

Women and Technology: The Spanish Scenery

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Abstract

Since the appearance of the first woman engineer in the 50's till now, a massive incorporation of women in the technology area (more quantitative than qualitative) is being produced. This evolution has placed Spain over the medium world level. This poster intends to gather information to synthesize present situation of women-technology relationship in the Aragón Autonomous Region and in Spain. Moreover, the change in the latest years is shown, framed in context of the European reference system.

The study of the gender variable is confronted not only at educational but also at labour market level. Statistics are presented about the evolution of the presence of women from the first education levels and in the choice of the technological options in the secondary level. The situation is shown as well at University level and in the technological research world. With regard to the labour market, statistical data about the incorporation into work, increasing reality since the 80's, are included.

This poster intends to give keys for the analysis about this quick evolution. It gives a historical perspective inside the Spanish framework and allows to suspect future tendencies.

Key Words

Gender studies, women-technology, Spanish educational system, Spanish University system, women representation, female position, labour marketplace, Aragón.

1. Introduction

The aim of this poster is the study of women's position within the technical areas in the Spanish society. For this purpose not only the educational field, considering the evolution from the Secondary to the University level, but also the labour market area are evaluated. In the research it can be observed the choices that women take along their lives with regard to the technical scope.

The work of gathering all the necessary data has required a laborious effort since the sources consulted were of different kinds, the data were from different periods of time and this field is almost unstudied.

The scope of the study is bounded within the Spanish University, making a comparison with the position of the University of Zaragoza (Aragón). The basic characteristics of Spain and Aragón, just to situate them in the Europe, can be found in section 2. In section 3 some significant percentages about the choices of women at secondary level with respect of the technical options are shown. A chronological graph with the evolution of women in the technical Universities from the '70 (3%) till now (22.66%) is displayed in section 4, including also data about the Ph. Degree options. Information about the position of women within the labour market can be found in section 5. These data are complemented with a study of the ratio of women that belong to the Spanish Section of the IEEE in section 6. Finally, section 7 summaries a few conclusions.

2. A brief description of Spain and Aragón

Spain covers an area of 504,759 square kilometres and has a population of 39,662,742 (May 1996). Spain is a parliamentary monarchy and belongs since 1986 to the European Union. According to the 1978 Constitution, Spanish State is organised into Municipalities, Provinces and Autonomous

Communities. The seventeen Autonomous Communities assume essential powers, including responsibility in educational matters.

Aragón, one of these Communities, covers an area of 47,720 (9.45% of Spain) square kilometres and has a population of 1,187,546 (May 1996), which means a 3% of the Spanish population. The capital of Aragón is Zaragoza, the fifth city in Spain (referred to its population). Aragón depicts a representative example of the mean situation of Spain. In fact, Zaragoza is considered as a reference in market studies. Aragón has got, since February 1999, full powers to administer education responsibilities, including University.

3. The first technological choice in Spain. Women and Technology in Secondary Education

The educational system in Spain is changing. In the poster we present some data corresponding to the former educational system but also some data corresponding to the new one. An explicative chart describing Spanish educational system has been included.

Relevant data is revealed by our survey. For example, a significant change, in quantitative terms, has been produced in women's education. There is almost full rate of women compulsory education and women are a majority at University (51.4%). Nevertheless, the rate of illiterate women is still higher (71.3% of the total). Another important lack, that has been already pointed out by the "Instituto de la Mujer" (Spanish Women Institution -the national advisory board for gender issues-), is the low rate of women in technical and scientific fields. Secondary education statistics reveal that women are majority in all possible options except for the technical ones, in which their presence is much lower. For example, in COU (last year of pre-University education), they represent only a 36.72%. Things get worse in Vocational Training (FP), where women are only 8.6% in technical

branches. Regarding to Aragón, percentages are in general slightly lower than in Spain. All these data are presented, in different graphs, in the poster.

4. Spanish University education

The rapid evolution of female presence in Architecture and Engineering studies in Spanish universities is presented, giving a historical perspective from the 60's to the 90's. Women presence has evolved from 2.43% in 1969 to 22.66% nowadays (this percentage is slightly higher, 24.32%, at the University of Zaragoza). The comparison between these data and the female proportion in other areas of knowledge is shown, as well as a detailed list of all the current technical careers available in Spain specifying female ratio. These results yield interesting conclusions. The poster also compares technical PhD thesis presented by women (17% of the total) with non-technical ones (71%).

5. Labour Marketplace

In Spain, on one hand, the incorporation of women to labour market keeps an increasing pace during the last decades. But, on the other hand, the unemployment rate is still much worse for women than men. For example, recent data (1998) yields the following results: 13.1% unemployment rate for men and 26% for women. In the particular case of technical areas, 9.9% of the graduated males are unemployed opposite to the 21.7% of women.

6. IEEE and WIE Affinity Group in Spain

Our survey includes a study about the position of women within the IEEE Spanish Section. The results are not positive, as they show that, in average, only 7.5% are women and that there are no

women in “Life” and “Fellow” categories. Fortunately, the student rate is increasing hard, and represent a 13.33% (1999). Nevertheless, this ratio is still below the 22.66 percentage of female technical students in Spanish Universities: the recently founded WIE Affinity Group in Spain has a long way ahead.

7. A few conclusions

This study has revealed the following interesting conclusions:

- The women and technology situation in Spain is, referred to the rest of the European Union, over the mean.
- This situation has evolved rapidly in near past.
- Comparing rates of women taking technical options in secondary education to women in technological University careers, we are able to conclude that a third of them give up this choice before entering University.
- Although Spain is not a worst-case example in the European context, the relative situation of women and technology in Spain and in Aragón, is still negative in absolute terms.
- The labour position of female technicians, engineers and architects in Spain still unveils a dramatic situation compared to men.

The information presented in the poster describes the position of women and technology in Aragón and Spain. An intensive gathering work has been done to collect this information as it had been never published all together before. This work has detected the lack of gender and technology studies in our

country and has revealed further research lines. It may also be used to define possible fields of action in order to continue in the still long way to equality.

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Biographies

Pilar Molina (Associate IEEE) is member of the Department of Electronics and Communications at the University of Zaragoza, Spain. She obtained her Telecommunications Engineer degree in 1997. Currently she is working in her Ph.D. Thesis in radiofrequency class E power amplifiers for wireless applications. Founder member of the association Women in Science and Engineering of Aragón (Spain) and founder member too of the WIE Affinity Group in Spain.

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Dolores Rubio is member of the Mechanical Engineering Department at the University of Zaragoza, Spain. She obtained her Industrial Engineering Degree from the University of Zaragoza in 1996. Nowadays, she is a PhD candidate in Mechanical Engineering. Her areas of interest include the study of brittle materials and their structural behavior, involving topics as ceramic materials, Computational Mechanics and Fracture Mechanics. She is founder member of the association Women in Science and Engineering of Aragón (Spain).