toward active participation. Figure 2 shows girls visiting one of the companies’ stands while Figure 3 shows a group of students during one of the laboratory sessions. Special attention was given in every case to show research applications with a positive social impact.

<table>
<thead>
<tr>
<th>Hour</th>
<th>Topic</th>
</tr>
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<tbody>
<tr>
<td>8’30–13’00</td>
<td>Parallel activities: guided tours of research laboratories and company stands (focusing on student groups)</td>
</tr>
<tr>
<td>13’00–14’00</td>
<td>Official Ceremony geared toward teachers and media</td>
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<tr>
<td>14’00</td>
<td>Lunch</td>
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<tr>
<td>15’00–18’00</td>
<td>Parallel activities guided tours of research laboratories and company stands (focusing on student groups)</td>
</tr>
<tr>
<td>18’00</td>
<td>Plenary Talk: <em>Sex and Gender in Engineering</em></td>
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<tr>
<td></td>
<td>Lecturer: Eulalia Pérez Sedeño (CSIC)</td>
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</tbody>
</table>

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\(^1\) Rural areas have been defined as all possible locations with inhabitants < 100,000.

\(^2\) In Spain there are public and formerly private-religious (mainly Catholic) institutions where students in compulsory levels are almost fully state subsidized.
After participation in Girls’ Day, another questionnaire was handed out to all the students in order to evaluate not only their opinion on the experience but also the impact of the activity in improving their knowledge, perception and motivation towards taking up the engineering profession.

Both questionnaires were the foundation of the study developed and presented in other work [10].

3. Impact of the Girls’ Day

The attendance at the event had a very positive impact in the high school students. The interest in pursuing a degree in engineering has been slightly increased by Girls’ Day and their view of the engineering profession was also improved.

Figure 4 presents a direct evaluation by the attendants of Girls’ Day’s usefulness in relation to the intention of pursuing engineering studies.

The low average level of agreement with the point about the motivation to study engineering (especially in the case of women) and with the statement “The outreach activity has led me to reconsider my choice of studies” is an indication of the need to lower the age of future attendants.

A preliminary survey was also carried out among students in order to collect information about their interests, opinions, perception of engineering and engineers, etc.

Seven companies belonging to technological, scientific and industrial sectors and selected from amongst the 30 companies that showed interest took part in this first call. Most of them set up demonstrative stands on the campus, but several of them offered to organize guided tours of their own establishments as well. Ten research laboratories from the university and research institutes also participated in the event. In both companies and labs, students performed encouraging activities specially designed for their age group, and the presentation and demonstration of the different works were always performed by female engineers. More than thirty volunteers, all of whom were female students of the higher courses of engineering or engineering postgraduates, cooperated with the event acting as guides for the different groups during the visits.

Before attending the event, an informative talk was given at all participating educational centers. Informative material for parents, teachers and students was distributed in order to explain the point of view and purpose of Girls’ Day as well as the importance of taking part in the experience.

A preliminary survey was also carried out among students in order to collect information about their interests, opinions, perception of engineering and engineers, etc.
Very interesting research labs visit Very interesting companies visit Event was well organized Very important the task of the volunteers It should only be for girls

Female (n=276) Male (n=172)

Figure 5. Direct evaluation of Girls’ Day. Differences expressed according to gender.

Figure 5 shows the attendants’ direct evaluation of the activity. In general this edition of Girls’ Day received a very positive evaluation, more so by women than by men, with a clear preference for a longer and more laboratory-centered event. 94.6% of females and 81.4% of males would recommend attending the event. An interesting fact is that the attendees were not too convinced of the convenience of restricting the activity to girls. Male attendees are relatively more favorable to it being a girls-only event than female attendees.

3. Conclusions

The reality is that in Spain, like in many other countries and cultures, women choose engineering as a career less frequently than men. The gender distribution of engineering students varies according to countries and engineering specialties but the under-representation of women is prevalent. Since it appears that gender differences in interest levels emerge during childhood, there is a need for educators and researchers to (a) understand the factors that determine children’s occupational interests and goals, and (b) develop efficient programs aimed at increasing the interest of girls in engineering.

This paper presents a step in this direction: an outreach activity known as Girl’s Day, which was performed on November 11th 2008 in Zaragoza, Spain.

The activity itself has had a positive impact on informing 16 year-old high-school students and improving their views of engineering in general, has slightly motivated them to pursue engineering careers and has changed gender-biased views of the profession. Girls’ Day has been very positively evaluated: 94.6% of females and 81.4% of males would recommend attending the next event.

After analysing the results of the activity, a general conclusion has been the need to lower the age of the future attendants and the need to gear future activities not only to students but to parents, tutors and perhaps high-school teachers as well.

4. Acknowledgements

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5. References


