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Impact of Gender in Adopting and Using ICTs in Spain

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Abstract

The main objective of this paper is to analyse the impact of gender in adopting and using new information and communication technologies (ICTs) in Spain. It is widely accepted that men tend to be the first to use new technologies and to gain significant benefits from doing so, both at home and work. However, further research on gender and new technologies, such as ICTs, is still needed in order to better understand differences between men and women. On the one hand we show that percentage of ICTs users is higher among men. On the other hand, our results confirm that women also present lower frequency of ICTs use. We examine how the differences in adoption and use of ICTs are moderated by cultural and socioeconomic aspects. Differences appear mainly in the lower levels of education and in the rural area. Therefore, it highlights the necessity of taking into account those aspects to remove the gender digital divide totally. We also underline the importance of changes in gender roles and the increase of the participation of women in the Spanish labour force.

Key words: gender; skills; education, work; information and communication technologies; rural area; Spain; digital divide.

Resumen

El objetivo principal de este trabajo es analizar el impacto del género en la adopción y utilización de las tecnologías de la información y la comunicación (TIC) en España. Está generalmente aceptado que los hombres tienden a ser los primeros en usar las nuevas tecnologías y en obtener ventajas significativas de ello, tanto en el hogar como en el trabajo. Sin embargo, sigue siendo necesarios nuevos estudios sobre la relación entre el género y las nuevas tecnologías, como las TIC, para entender mejor las diferencias entre hombres y mujeres. Por un lado, se observa que el porcentaje de usuarios de las TIC es más alto entre los hombres. Por otro lado, nuestros resultados confirman que las mujeres también presentan menor frecuencia de uso de las TIC. Se muestra también como las diferencias de adopción y uso de las TIC son moderadas por aspectos culturales y socioeconómicos. Las diferencias aparecen principalmente en los niveles inferiores de educación y en las áreas rurales. En definitiva, destaca la necesidad de tener en cuenta estos aspectos para eliminar totalmente la brecha digital debida al género. También destaca la importancia de los cambios en los roles en función del género y el aumento de la participación de la mujer en el mercado de trabajo en España.

Palabras clave: género; habilidades; educación, trabajo; tecnologías de la información y la comunicación; área rural; España; brecha digital.

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1. Introduction

Along the past 20th century there have been a huge range of changes. One of the most important has been the transformation of the social role of women. Historically, women have been involved in jobs without remuneration, typically working in domestic labour. But in the last years their progressive incorporation into the labour market has supposed a point of inflexion. During the last decades, the labour force participation rate for women has been raised dramatically. This massive incorporation of women to the labour market has also stimulated their possibilities of access to the new technologies. However, a gender digital divide still exist, not only in the developing countries, but also in some developed countries, such as Spain. In most cases, in contrast to the general patterns of women participation increase, the gender distribution of ICT-specialist is an outlier.

2. Women and Technology

Nowadays, Information and Communication Technologies (ICTs) are increasingly recognized as a powerful tool for facilitating sustainable human development (UNDP-UNIFEM, 2004). Remarkable changes brought by ICTs have created new economic and social opportunities the world over. However, several studies highlight gender inequalities. Evidence shows that men tend to be the first to use new technologies and to use them more, whereas women are underrepresented both as users of computers and employees in the ICTs business. This reflects the so-called a gender digital divide.

"Digital divide" refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard to both their opportunities to access information and communication technologies (ICT) and to their use for a wide variety of activities. More specifically, the gender digital divide indicates the under-representation of women in the ICTs-related fields (Bucy, 2000; Castaño, 2005; Fink and Kenny, 2003; Korupp and Szydlik, 2005; among others). Academic literature has commonly distinguished between first and second digital divide.

First Digital Divide: It refers to the gap in the access to new technologies. For example, according to the e-Living survey (Raban, 2004), the gender gap in the PC use is quite high in some countries, and there is even larger gap in Internet use (up to 18%). The largest gaps in the PC and Internet use are showed in Italy and Germany.

	PC use			Internet use		
	Female	Male	Gap	Female	Male	Gap
UK	63%	70%	-7%	55%	61%	-6%
Italy	56%	71%	-15%	42%	59%	-17%
Germany	61%	75%	-14%	44%	62%	-18%
Norway	74%	85%	-11%	64%	78%	-14%
Bulgaria	15%	13%	2%	8%	9%	-1%
Israel	63%	65%	-2%	46%	52%	-6%

Table 1. ICTs use. Source: e-Living survey (2004)

Second Digital Divide: It includes the gap in the quantity and intensity of new technologies use. Distinguishing between light and heavy users, results of e-Living survey (Raban, 2004) show up that more than 60% of women are light users, while they represent only 40% of the heavy users group. As Dholakia and Kshetri (2002) discuss, men and women seem to be specialized in different tasks and have different preferences. According to the Statistical Office of the European Communities (Eurostat), gender gap still persists in 2008.

	Female	Male	Gap	Female	Male	Gap	Female	Male	Gap
EU (27 countries)	41%	49%	-8%	47%	56%	-9%	53%	59%	-6%
EU (25 countries)	42%	51%	-9%	49%	58%	-9%	54%	61%	-7%
EU (15 countries)	44%	53%	-9%	51%	60%	-9%	56%	63%	-7%
Euro area	41%	50%	-9%	48%	57%	-9%	53%	60%	-7%
Bulgaria	21%	23%	-2%	28%	29%	-1%	29%	31%	-2%
Czech Republic	33%	38%	-5%	39%	45%	-6%	48%	54%	-6%
Denmark	76%	80%	-4%	74%	79%	-5%	78%	83%	-5%
Germany	54%	65%	-11%	58%	70%	-12%	62%	73%	-11%
Estonia	56%	57%	-1%	59%	58%	1%	62%	61%	1%
Greece	18%	27%	-9%	23%	33%	-10%	28%	38%	-10%
Spain	35%	44%	-9%	40%	49%	-9%	45%	54%	-9%
France	37%	42%	-5%	54%	61%	-7%	64%	61%	3%
Italy	26%	36%	-10%	28%	39%	-11%	32%	43%	-11%
Cyprus	27%	32%	-5%	32%	37%	-5%	32%	39%	-7%
Latvia	45%	47%	-2%	51%	54%	-3%	55%	59%	-4%
Lithuania	37%	38%	-1%	44%	46%	-2%	49%	51%	-2%
Luxembourg	55%	76%	-21%	63%	81%	-18%	66%	88%	-22%
Netherlands	71%	82%	-11%	77%	85%	-8%	80%	86%	-6%
Austria	49%	61%	-12%	55%	67%	-12%	59%	73%	-14%
Poland	32%	36%	-4%	37%	41%	-4%	43%	46%	-3%
Portugal	28%	35%	-7%	31%	39%	-8%	34%	43%	-9%
Romania	17%	20%	-3%	20%	24%	-4%	25%	28%	-3%
Slovenia	42%	51%	-9%	48%	50%	-2%	51%	53%	-2%
Slovakia	39%	47%	-8%	49%	53%	-4%	59%	65%	-6%
Finland	70%	72%	-2%	73%	77%	-4%	77%	80%	-3%
Sweden	76%	84%	-8%	72%	79%	-7%	81%	86%	-5%
United Kingdom	51%	63%	-12%	61%	70%	-9%	66%	74%	-8%
Norway	73%	80%	-7%	78%	83%	-5%	83%	88%	-5%

*Data for Macedonia, Malta, Turkey, Iceland, Belgium, Ireland, Hungary are not available

Table 2. Individuals regularly using the Internet, by gender and type. Source: Survey on Information and Communication Technologies in enterprises, Eurostat

The percentage of women who regularly use the Internet is much lower than that of men, mainly in countries like Luxembourg, Austria, Italy and Germany, where the gap exceeds 10%. Only France and Estonia present a higher rate of women using the Internet more regularly than men.

There are also differences depending on the type of technology. For example, with respect to the use of email, Dholakia (2004/2005) shows that women report using it more than men. Recently, Kovačić and Vukmirović (2008) have shown that gender only has a significant impact on regular Internet use, while regular PC and mobile phone use were not affected.

3. Women and ICTs Employment

During the last years, women have presented low shares of employment than men. Additionally, penetration of ICTs has run parallel to the rate of employment, so the use of new technologies has been higher for men than women. Moreover, among ICTs-using occupations, women tend to have much higher shares of office and secretarial occupations and lower percentage in scientific and professional ones (OECD, 2007).

Data show that women are still underrepresented in many specific professions, for example they comprise just 11% of engineers. As Lenka Simerska of Women's Networking Support Programme -a global organisation supporting women's empowerment through the use of ICTs- highlights,, women are very poorly represented in ICTs employment and "the situation is getting worse because of the low number of girls interested in studying technical subjects at universities". Brynin et al. (2003) question if differences are due to a cultural response to technology, positive for men and negative for women.

However, according to Eurostat, in the EU, 51% of almost 59 million persons employed in science and technology occupations in 2006 were female, and in Lithuania the percentage reaches 72% of women (Meri, 2008). Another example is the software and services outsourcing industry in India, where a large number of women have entered this field. So, gender parity is being gradually achieved.

4. Women and ICTs in Spain

In this part of the article we review the position of women in the use of a specific ICT such as Internet. We have selected this technology because it is the main exponent of the digital age. We examine its use in Aragón, the region of the north-east of Spain where the University of Zaragoza is located. To achieve our goal in this paper, we have used data obtained by the Aragonese Observatory of the Society of the Information (AOSI, 2008) during the period 2004-2007.

4.1. Possibility of Access

Firstly, we are going to analyse differences between men and women according to the place where they access to the Internet. As we can see in the following table, there are not important differences if we distinguish among home access, workplace access and study place access. Although men tend to be more likely technological innovators than women, at the household level we show that the percentage of women using Internet is higher than the percentage of men. As women spend more time at home they have greater opportunity to use ICT there.

	Female	Male	Gap
Home	80.73%	78.53%	2,20%
Workplace	30.87%	34.27%	-3,40%
Study place	84.89%	88.54%	-3,65%

Table 3. Places of use. Source: AOSI (2008)

However, when we make a distinction between urban and rural women, we find that home access in rural areas is smaller than it is in urban case. Data show a digital divide of more than 20 percentage points. On the contrary, access in the study place is higher among rural women, and workplace access differences are insignificant. It can be due to a mayor presence of women at the study place in rural areas. However, it probably indicate that the cultural differences between rural and urban life still exist, not at the study or workplace, but at home.

	Rural	Urban	Gap
Home	59.69%	83.57%	-23,88%
Workplace	33.66%	30.50%	3,16%
Study place	91.27%	84.03%	7,24%

Table 4. Women access to Internet by area. Source: AOSI (2008)

4.2. Characteristics of Internet Access

According to our data, gender divide is higher when the "second digital divide" is reviewed. Specifically, differences increase among the group of "frequent users". As we can see on the following table, the gap between men and women in this group almost reaches 15%. This gap is higher than the Spanish one (45% female and 54% male) or the EU (27 countries) one (53% female and 59% male) according to Eurostat (2008) although, in general, women tend to use the Internet less frequently than men in all countries (Brynin et al., 2003).

	Female	Male	Gap
Sometimes	59.82%	69.20%	-9,38%
In the last 3 moths	55.08%	66.43%	-11,35%
Frequent users	43.96%	58.69%	-14,73%

Table 5. Users of Internet by gender. Source: AOSI (2008)

4.3 Socioeconomic Aspects

In this section, we review the relationship between gender use of ICTs and several socioeconomic aspects. We show that the percentage of women who use the Internet is higher than the percentage of men among the group of employees (as opposed to self-employed workers), almost ten points higher. In contrast, the proportion of male users is higher among self-employed workers and pensioners. Finally, there are not significant differences between male and female students.

	Female	Male	Gap
Self-employed	70.47%	77.50%	-7.03%
Employed as employee	87.03%	78.39%	8.64%
Student	98.03%	98.85%	-0.82%
Pensioner	11.47%	25.99%	-14.52%

Table 6. Use of Internet by gender and occupation. Source: AOSI (2008)

According to many studies, education level is one of the major factors that influence technology access and usage. Several studies underline that ICT-adoption behaviour is likely to be influenced by education (Borghans and Ter

Weel, 2005). So, it is necessary to review the importance of education on the women technological adoption process.

Our data allow us to conclude that gender digital divide diminishes when the level of qualification increases. Table 6 shows this point.

	Female	Male	
Five-year degree	93.50%	92.32%	1.18%
Three-year degree	93.13%	96.59%	-3.46%
Secondary school	80.61%	77.56%	3.05%
Primary school	24.99%	42.14%	-17.15%
Without studies	1.40%	6.42%	-5.02%

Table 7. Use of Internet by gender and education. Source: AOSI (2008)

4.4. Activities and Uses of Internet

Men and women have different interests in using the ICTs. If differences on the activities carried out by men and women on the Internet are analysed, some conclusions are obtained. As we can see in the following table, although general patterns are similar, men tend to use the Internet more frequently to read newspapers, listen to the radio, watch TV, to shop online, to play or to download games and to participate in discussions. Conversely, women use the Internet mainly for getting tickets for shows, getting touristic information, booking a holiday or chatting in a higher frequency than men.

	Female	Male	Gap
Look up on a search engine	93.69%	92.02%	1.67%
Send and receive mails	82.70%	88.81%	-6.11%
Read newspapers, magazines, TV, radio	64.41%	74.47%	-10.06%
Touristic information and books	58.24%	50.20%	8.04%
Listen or download music	49.62%	48.38%	1.24%
P2P	43.57%	46.17%	-2.60%
Chat	46.40%	39.40%	7.00%
Information and tickets	42.02%	37.84%	4.18%
Bank operations	31.90%	32.02%	-0.12%
Online purchases	27.78%	34.68%	-6.90%
Play or download games	17.73%	29.14%	-11.41%
Participate in discussions and news groups	12.66%	24.30%	-11.64%

Table 8. Use of Internet by gender and activities. Source: AOSI (2008)

Electronic commerce, namely, buying or selling products or services over electronic systems, have experimented a huge increase in the last years. However, there are differences in the patterns of use between men and women.

First of all, men are more used to getting information on the Internet to support their purchase decision. In our sample, 61.67% of men have used the Internet to this purpose, but only 45.26% of women have done it.

In addition, more than 15% of men have bought online recently, whereas this percentage represented less than 11% in the case of women in 2007.

Differences vary depending on the age of the buyers. As we can see in the next table, older women are the group

where the digital divide is higher. Only 10.12% of women between 55 and 64 years shop on the Internet. It is in this age group where the gender digital divide reaches the highest level, 31.46%. However, there is a cluster where the percentage of women shopping on the Internet is higher than that of men. It is the age group between 35 and 44.

To sum up, we can conclude that the gender digital divide is higher in the first and in the last part of women's labour life.

	Female	Male	Gap
15-24 years	31.62%	43.55%	-11.93%
25-34 years	39.20%	51.67%	-12.47%
35-44 years	40.68%	39.32%	1.36%
25-54 years	15.33%	27.81%	-12.48%
55-64 years	10.12%	41.58%	-31.46%

Table 9. Use of Internet by gender and age. Source: AOSI (2008)

4.5. Barriers of Use

According to the AOSI (2008) information, differences between genders are not significant when we ask non-users about the reason for not using ICTs. The next table shows the main barriers of Internet use:

	Female	Male	Gap
He/She doesn't need it	55.92%	65.87%	-9.95%
He/She doesn't know how to use the PC	53.11%	44.67%	8.44%
He/She doesn't know how to use the Internet	47.41%	38.48%	8.93%
He/She doesn't have a PC	39.21%	44.79%	-5.58%
He/She doesn't perceive Internet utility	28.30%	33.06%	-4.76%
He/She doesn't have time	16.84%	17.19%	-0.35%
He/She doesn't have broadband connection	15.52%	21.03%	-5.51%
He/She doesn't have anybody who can help him/her	12.08%	4.16%	7.92%
Difficulty of use perceived	4.06%	5.94%	-1.88%
It is very expensive	3.99%	2.79%	1.20%
Others	48.20%	37.53%	10.67%

Table 10. Barriers of Internet use by gender. Source: Adapted from AOSI (2008)

In both cases, the lack of necessity is the main barrier to use Internet, followed by their ignorance about PCs and the Internet. We can highlight the absence of someone who helps women to improve their technological skills. 12.08% of women who don't use the Internet affirm that this is the difficulty they find. On the other hand, only 4.16% of men underline this problem.

5. Conclusions

In conclusion, we can sum up that the possibility of access to ICTs is, in general, similar to men and women. According to gender considerations, we show that women have more possibilities to access from home and men from the study or workplace. So, this is not one of the main

causes of the gender digital divide. However we can find a digital divide between urban and rural women. The first ones have higher probabilities to get access to ICTs than the rural ones.

Moreover, differences exist on the intensity of use. Male frequency of use is quite higher than the intensity of female use, with a gap of 10% or more. Taking into account socioeconomic aspects, female use of ICTs is higher than male use among employees, but on the contrary, it is smaller among the self-employed group and pensioners, so we continue seeing a gender digital divide. This gap on the pensioners group is coherent with the gap showed on the 55-64 group, where the gender digital divide is the highest. It is according with those studies that conclude that men do not use ICT more than women, but simply sooner. It allows us to be confident that gender digital divide will decrease in the future, when the younger generations grow up. Moreover, the causes of these differences may be found also in other aspects, such us that women had lower incomes than men. So, it is necessary to resolve wage gap between men and women problems.

Finally, education seems to be also important. As we have seen, the gender digital divide diminishes when the level of qualification increases. However, it is difficult to establish a causality direction. Though there is a relationship between education level and ICTs use, it could be that access to education brings with it greater access to technology. In any case, a clear relationship is showed by our data for the Spanish region analized.

As conclusion, we can highlight that the current situation in the region analysed shows differences between men and women in several aspects, but gaps in ICTs use between genders are diminishing. So, it can be expected that women will close the gap and the percentage of women online will soon be nearly equal to that of men. It is especially important if we take into account that ICTs are a tool to challenge gender inequality and promote women's empowerment in many different ways. In any case, it is necessary to be aware of the potential gender divide and to continue expanding women's capacities through access and use of ICTs.

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