SPANISH NATIONAL REPORT on Gender, ICT and STEM

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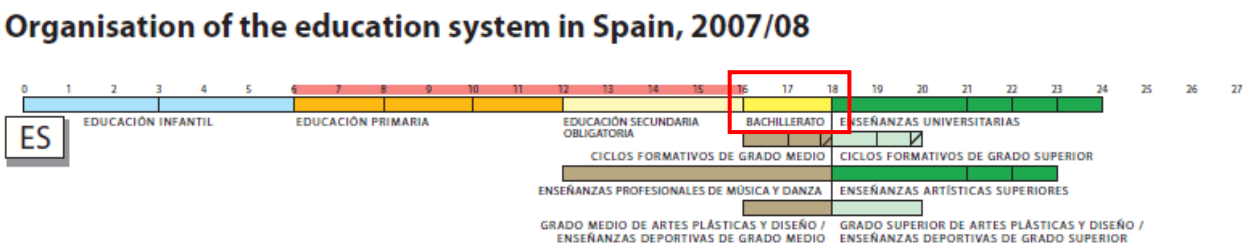
1. Introduction

a) General organization of the education system

The Spanish organization of the education system is regulated under the 2006 *Ley Orgánica de Educación*, LOE (Act on Education).

In this report we make a general picture of the Spanish Education System focused on the *Bachillerato* (Upper Secondary Education) stage.



* Source: Euridyce

Mainstream education covers:

Pre-primary education.

Primary education.

Compulsory secondary education (ESO).

Bachillerato (Upper Secondary)**.**

Vocational training.

Adult education.

University education.

In the Spanish education system, secondary education is comprised of compulsory secondary and post-compulsory secondary. The first, compulsory secondary education (ESO), covers four school years and must be completed by all pupils after finishing primary education. Post-compulsory secondary education is made up of two branches: a) academic, by means of the two-year *Bachillerato*, leading towards University, and b) vocational, and intermediate vocational training, the duration of which varies in the different *cycles* and technical branches.

The *Bachillerato* is the last stage of Secondary Education. It is not compulsory, and with a duration is of two courses. The *Bachillerato* constitutes the general branch in post-compulsory secondary education. Students access this educational level from the age of 16 years after completing the compulsory secondary education (ESO). It comprises two academic years and it is developed in different types within each pathway. Organized in a flexible manner, in order to offer specialized education in accordance with students' educational perspectives and

interests, or for them to enter the job market on its completion; students may stay a maximum of four years, consecutively or not, in mainstream Bachillerato.

b) Specialization of studies at Bachillerato level

Drawing up the curriculum

The 2006 Act on Education establishes a new organization of the *Bachillerato* reducing to three the different types of the *Bachillerato*, namely Arts; Sciences and Technology; and Humanities and Social Sciences. The subjects related to STEM could be included on Sciences and Technology type as shown in the following table:

Table 5.7: Core curricula for the Bachillerato and teaching load regulated by the *LOE*

Common Subjects			
Contemporary World Sciences (70 hours) Physical Education (35 hours) Philosophy and Citizenship (70 hours) History of Philosophy (70 hours) Spanish History (70 hours) Spanish Language and Literature, and Co-official Language and Literature of the relevant Autonomous Community (210 hours) Foreign Language (210 hours) Religion/Study Hall (70 hours)			
Subjects linked to each branch of the Bachillerato (90 hours per subject)			
Arts		Humanities and Social Sciences	Sciences and Technology
Plastic Arts, Image and Design	Performing Arts, Music and Dance		
Culture Audiovisual Artistic Drawing I & II Technical Drawing I & II Design History of Art Graphic and Plastic Expression Techniques Volume	Musical Analysis I & II Applied Anatomy Performing Arts Culture Audiovisual History of Music and Dance Universal Literature	Economy Business Economy Geography Greek I & II History of Art Contemporary World History Latin I & II Universal Literature Mathematics and Applied Sciences I & II	Biology Biology and Geology Earth and Environmental Sciences Technical Drawing I &II Electro-technology Electrotecnia Física Physics and Chemistry Mathematics I & II Chemistry Industrial Technology I & II

Source: November 2nd Royal Decree 1467/2007. Spanish Official Gazette no. 266, November 6th, 2007.

c) Correspondence between Bachillerato and the University

Each *Bachillerato* modality has its correspondence with one or two options in order to access to the university, and they are connected to some university careers. There are five access options:

Modalities of *Bachillerato*		**Access options to the University**
SCIENCIES	→	SCIENTIFICAL-TECHNICAL
	→	HEALTH
TECHNOLOGY	→	SCIENTIFICAL-TECHNICAL
HUMANITIES AND SOCIAL SCIENCIES	→	HUMANITIES
	→	SOCIAL SCIENCIES
ARTS	→	ARTS

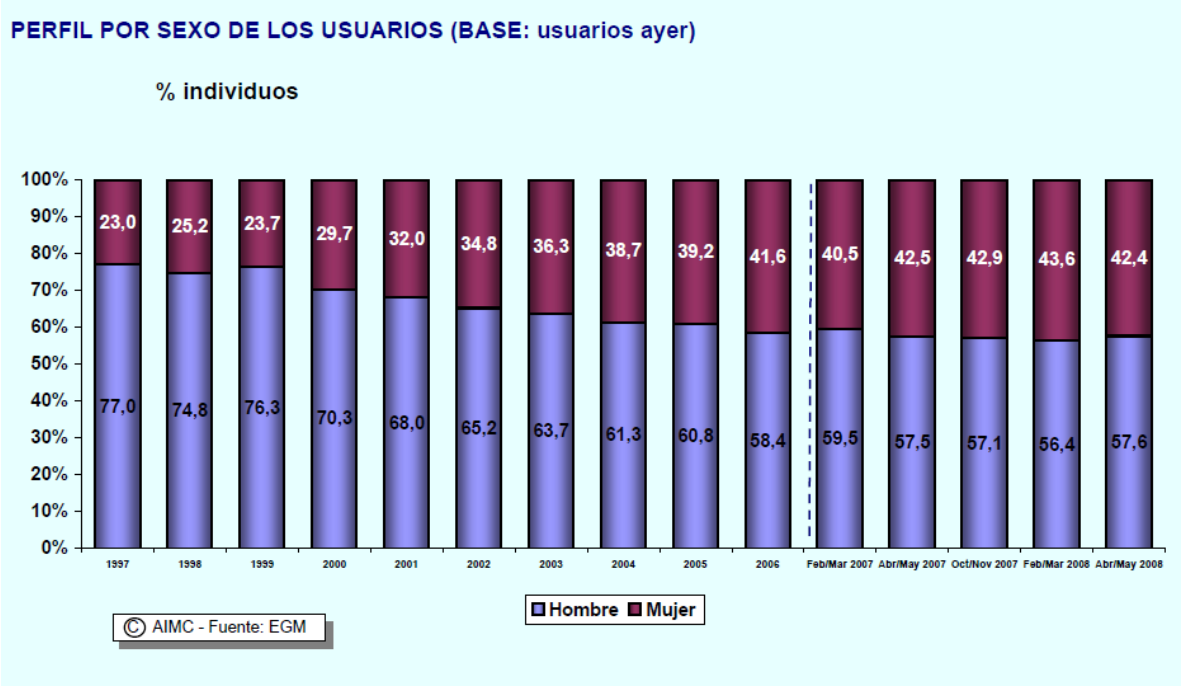
The modality *Scientifical-Technical* is the one that leads the students to the correspondence with STEM/ICT related bachelor degrees at University level. Some of the careers are:

Bachelor, Architect or Engineer:	**Graduate (diploma), Technical Architect or Technical Engineer:**
Business Administration	Technical Architecture
Architecture	Business Science
Biology	Technical Aeronautical Engineering, esp. Aero motors
Biotechnology	Technical Aeronautical Engineering, esp. Aircrafts
Environmental Science	Technical Aeronautical Engineering, esp. Air Navigation
Marine Science	Technical Aeronautical Engineering, esp. Airports
Economics	Technical Aeronautical Engineering, esp. Equipment and Aerospace Materials
Aeronautical engineering	Technical Agricultural Engineering, esp. Agropecuarian Exploitations
Agricultural Engineering	Technical Agricultural Engineering, esp. Horticulture and Gardening
Road, Canal and Port Engineering	Technical Agriculture Engineering, esp. Agrarian and Food
Forest engineering	Technical Agriculture Engineering, esp. Rural Mechanization and Homesteads
Mining Engineering	Technical Civil Engineering, sp. Hydrology
telecommunications engineering	Technical Civil Engineering, sp. Civil Construction
Geological Engineering	Technical Civil Engineering, sp. Urban Transport and Services
Industrial Engineering	
Computer Engineering	
Ocean and Marine Science	
Chemical Engineering	
Physics	
Geology	

Mathematics Chemistry	Technical Mining Engineering, sp. Mining Exploitation Technical Mining Engineering, sp. Energy Resources, Fuel and Explosives Technical Mining Engineering, sp. Metallurgy Technical Mining Engineering, sp. Test Drilling and Prospecting Technical Mining Engineering, sp. Miner Electromechanical Installations Technical Telecommunication Engineering, sp. Telecommunication Systems Technical Telecommunication Engineering, sp. Electronic Systems Technical Telecommunication Engineering, sp. Image and Sound Technical Telecommunication Engineering, sp. Telematics Technical Engineering in Topography Technical Engineering in Industrial Design Technical Engineering in Computer Management Technical Engineering in Computer Systems Technical Forestry Engineering, sp. Forestry Industries Technical Industrial Engineering, sp. Electricity Technical Industrial Engineering , sp. Industrial Electronics Technical Industrial Engineering, sp. Mechanics Technical Industrial Engineering, sp. Industrial Chemistry Technical Industrial Engineering, sp. Textile Technical Naval Engineering, sp. Marine Structures Technical Naval Engineering, sp. Propulsion and Ship Services Statistics Naval Engineering Maritime Navigation Optical and Optometry Radio-Electronics, sp. Naval Graduate in Industrial Design and Product Development Engineering Graduate in Technology and Industrial Production Graduate in Aeronautics Management

2. Access to Internet by gender

The table below shows data about household use of Internet by gender within the scope of the General Study on Media (*Estudio General de Medios*, EGM). Levels of Internet use by women have decreased for the first time during the 2066-2007 period, but they seem to have stabilized at around 42% at April 2008.



Profile by gender of Internet use

*Source: AGM, April 2008.

3. Data on STEM related fields and pathways at High School, by gender and academic option)

Many factors impact women's access and use of ICTs, including the educational and cultural constraints. As shown, there is a clear underrepresentation of women in STEM at Upper Secondary Education level, although the difference WOMEN/men decreases steadily year by year.

	Total Public education	Women	Men	% women
Arts	5.781	4.062	1.719	70%
Science and Health	56.096	30.925	25.171	55%
Social Science and Humanities	63.860	44.562	19.298	70%
Technology	**11.469**	**2.571**	**8.898**	**22%**
Total	137206	82120	55086	60%

Students who finished *Bachillerato* (Upper Secondary education) by gender and academic option, expressed in thousands and percentage, 2004-2005.

*Source: INE, Ministerio de Educación y Ciencia, 2009

4. Data on enrollment in STEM/ICT related degrees at university level (by gender and career option)

Women's enrollment share in *Scientifical-Technical* related careers is clearly the lowest. As the table below shows, the share of women was around 30% in 2008.

	Total	Women	Men	% women
Scientifical-Technical	**43.555**	**13.073**	**30482**	**30%**
Health	50.615	33.701	16914	67%
Social Sciences	64.293	40.978	23315	64%
Humanities	23.022	16.977	6045	74%
Arts	4.743	3.374	1369	71%
Combined	9.925	5.253	4672	53%
TOTAL	196.153	113.356	82797	58%

University Entrance Examination, 2008
Student enrollment by pathway and gender, expressed in thousands and percentage.

*Source: INE, Ministerio de Educación y Ciencia, 2009

5. Data on employment of woman in IT sector.

Occupational employment data shows that there are significant differences in employment rate of men and women in ICT sector. The share of women in ICT occupations was around 20%.

	Total	Men	Women	% Women
Manufacture	4.117,70	3.525,90	591,8	14,4%
Office machine, computer equipment, threads and electric cables (CNAE 30, 3130)	699	628,80	70,2	10,0%
Electronics, equipment and radio apparels, TVs and telecommunications. (CNAE 32)	2.174,30	1.855,20	319,1	14,7%
Precision mechanics (CNAE 3320,3330)	1.244,40	1.041,90	202,5	16,3%
Services	11.065,50	8.523,60	2.541,90	23,0%
Wholesale machinery and equipment Commerce (CNAE 5160,5167	..		..	
Telecommunications (CNAE 6420)	1.784,80	1.426,20	358,6	20,1%
Informatics activities (CNAE 72)	8.863,80	6.741,50	2.122,30	23,9%
Consulting on Informatics equipment and applications, and computer applications supply (CNAE 721,722)	8.120,70	6.182,30	1.938,40	23,9%
Data processing and activities related with database (CNAE 723,724)	478,5	342,60	135,9	28,4%
Maintenance and repairing of office machinery, accounting and informatics equipment; other activities related to informatics (CNAE 725,726)	264,6	216,60	48	18,1%

TOTAL ICT SECTOR	**15.183,20**	**12.049,50**	**3.133,70**	**20,6%**
TOTAL BUSINESS SECTORS	82.869,80	58.676,50	24.193,30	29,2%

Spanish ICT Sector, 2006
Employment of women in ICT sector by field, expressed in thousands and percentage.

*Source: Instituto Nacional de Estadística (INE), 2009

6. Base salary. Hourly wage by gender and activity sector.

The highest difference in hourly wage between men and women is found in the Spanish Industry sector, where ICT related jobs can be included. As the table below shows, the differences has stabilized around 3,6 Euros between 2004 and 2006.

	2004		2005		2006	
	Women	Men	Women	Men	Women	Men
Total activity sectors	9,71	12,11	9,95	12,25	10,60	13,05
Industry	**9,68**	**13,33**	**9,95**	**13,63**	**10,57**	**14,17**
Construction	9,27	9,96	9,49	9,92	10,07	10,38
Servicies	9,73	12,55	9,96	12,73	10,62	13,68

Spanish Industry-ICT sector wage, 2004-2006.
Hourly wage for women, expressed in Euros.

*Source: Instituto Nacional de Estadística (INE), 2009

7. ANNEX

Sources used in this report:

Study type	Used for	Source	Title	Link
Report	1.Introduction	EURIDYCE	The Information Database on Education Systems in Europe: The Education System in Spain. (in English)	http://eacea.ec.europa.eu/ressources/eurydice/eurybase/pdf/0_integral/ES_EN.pdf
Report/ data	1.Introduction	Educaweb	Sistema educativo Bachillerato. (in spanish)	http://www.educaweb.com/edw/seccion.asp?SeccioID=4156
Report	1.Introduction	Bridge	Gender and ICTs, 2004 (in english)	http://www.bridge.ids.ac.uk/reports_gend_CEP.html#ICTs
Data	2. Access to Internet by gender	EGM	General household use of Internet by gender within the scope of the Estudio General de Medios (EGM)	http://www.aimc.es/aimc.php
Data	3. STEM related fields and pathways at pre-university level.	INE	Resultados académicos. Curso 2004-2005. Tecnologías de la información en la enseñanza no universitaria	
Data		INE	Alumnado que terminó **Bachillerato** por CCAA, titularidad del centro, sexo (1) y opción académica.	http://www.ine.es/jaxi/tabla.do?path=/t13/p001/e05/a2004-2005/l0/&file=rd10008.px&type=pcaxis&L=0
Data	4. Data on enrollment in STEM/ICT related degrees at university level	INE	Pruebas de acceso a la universidad. Año 2008.	
			Pruebas de acceso 2008 según opción del alumno Alumnado matriculado y aprobado por opción, sexo, tipo de indicador y convocatoria.	http://www.ine.es/jaxi/tabla.do?path=/t13/p411/2008/l0/&file=02001.px&type=pcaxis&L=0
Data	5. Data on employment of woman in IT sector.	INE	Personal en I+D (EJC) en el sector TIC por ramas de actividad del sector TIC, clase de personal y género.	http://www.ine.es/jaxi/tabla.do?path=/t14/p197/e01/a2006/l0/&file=01020.px&type=pcaxis&L=0
Data	6. Base salary. Hourly wage by gender and activity sector.	INE	Encuesta de estructura salarial. Serie 2004-2006. Ganancia por hora normal de trabajo. Sexo y Sectores de actividad. Unidades:euros.	http://www.ine.es/jaxi/tabla.do?path=/t22/p133/2004-2006/l0/&file=04001.px&type=pcaxis&L=0