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ICTs and Gender – Evidence from OECD and Non-OECD Countries

by

Pierre Montagnier and Desirée van Welsum

OECD, Directorate for Science, Technology and Industry

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Pierre Montagnier and Desirée van Welsum

OECD[1]

Directorate for Science, Technology and Industry

1. Disclaimer: The opinions expressed and arguments employed in this paper do not necessarily reflect the official views of the Organisation or of the governments of its member countries. A different version of this paper will be discussed by the OECD's Working Party on the Information Economy at its December 2006 meeting with a view to declassification by the ICCP Committee in March 2007.

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pierre.montagnier@oecd.org
desiree.vanwelsum @ oecd.org

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Main points

This document provides an overview of the gender distribution of ICT and ICT-related employment in OECD countries, and where possible also for non-OECD countries. ICT employment patterns are contrasted with overall employment to highlight how different ICT employment patterns are. The document then focuses on participation in ICT related education and training, and differences in ICT access and use by gender. This analysis will be expanded and deepened, particularly on broadband-related issues and impacts, which are not covered here at present, if extra resources come available in 2007-2008.

Overall, participation rates of women in employment tend to be significantly lower than those for men, but their labour market participation is increasing in most countries. In general there is a lower share of women in managerial positions, but a higher share than men in many professional occupations, especially in health-care and education. In contrast to these general patterns, the gender distribution of ICT employment is an outlier in terms of both women's participation and shifts in the share of women in ICT-related employment. Women have low shares of ICT-specialist employment and, and if anything, these shares are decreasing or remaining constant, but rarely show an increase. Among ICT-using occupations women tend to much higher shares of office and secretarial occupations and lower shares in scientific and professional ones.

Women have increased their share in higher education, across most areas of education. The share is particularly high for example in the arts, education and health-related education. However the share of women remains low in engineering and these shares are not increasing rapidly. The shares are even lower for computer science. Although informal assistance from colleagues and learning-by-doing are important ways of acquiring computer skills for all, for women more formal types of training courses may be relatively more important than for men in some countries.

The gender distribution of ICT access is also skewed. ICT access by women tends to lag that of men, but the gaps are generally declining. However the gaps remain large in older age groups, and in areas of newer technologies. Furthermore there are differences in where men and women access the Internet from. Men are more likely to access from both home and work in many countries, although gaps are declining, whereas women are more likely to access from educational establishments. In terms of the use of ICTs there are significant differences in patterns of use across the whole population. For example in their on-line activities women are more likely to engage in shopping and health-related activities, while men are more likely to play games and visit sports pages. These differences are present for all age groups.

This analysis suggests that for both equity and efficiency reasons gender differences in ICT occupations, education, access and use need to be addressed, that further more detailed analytical work on the evolution of ICT occupations, education and use should be undertaken and that the effects of policy on women and ICTs should be analysed in detail.

Introduction

There are a number of reasons for the heightened interest in gender-related issues and the aim to mainstream gender into all aspects of economic and social activity. First, from an equity point of view, women need to fully participate in all aspects of society and economic activity. Second, from an efficiency point of view, women need to be part of economic activity at all levels, from decision-making to execution phases, and this is becoming increasingly urgent in the light of demographic pressures and aging populations in most OECD countries. Furthermore, there is a need to ensure a wide base of ICT skills to drive and enable ICT-related growth and productivity gains, contribute significantly to the design of new products and widen the user base.

ICTs constitute both a goal and a tool for increasing participation of women in society and in the workforce. Good ICT infrastructure is needed for a comprehensive and expanding range of economic and social activities. Achieving economic and social goals and ensuring that the ICT infrastructure, tools and skills are available and can be used to achieve these goals require action from two perspectives: the necessary infrastructure needs to be in place and accessible to all, and access to education and training, employment opportunities and career paths needs to be equal.

> "The so-called digital divide is actually several gaps in one. There is a technological divide – great gaps in infrastructure. There is a content divide. There is a gender divide, with women and girls enjoying less access to information technology than men and boys. This can be true of rich and poor countries alike." **United Nations Secretary-General, Kofi Annan, Statement to the World Summit on the Information Society, Geneva, 10 December 2003**

This study begins by analysing the differences in employment patterns by gender, in general and then in managerial, professional, and ICT-related occupations. While it is also a very important issue, income differences by gender are not covered in this paper. The paper then examines differences in participation in education and training and educational attainment. This is followed by differences by gender in the access and use of selected ICTs. The study concludes with an overall summary of the current situation and some suggestions for further work.

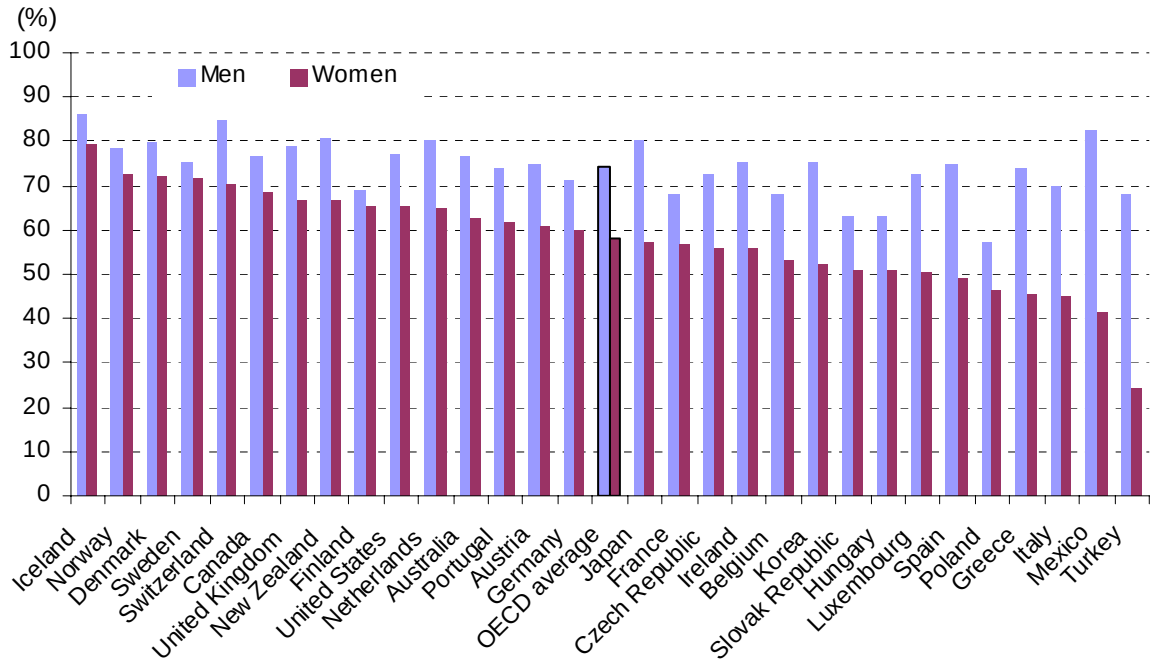
Employment patterns by gender

Occupational employment data show that there are some significant differences in employment rates of men and women. The differences become even more important when broken down by specific types of occupations.

Overall employment

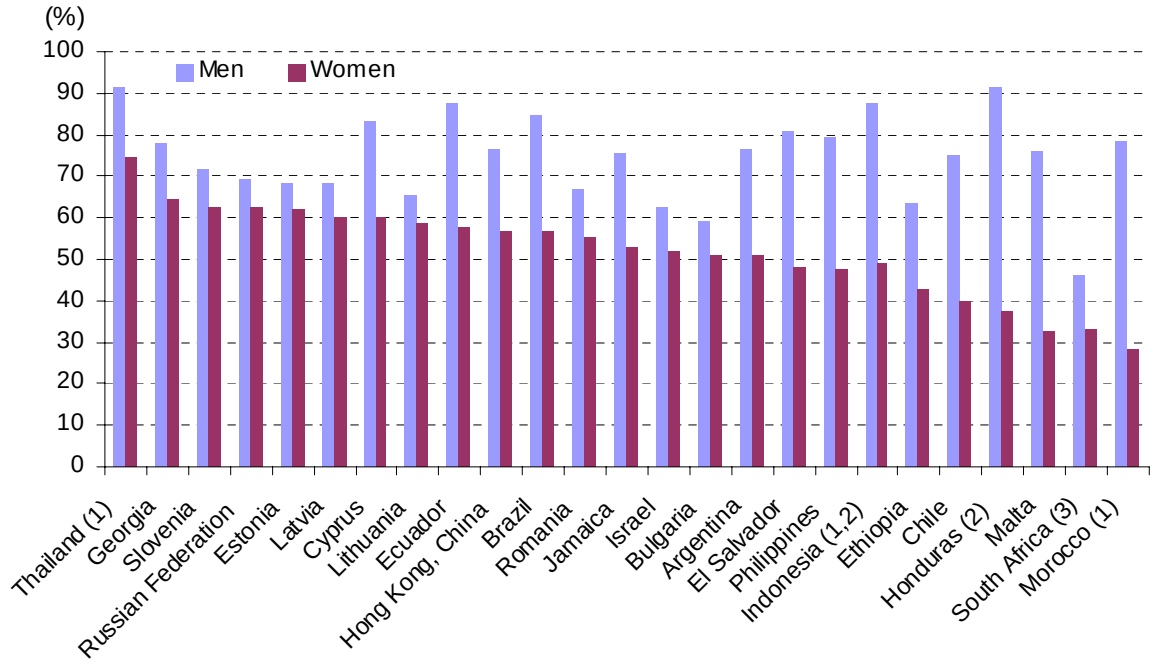
There are significant differences between male and female employment rates in overall employment in OECD countries (Figure 1). Even though there are understandable reasons why some of this gap may persist, for example because women take time off to have children and take care of the family, it should still be possible to reduce them. ICTs can act as an enabling tool, allowing women to work from home, for example. However, in a broader sense, there need to be equal opportunities and access to employment and education, and proper and affordable child care facilities need to be provided (Figure 1). In non-OECD countries the gender gap tends to be larger than in OECD countries (with a few exceptions), and in most non-OECD countries the female labour market participation rate is lower than the OECD average (Figure 2).

Figure 1. Percentage of men and women of working age in employment, OECD countries, 2004



Source: Women and Men in OECD Countries, forthcoming OECD Brochure. Based on OECD Labour force statistics database data, as published in OECD (2006a).

Figure 2. Percentage of men and women of working age in employment, selected non-OECD countries, 2004

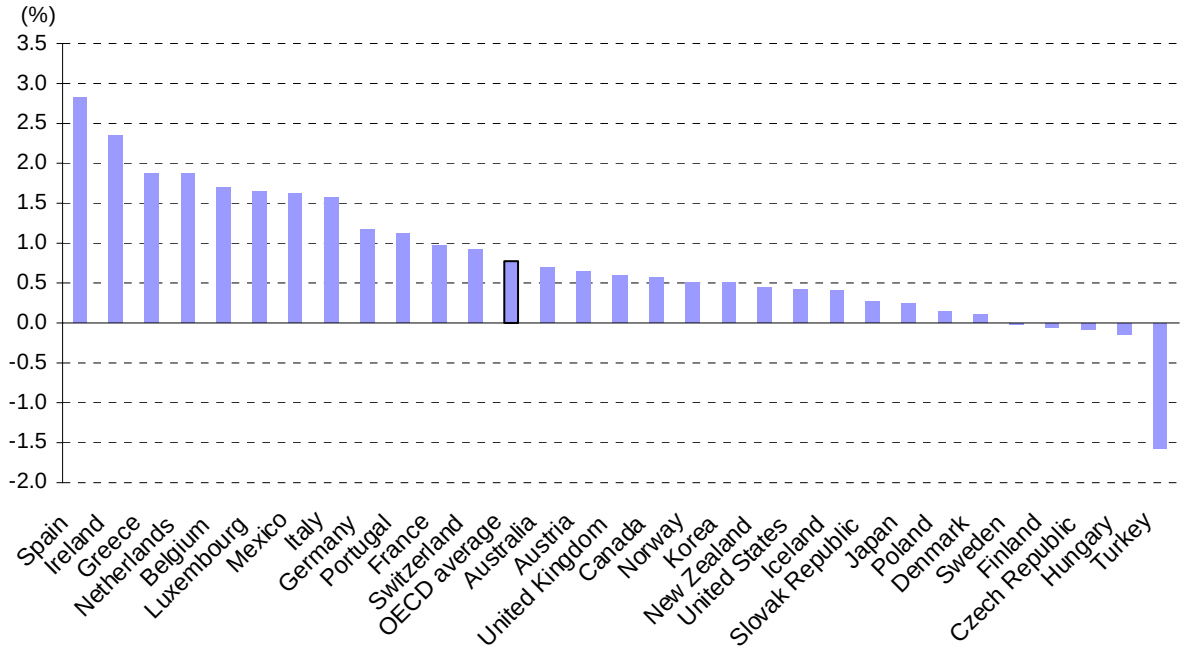


1. 15-59 instead of 15-64 years old.
2. 2005 instead of 2004.
3. 2003 instead of 2004.

Source: OECD, based on data from ILO database, 2006.

Among OECD member countries, the Nordic countries have relatively high female participation rates, as do countries where English is the first language, and participation rates would be significantly higher if other OECD member countries converged towards the rates in these countries. On the positive side, in most OECD countries employment rates are increasing faster among women than men, narrowing the employment gap. Moreover, the countries in where the gap was highest in 2004 (*e.g.* Spain, Ireland, Greece, Belgium, Luxembourg and Mexico), female participation tends to grow relatively fastest compared to growth in male participation rates, suggesting that the gaps between countries may be narrowing as well (Figure 3). This is not true for some countries though, for example in Turkey where the gap was already large and appears to be widening.

Figure 3. Difference between women and men[1] in annual average increases of employment rates, 1991-2004



1. Difference expressed as annual average increase for women minus annual average increase for men.

Source: *Women and Men in OECD Countries*, forthcoming OECD Brochure. Based on OECD Labour force statistics database data, as published in OECD (2006a).

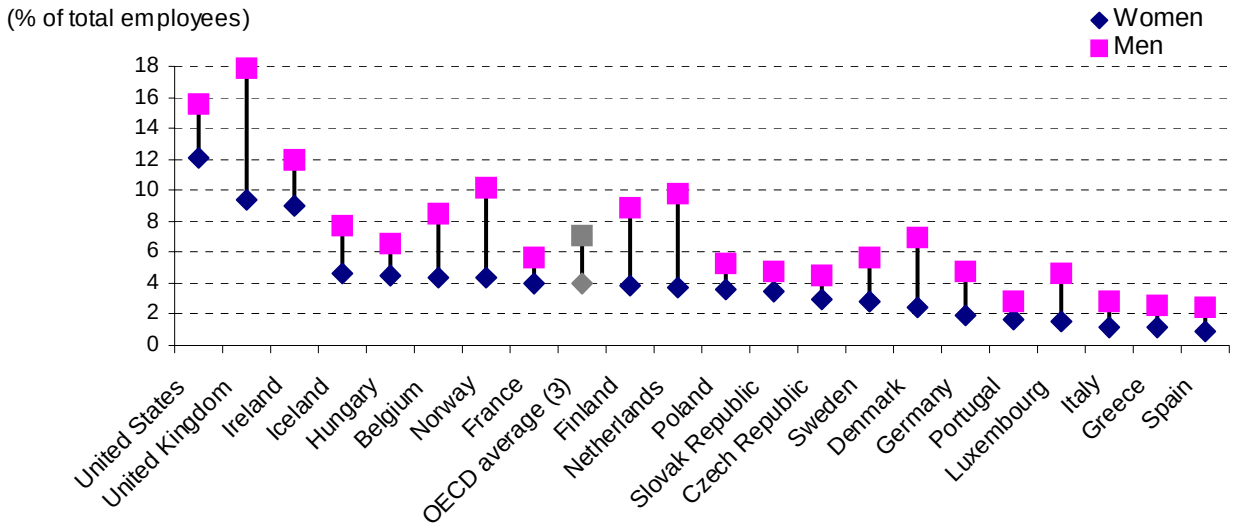
Next, a number of indicators of the gender gap are shown at various levels of occupational detail in order to put the gender gap in ICT-related employment into a wider context. Gender gaps are nuanced, and more pronounced, when looking at the various occupational levels. Men tend to dominate when looking at managerial types of occupations, but the share of women increases when looking at "professionals", which also includes life science and health professional as well as teaching professionals where women tend to account for a relatively large share. Women tend to account for a relatively small percentage of ICT specialists, but account for a larger share in occupations that use ICTs. However, this relatively larger share tends to come from larger shares in the office and clerical types of occupations and not necessarily the more highly skilled occupations.

Managerial and professional occupations

Managerial and professional employment rates of women vary greatly by country, and by occupations considered. Male employment rates in managerial occupations is higher than female employment rates in

all 21 OECD countries included in the graph, as well as for the OECD21 average (Figure 4). The share of women is greatest in the US, UK and Ireland, and the share is lowest in the Southern European countries. The difference between male and female rates is greatest in the UK, Norway, Netherlands and Finland.

Figure 4. Percentage of employees in managerial posts[1] in selected OECD countries, 2004[2]

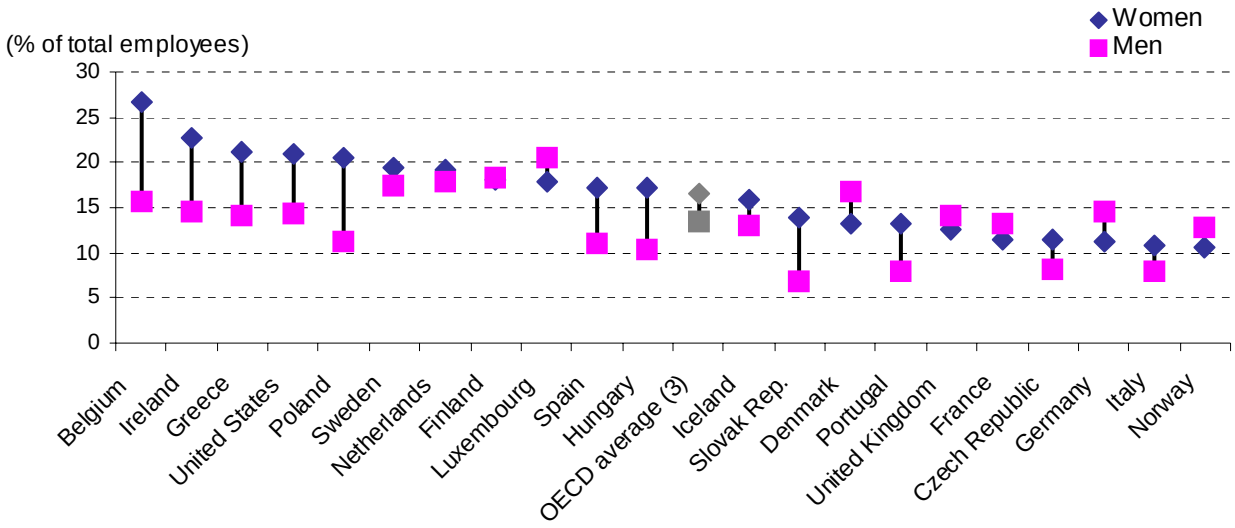


1. ISCO 88 category code: 120-123 and 130-131. (Detailed categories description available at: http://www.ilo.org/public/english/bureau/stat/isco/isco88/major.htm)
2. Or latest year available.
3. For the 21 available countries.

Source: *Women and Men in OECD Countries*, forthcoming OECD Brochure. Based on European Labour Force Survey and March 2004 Current Population Survey for the United States.

At the professional level this picture changes, with most countries showing higher female than male participation rates, except in Finland, Luxembourg, Denmark, the UK, France, Germany and Norway (Figure 5). The share is greater than 10% in all countries, and the share is greater than 20% in Belgium, Ireland, Greece, the US and Poland. This category includes some occupations where women traditionally tend to account for larger shares though, especially in the life science and health related occupations as well as teaching occupations. The difference between female and male rates is greatest in Belgium and Poland.

Figure 5. Percentage of employees in professional posts[1] in selected OECD countries, 2004[2]



1. ISCO 88 category code: 2 (professionals). It includes the following ISCO 88 categories: Physical, mathematical and engineering science professionals (I21), Life science and health professionals (22), Teaching professionals (23) and Other professionals (24).
2. Or latest year available.
3. For the 21 available countries.

Source: *Women and Men in OECD Countries*, forthcoming OECD Brochure. Based on European Labour Force Survey and March 2004 Current Population Survey for the United States.

This aggregated category of "professionals" hides some very sharp differences at the level of the occupations that it includes. For example, female participation in Canada within the "professionals" category tends to be very high (greater than 60%) in nursing and other health related occupation, clerical and administrative occupations, teaching, and social sciences and religion related occupations (Table 1). On the other hand natural sciences, engineering and mathematics professional occupations have the lowest share of women of any professional occupation, and these occupations include a large share of ICT-related professional occupations.

Table 1. Canada – evolution of the gender gap for selected occupations in Canada, 1987-2004.

Distribution of employment of women and men, by occupation, 1987, 1996 and 2004

	1987			1996			2004		
	Women	Men	Women as a percent of total employed in occupation	Women	Men	Women as a percent of total employed in occupation	Women	Men	Women as a percent of total employed in occupation
					%				
Managerial									
Senior management	0.3	0.8	21.1	0.3	0.7	27.3	0.3	1.0	22.1
Other management	5.7	9.8	30.7	7.9	10.9	37.6	6.7	9.8	37.7
Total management	6.0	10.6	30.1	8.2	11.6	37.1	7.0	10.8	36.6
Professional									
Business and finance	1.9	2.3	38.3	2.9	2.7	47.1	3.2	2.7	51.3
Natural sciences/engineering/mathematics	2.3	7.0	19.5	2.3	8.0	19.2	3.0	9.7	21.2
Social sciences/religion	4.3	2.0	61.5	6.1	2.3	69.2	6.2	2.2	71.6
Teaching	3.8	2.6	52.3	5.0	2.8	60.1	5.2	2.5	64.6
Doctors/dentists/other health	0.9	0.9	43.0	1.1	1.1	46.7	1.4	1.0	55.0
Nursing/therapy/other health-related	8.3	0.9	87.1	8.0	1.0	87.4	8.7	1.1	87.2
Artistic/literary/recreational	2.7	2.1	48.5	3.2	2.4	51.5	3.3	2.6	52.8
Total professional	24.1	17.9	50.4	28.4	20.2	54.0	31.0	21.8	55.6
Clerical and administrative	29.7	7.9	73.9	25.7	7.1	75.2	24.3	7.2	74.9
Sales and service	30.0	18.4	55.2	28.8	19.2	55.6	29.2	19.6	56.7
Primary	2.3	7.2	19.7	2.1	6.4	20.8	1.4	5.2	19.4
Trades, transport and construction	2.1	28.9	5.2	2.1	26.6	6.1	2.2	26.1	7.0
Processing, manufacturing and utilities	5.8	9.1	32.3	4.7	8.9	30.7	4.8	9.3	31.1
Total[1]	**100.0**	**100.0**	**43.0**	**100.0**	**100.0**	**45.4**	**100.0**	**100.0**	**46.8**
Total employed (000s)	**5,309.6**	**7,024.4**	--	**6,087.4**	**7,304.3**	--	**7,470.1**	**8,479.6**	--

1. Includes occupations that are not classified.

Source: Statistics Canada, Labour Force Survey.

Source: 'Women in Canada, A Gender-based Statistical Report', fifth Edition, Statistics Canada, March 2006, p.130. Available at: http://www.statcan.ca/english/freepub/89-503-XIE/0010589-503-XIE.pdf .ICT related occupations

This section looks at differences in male and female employment rates in ICT specialist occupations as well as in occupations that use ICTs intensively. This also gives some indication of where ICT skills can be found in employment. This is important as ICT skills are among the driving forces for technological development and growth. ICT skills are also one of the contributing factors to the dynamism of innovation. More generally ICT literacy and basic skills are increasingly becoming part of all aspects of modern life and are required to participate in many aspects of it (*e.g.* access to online services, such as health, government, education and leisure services). The analysis below looks initially at ICT-using occupations before focusing on a narrower measure of ICT specialist occupations.

ICT-using and ICT specialist occupations

Two definitions of ICT skilled employment are used (Box 1). In most countries, narrowly defined ICT skilled employment, which includes ICT specialists only, accounts for around 3-4% of total employment. Broadly defined ICT-skilled employment, which includes ICT specialists as well as those using ICTs intensively, accounts for around 20-30% (OECD, 2006b, Chapter 6).

Box 1. Defining ICT specialists and ICT users

Three categories of ICT competencies are distinguished. The first category corresponds to the narrow measure of ICT-skilled employment, and the sum of all three categories for the broad measure of ICT-skilled employment.

1. *ICT specialists,* who have the ability to develop, operate and maintain ICT systems. ICTs constitute the main part of their job.

2. *Advanced users*: competent users of advanced, and often sector-specific, software tools. ICTs are not the main job but a tool.

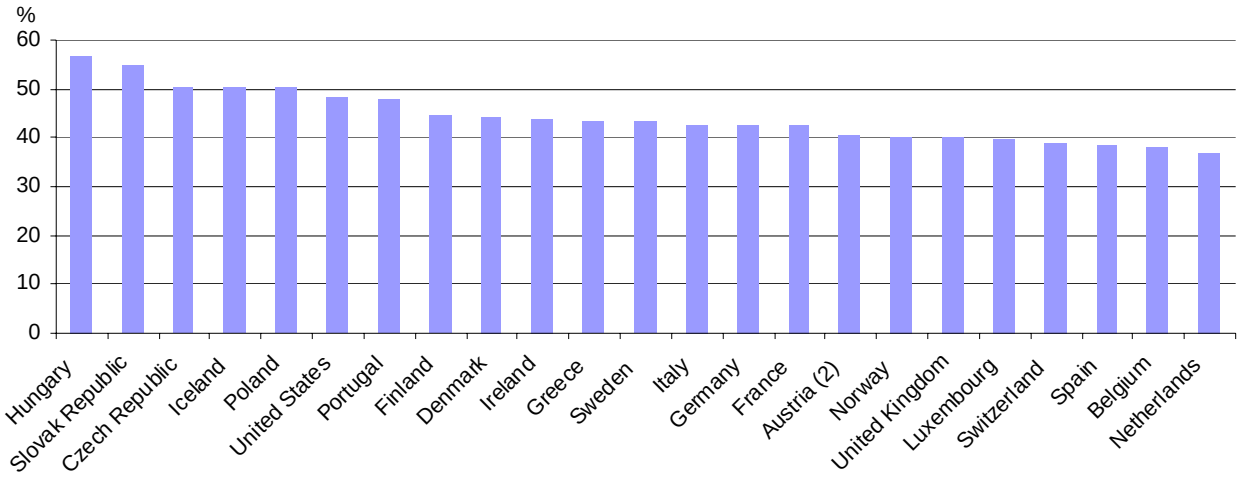
3. *Basic users*: competent users of generic tools (*e.g.* Word, Excel, Outlook, PowerPoint) needed for the information society, e-government and working life. Here too, ICTs are a tool, not the main job.

Thus, the first category covers those who supply the ICT tools (hardware and software), and the second and third categories those who use them. However, it appears that, increasingly, ICT specialists are expected to have ICT specialist and well as other skills, including "business" skills. Similarly, non-ICT related professions increasingly require at a minimum basic ICT user skills.

Source: OECD (2004a, 2006b), Chapter 6: ICT Skills and Employment.

The following figure looks at the presence of women in occupations that use ICTs. In most countries, women account for between 30% and 50% of employment in ICT-skilled employment according to the broad, ICT-using definition (Figure 6).

Figure 6. Share of women in ICT-using occupations[1], selected OECD countries, 2004



1. Broad definition based on methodology described in OECD (2004a, Chapter 6), van Welsum and Vickery (2005) and van Welsum and Reif (2006).
2. 2002.

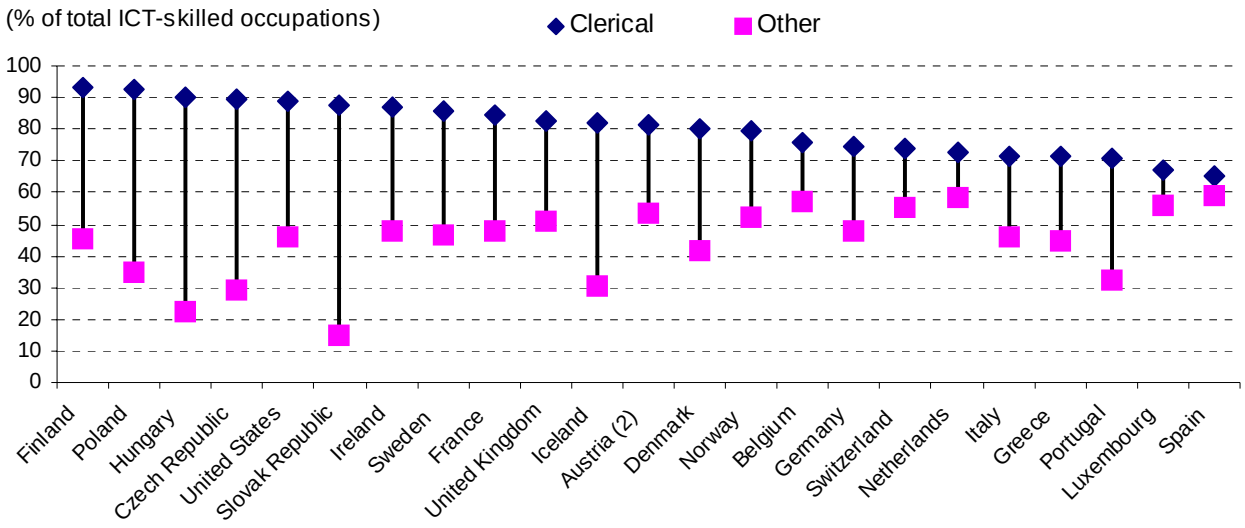
Source: OECD, based on data from EULFS and US Current Population Survey.

Again, this aggregate category hides important differences in female employment rates at the occupational level. The highest female employment rates occur in office or clerical type occupations[1]

1. Administrative, or clerical, ICT-using occupations in ISCO for this definition have been selected as: 343 – Administrative associate professionals, 411 – Secretaries and keyboard operating clerks, 412 – Numerical clerks, 422 – Client information clerks. For more information, see OECD (2004a, 2006b, Chapter 6), van Welsum and Vickery (2005) and van Welsum and Reif (2006).

(Figure 7), and the female rate is greater than 60% in all countries, and just over 90% in Finland and Poland. The male employment rates in these categories are comprised between 10% and 60%. The difference between female and male employment rates is greatest in Slovak Republic and Hungary.

Figure 7. Share of women in ICT-using occupations[1] with detail for clerical occupations, selected OECD countries, 2004

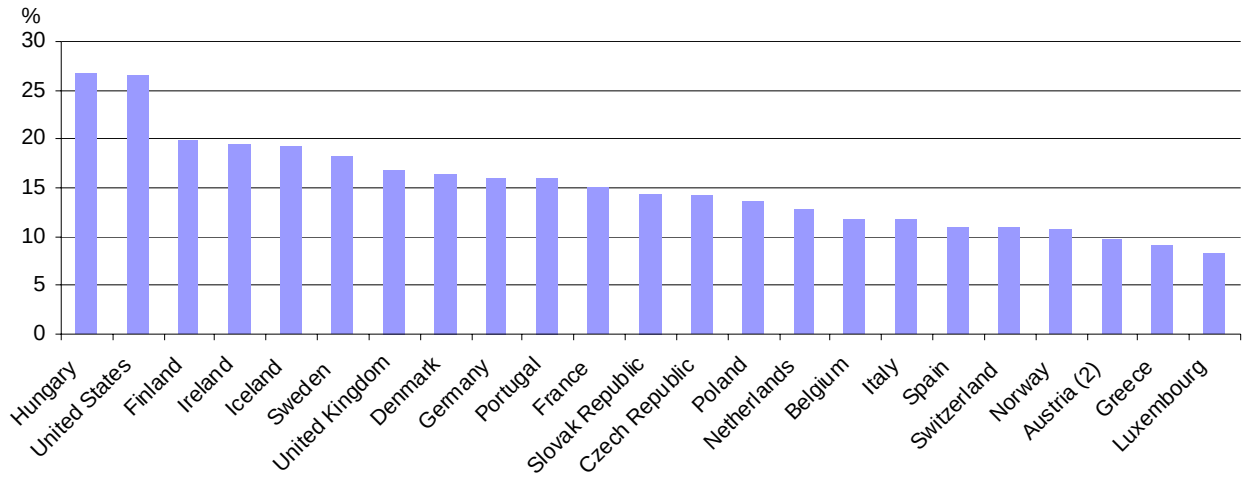


1. Broad definition based on methodology described in OECD (2004a, Chapter 6), van Welsum and Vickery (2005) and van Welsum and Reif (2006).
2. 2003 instead of 2004.

Source: OECD, based on EULFS and US Current Population Survey.

Female employment rates in the narrow definition of ICT-skilled employment, i.e. ICT specialists, is very low, between 10% and 20% in all countries considered, except for Hungary and the US where it is just over 25%, and in Austria, Greece and Luxembourg where it is less than 10% (Figure 8). ICT specialist occupations tend to have a rather negative image, often seen as too technical or "nerdy". Relatively few women choose to study computing sciences, so there are not many women in "the pipeline" to ICT specialist occupations. However, it has also been suggested that the pipeline may be "leaking" and that even those who do graduate with computing degrees choose to work elsewhere.

Figure 8. Share of women in ICT specialist occupations[1], selected OECD countries, 2004

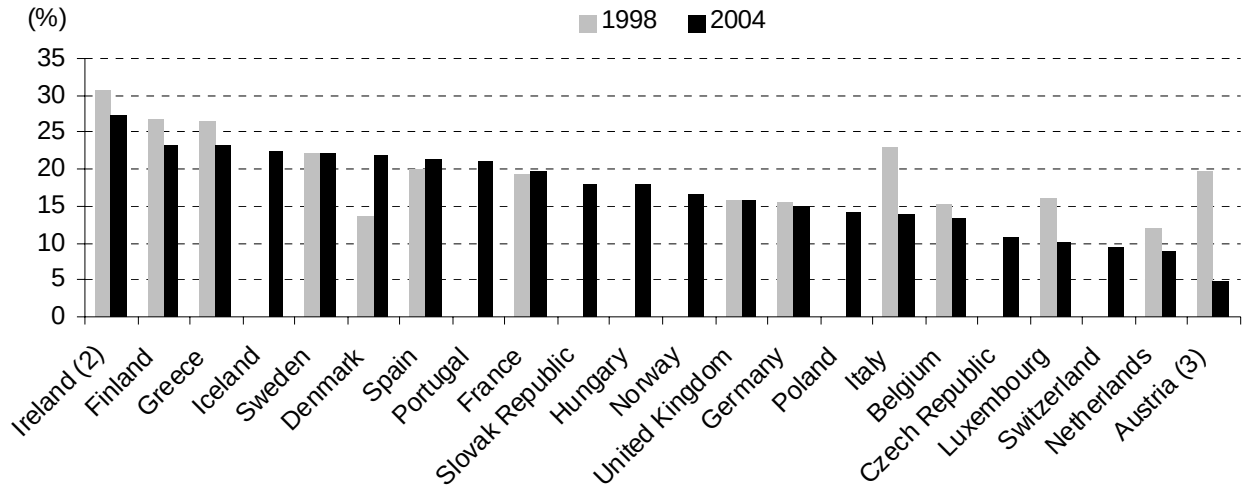


1. Narrow definition based on methodology described in OECD (2004a, Chapter 6), van Welsum and Vickery (2005) and van Welsum and Reif (2006).
2. 2002.

Source: OECD, based on EULFS and US Current Population Survey.

Within the category of ICT specialists, or narrowly defined ICT skilled employment, the share of women computing professionals is shown in Figure 9. In 2004, the share is less than 25% in most countries (except in Ireland), and less than 10% in Luxembourg, Switzerland, Netherlands and Austria. In most countries included in the graph, the share of women among computing professionals has either decreased or stagnated between 1998 and 2004. This confirms reports of falling shares of women in IT, but not in the UK where the share remained constant (and even increased slightly when looking at computing professional and associate professionals, Appendix Figure 1), contrary to what has been reported for a wider category of IT employment in the UK, which included also the more low skill – low pay type of IT occupations (Financial Times, 2006). The share increased in Denmark, Spain and France.

Figure 9. Share of women computing professionals[1], selected OECD countries, 1998 and 2004



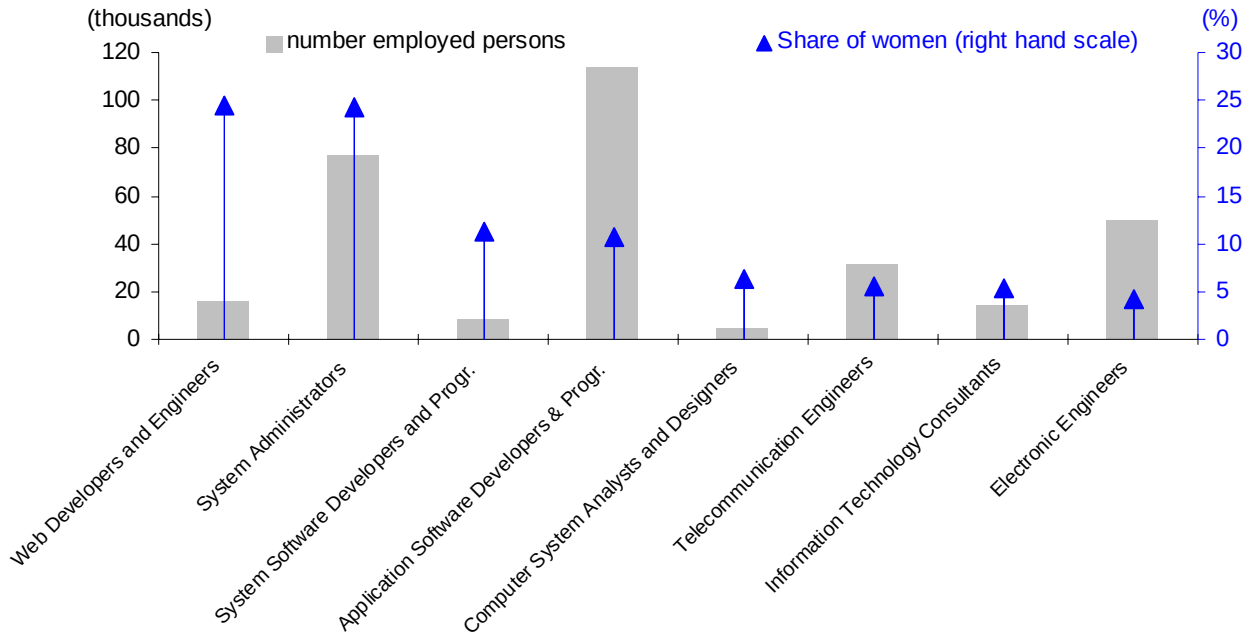
1. Computing professionals = ISCO 213.
2. 1999 instead of 1998.
3. 2003 instead of 2004.

Source: OECD, based on data from Eurostat, Newcronos database, 2006.

The share of women in the sum of the categories computing professionals and computing associate professionals for selected OECD and non-OECD countries is shown in Appendix Figures 1and 2. Even though there may be some comparability problems with the data, it would appear that the share of women in these ICT specialist type of occupations may be somewhat higher in the non-OECD member countries which data are available than for most OECD countries. In most countries the share of women is higher when looking at computing professionals alone (Figure 9) rather than at the sum of computing professional and computing associate professionals (Appendix Figure 1). This is not the case, however, in Finland, Czech Republic, Hungary, Poland, and Slovak Republic

Even though the data are not strictly comparable and the occupations are not exactly the same, in Korea in most ICT specialist type of occupations, women's share is less than 20%, less than 30% in the case of system administrators and web developer and engineers (Figure 10). The lowest share of women is observed for the category "electronic engineers".

Figure 10. Share of women in selected ICT specialist occupations[1], Korea, 2003



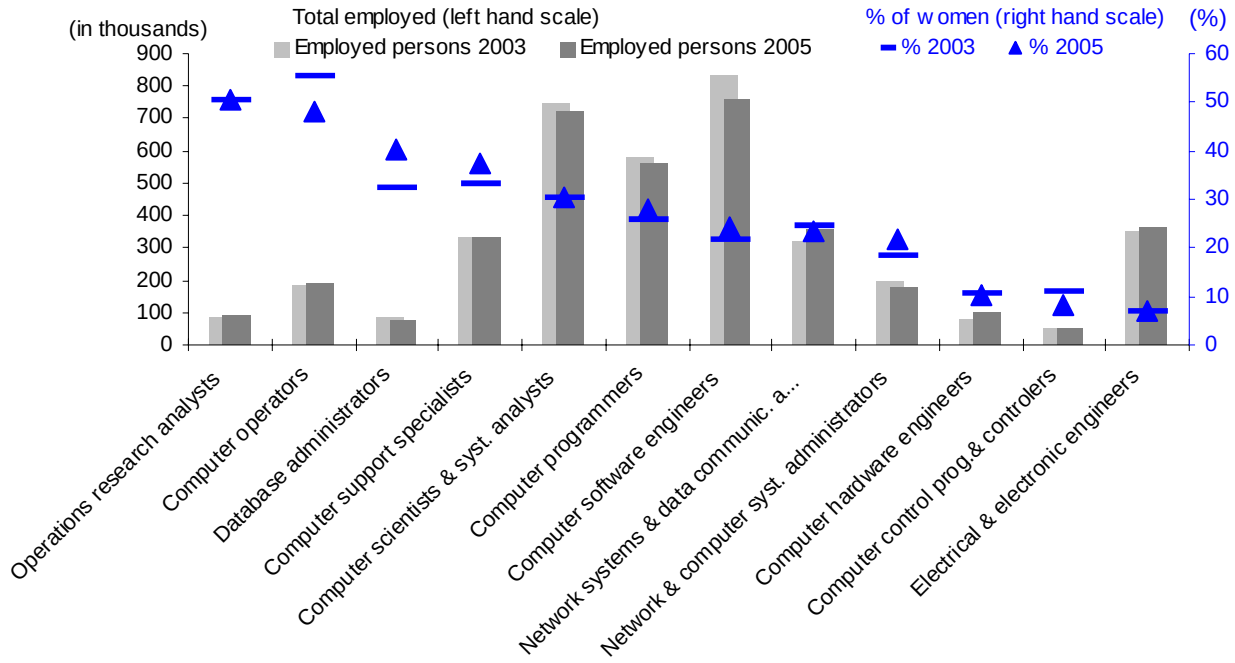
1. Selected ICT occupations within the narrow definition. The selected occupations account for about 70% of the total ICT occupations, narrow definition.

Source: OECD, based on data from the Korean Work Information Center, Human Resource Development Service.

In the United States in 2005, the share of women in ICT specialists type of occupations ranges from 7% to 50%. Hardware, electrical and electronic engineers, telecommunication and electronic engineers- have very low feminization rate (less than 15%). Only one fourth of software engineers and programmers are women (Figure 11).

The share of women in some IT professional categories increased between 2003 and 2005 (*e.g.* database administrators, computer support specialists, and computer software engineers), although some of these changes might hide transfers between categories. On the other hand, among IT technical occupations (such as computer operators), the share of female computer operators declined sharply.

Figure 11. Share of women in selected ICT specialist occupations[1], United States, 2003-2005



1. Selected ICT occupations within the narrow definition. The selected occupations account for about 80% of the total ICT occupations, narrow definition.

Source: OECD, based on data from the US Bureau of Labor Statistics.

In Canada in 2001 there was also a wide range of feminization rates in ICT specialist type of occupations, ranging from around 15% in computer engineers to around 42% in database analysts and data administrators (Table 2). The percentage of women in IT occupations was also considerable lower than that for all occupations (27% compared to 46.9%, respectively).

Table 2. Women in IT specialists[1] occupations in Canada, 2001

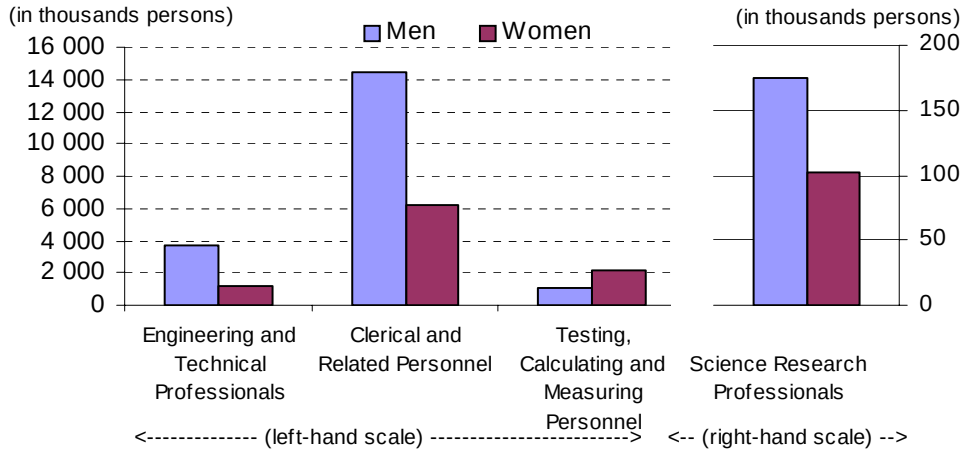
	Total	Women
	'000	%
All occupations	**14,695.1**	**46.9**
Natural and applied sciences and related occupations	957.1	21.4
Professional	525.4	22.2
Technical	431.7	20.3
IT occupations	**387.5**	**27.0**
Professional		
Computer engineers (except software)	26.8	14.4
Information systems analysts and consultants	103.1	31.2
Database analysts and data administrators	13.6	41.5
Software engineers	25.9	17.7
Computer programmers and interactive media developers	96.6	23.2
Web designers and developers	22.2	33.1
Technical		
Computer and network operators and web technicians	45.8	25.2
User support technicians	47.0	31.0
Systems testing technicians	6.6	40.7

1. Occupations in IT collected from the 2001 Census, and using the National Occupational Classification for Statistics, 2001.

Source: 2001 Census of Canada, as provided by Habtu (2003).

Data on the number of men and women in selected occupations in China are shown in Figure 12. Contrary to what has been observed for OECD countries (Figure 7), and even though the data are not strictly comparable, there are relatively more men than women in clerical and related personnel in China. There are more women than men in "testing, calculating and measuring personnel" in China. Like in OECD countries, there are in China more men than women in "engineering and technical professionals" and "science research professionals".

Figure 12. Gender gap for selected occupations in China, 2000[1]



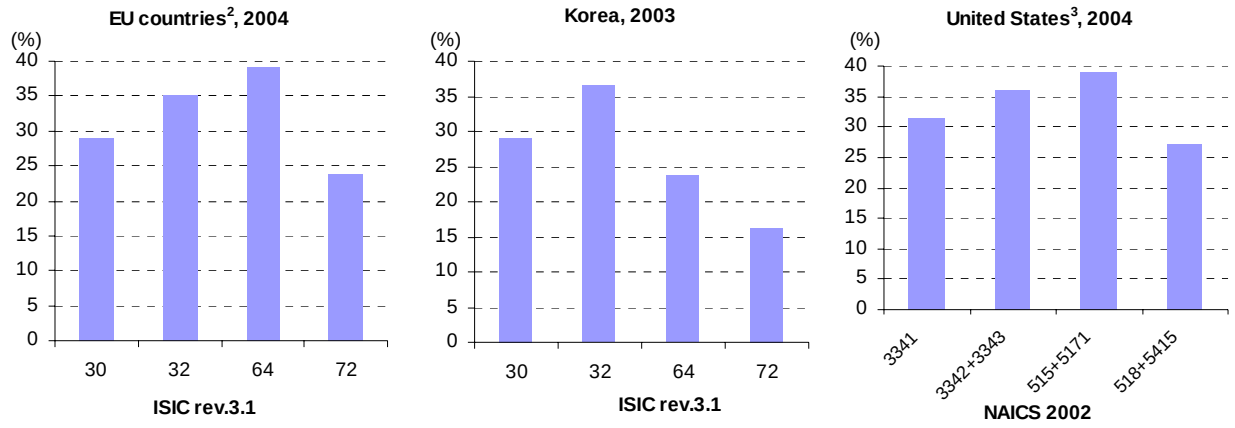
1. Based on National Standard Classification of Occupations.
Source: OECD, based on data from ILO (http://laborsta.ilo.org/).

Share of women in ICT-sector employment

Whereas the previous indicators have all looked at employment in various types of occupations, the next set of indicators looks at the share of women employed in the ICT sector.[2] Employment in the ICT sector is dominated by men, the share of women ranging between 15% and 40%. The female employment share is lower in "Computer and related activities services" (ISIC 72 or NAICS 518+5415) than in other ICT industries, not only in Korea and the US, but also in the EU countries (except Netherlands, Germany, Greece and Norway (Figure 13). It would appear that the ICT sector has problems not only attracting women, but also retaining them. It has been suggested that the business climate may be an important factor, with the technical parts of ICT companies having a relatively poor image, often seen as "nerdy", male dominated and sexist.

Detailed data for the US (not in the graph) show that the female employment share again varies also at a more disaggregated level of the ICT service industry, with around 25% in '*Computer systems design and related services' (NAICS 518)*, and almost 50% in '*Data processing, hosting, and related services' (NAICS 5415)*.

Figure 13. Share of women in selected ICT industries[1] in selected OECD countries, 2004



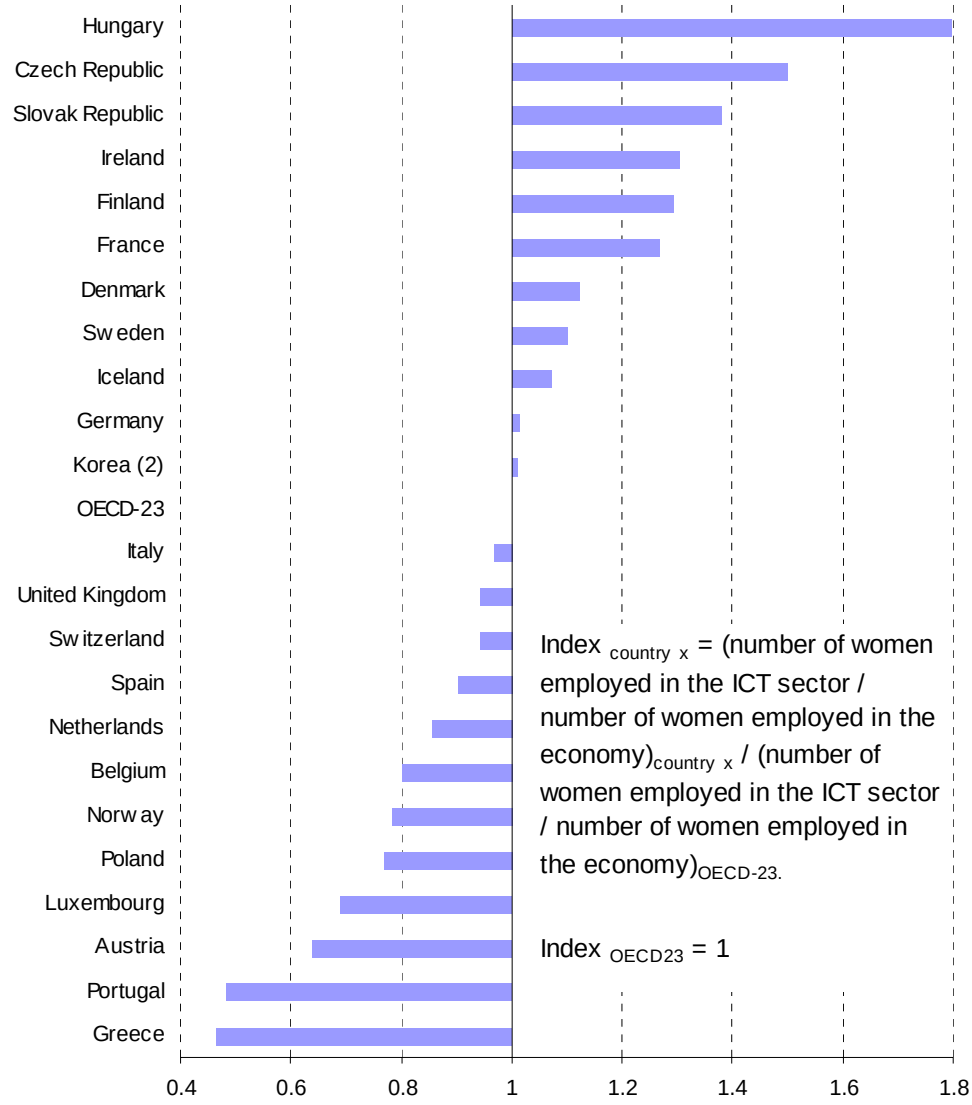
1. ISIC Rev. 3.1 selected categories include: ISIC 30 (Manufacture of office, accounting and computing machinery); ISIC 32 (Manufacture of radio, television and communication equipment and apparatus); ISIC64 (Post and telecommunications), which also includes Postal activities; and ISIC 72 (Computer and related activities).
2. EU countries include: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Spain, Slovak Republic, Sweden, Switzerland, and the United Kingdom.
3. For the United States, the selected NAICS codes do not cover ICT sector as a whole. They include: Computer and peripheral equipment (NAICS 3341), Communications, audio, and video equipment (NAICS 3342 and 3343), Radio and television broadcasting and cable (NAICS 515), Wired telecommunications carriers (NAICS 5171), Internet service providers and Data processing, hosting, and related services (NAICS 518), and Computer systems design and related services (NAICS 5415).

Source: OECD, based on EULFS, US Bureau of Labour Statistics, and Korean Work Information Center, Human Resource Development Service.

2. Employment in the ICT sector also includes non-ICT-related occupations. ICT-related occupations can be "employed" in all sectors.

1. The relative feminization rate index[3] for the ICT sector shows that some of the Eastern European countries (Hungary, Czech Republic and Slovak Republic), most of the Nordic countries (Finland, Denmark, Sweden and Iceland), Ireland and France are relatively ahead compared to other OECD countries (Figure 14). Nevertheless, even in those countries the female employment share in the ICT sector is relatively low, ranging from around 30% to 45%.

Figure 14. ICT sector relative feminization index for selected OECD countries, 2004[1]



1. ICT sector defined as the sum of the ISIC Rev3.1. sector 30, 32, 64 and 72.
2. 2003 data have been used for Korea.

Source: OECD, based on EULFS, and Korean Work Information Center, Human Resource Development Service.

3 . Calculated as: Index country x = (number of women employed in the ICT sector / number of women employed in the economy)country x / (number of women employed in the ICT sector / number of women employed in the economy)OECD-23. Index OECD23 = 1

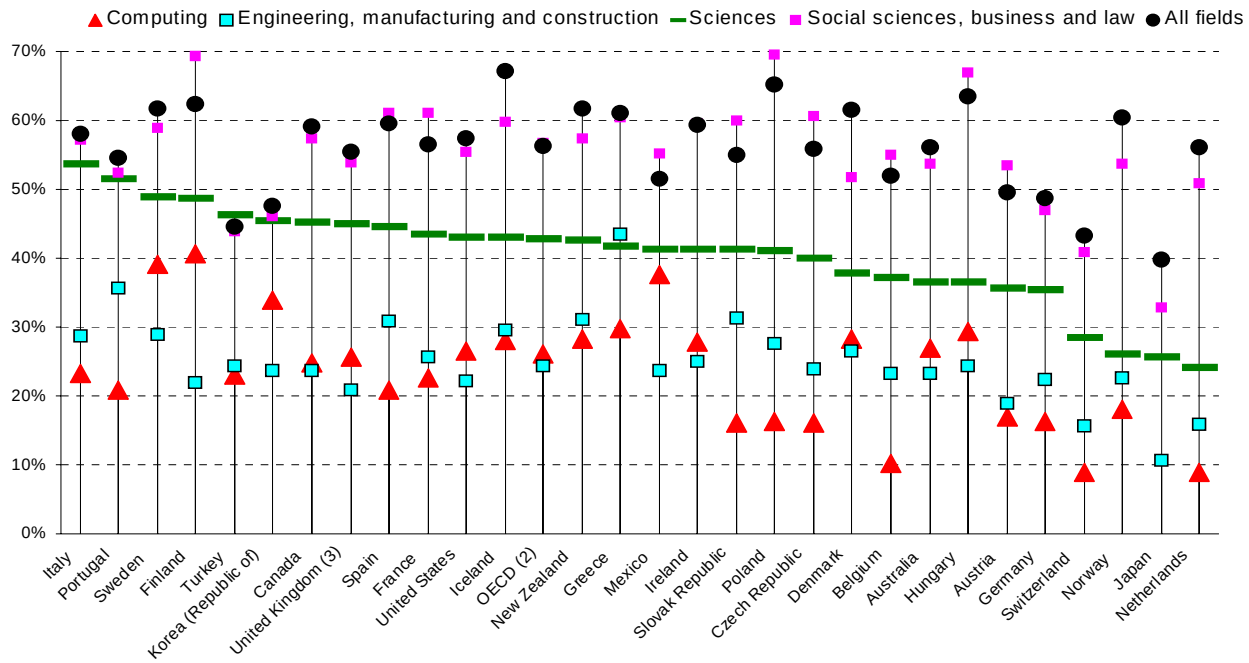
Education and training

While the previous section looked at indicators of female employment rates in ICT-related occupations, i.e. those who already have ICT skills, this section looks at the share of women among those obtaining ICT skills, in particular through education and training. While other, more informal, ways of obtaining skills, especially the more basic skills, *e.g.* through self-study from books or through the help of a friend, can also be important, these are not considered here. This section looks at the share of women in science and technology related degrees, and computing related fields of education in particular, as well as the participation of women in computer related training courses.

Women tend to be relatively underrepresented in computing sciences. It has been suggested that this may be due to the poor image IT professional occupations have. Several countries have initiatives aimed at creating a more positive image, starting to target girls early on at school age. Indeed, the choices made in school will affect the degrees open for choice by the time they get to tertiary education. If mathematics were not a subject chosen in school it is unlikely a study to become a computer engineer is possible.

The relative lack of interest girls show in studying computing science is illustrated in Figure 15. In most countries, female participation in computing is lower in science related fields of study than in all fields of study and in social sciences and than in more aggregated science categories. The share of women in computing related degrees ranges from just under 10% (Belgium, Switzerland and the Netherlands) to about 30% in most countries, except in Sweden, Finland, Korea, and Mexico where it ranges between 30% and 40%.

Figure 15. Women's share in selected fields of education, 2004[1,2]

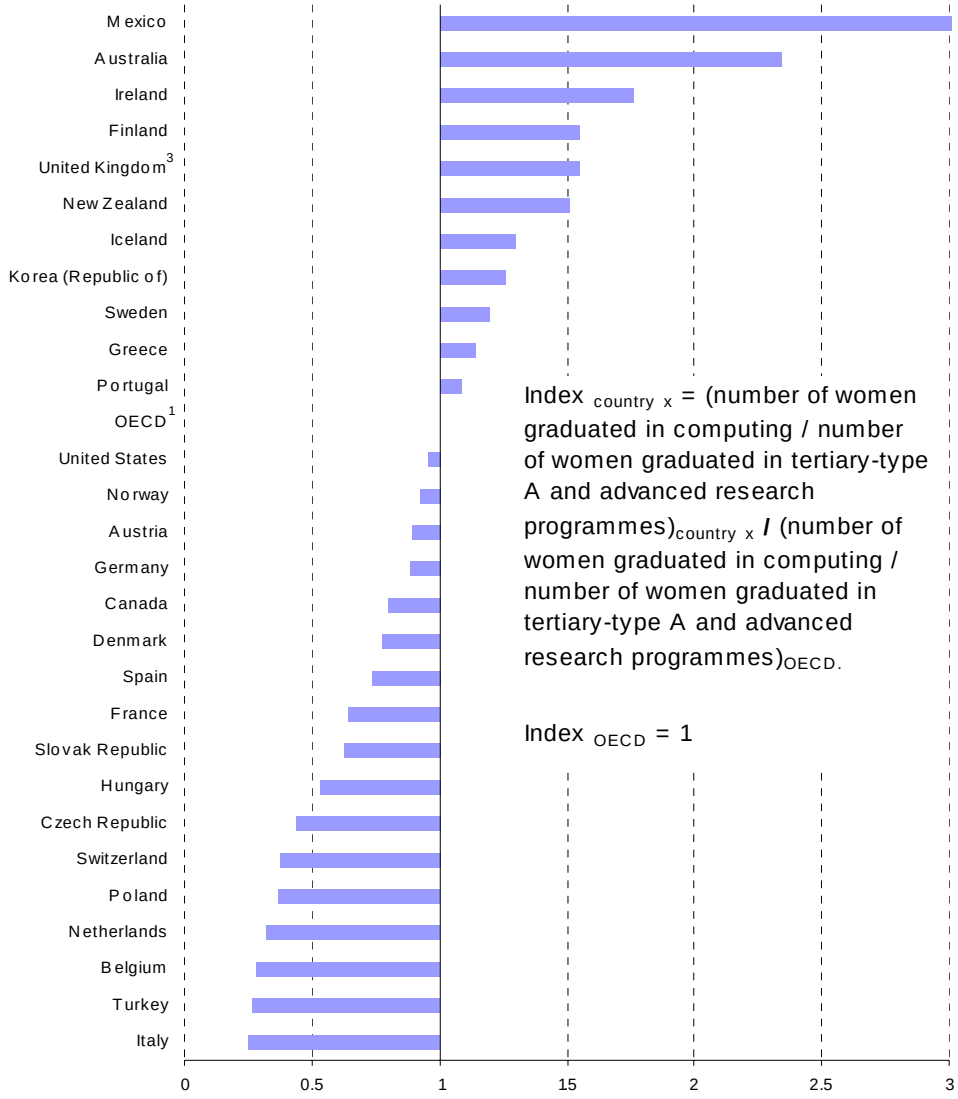


1. Share of women in graduates in Tertiary-type A and advanced research programs for the following fields of education : All fields; Social sciences, business and law (ISCED 300); Science (ISECD 400); of which : computing (ISCED 48); Engineering, manufacturing and construction (ISCED 500).
2. Japan and Luxembourg not available.
3. 2003 for United Kingdom.

Source: OECD, based on data from the Education database.

The index of relative specialization of women in computing fields of study[4] shows that relatively more women in Mexico and Australia in particular choose computing as a field of study compared to women in the OECD as a whole (Figure 16). This is also true, but to a lesser extent, for other English speaking countries (except the US), Ireland, the UK and New Zealand, as well as Finland. Countries where relatively fewer women go into computing studies include Italy, Turkey, Belgium, Netherlands, Poland, Switzerland and Czech Republic.

Figure 16. Fields of studies: Women relative specialization in Computing index, 2004[1,2]



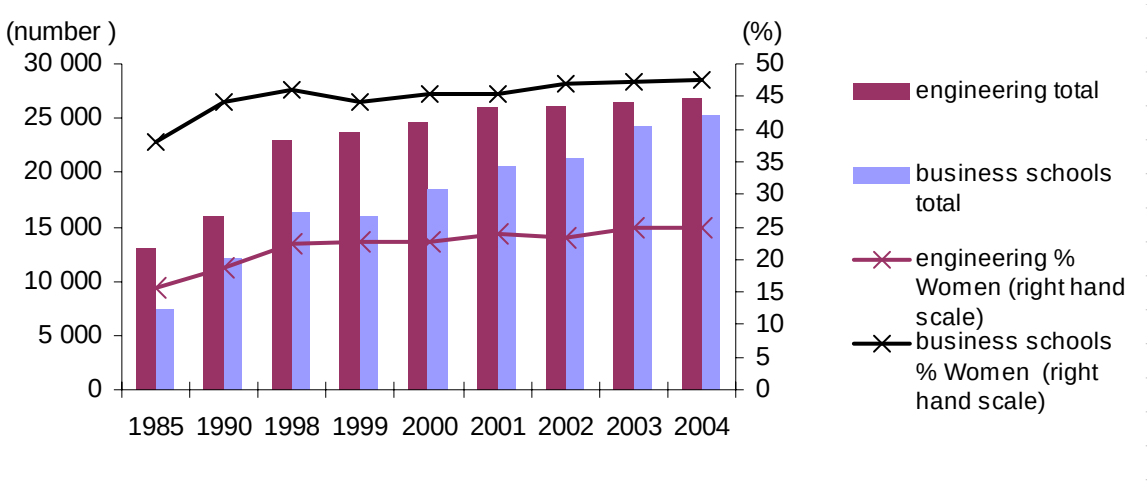
1. Fields of studies among tertiary-type A and advanced research programs.
2. Japan and Luxembourg not available.
3. 2003 for United Kingdom.

Source: OECD, based on data from the Education database.

4 . Calculated as: Index country x = (number of women graduated in computing / number of women graduated in tertiary-type A and advanced research programmes)country x / (number of women graduated in computing / number of women graduated in tertiary-type A and advanced research programmes)OECD. Index OECD = 1.

Looking at the diplomas awarded in the French "Grandes Ecoles" (tertiary education), there appears to be a more or less constant gap between the share of women graduates in business schools and those graduating from schools specializing in engineering related fields of study from 1985 until 2004 (Figure 17). By 2004, the share of female business school graduates was close to 50% compared to only 25% in engineering schools.

Figure 17. Share of women graduates in French tertiary education "higher schools"[1], 1985-2004

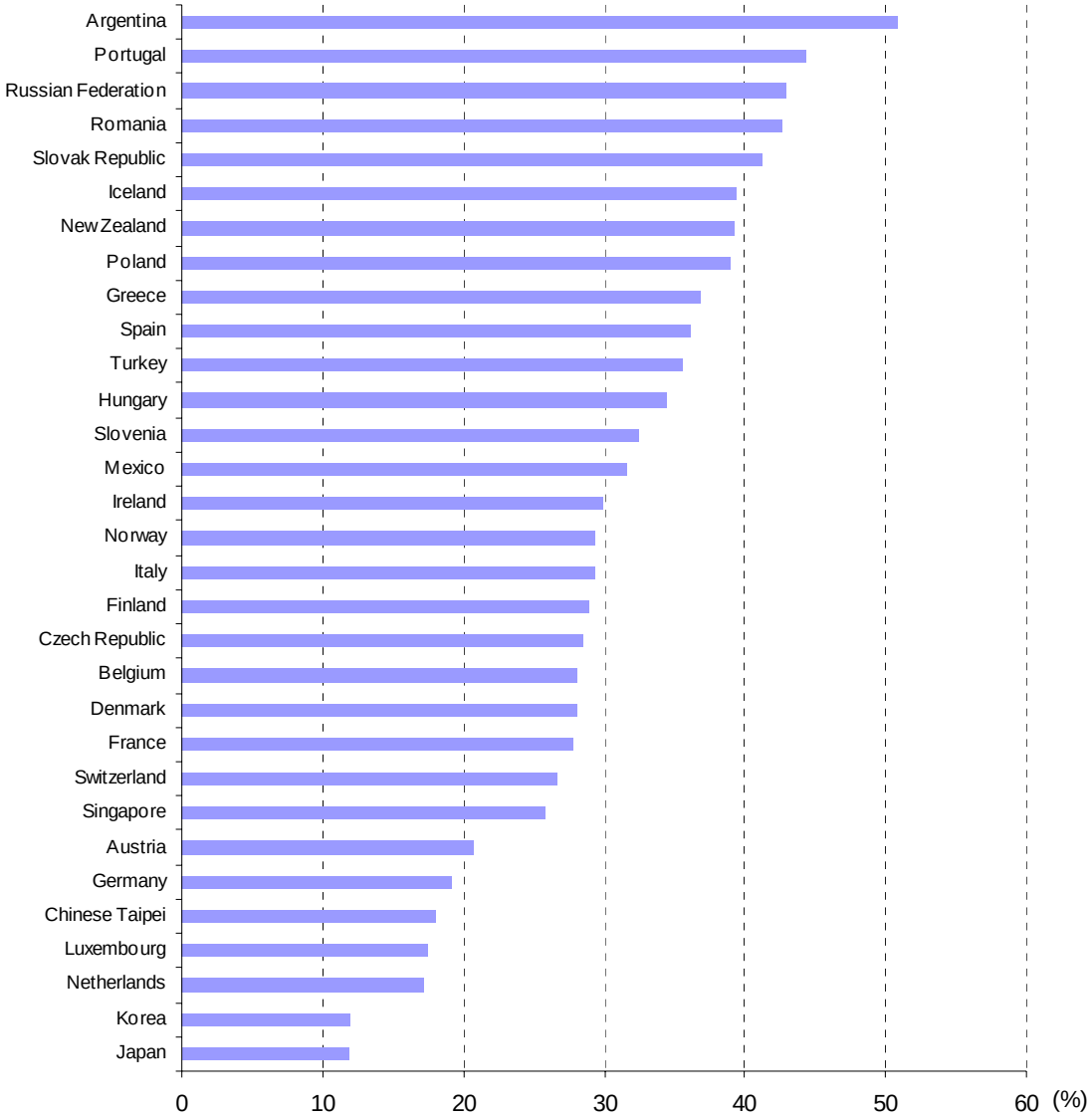


1. Grandes Ecoles.

Source: Ministère de l'Education Nationale, de l'Enseignement Supérieur et de la Recherche, *Repères et références statistiques*, édition 2006, Chapter 8. Available at: http://media.education.gouv.fr/file/43/4/2434.pdf

Researchers are key players for the dynamics of innovation and competitiveness, including in ICT-related fields. Although internationally comparable data are not available by gender by detailed fields of research, the broader picture shows again a significant gender gap. Women researchers account for 20% to 40% of total researchers in most OECD countries (Figure 18). The share in Japan and Korea is much lower though, less than 15%. Several factors have been underlined to explain the relatively low numbers of female researchers in Japan. First, family responsibilities, second, it has been suggested there are fewer jobs opportunities for female researchers, and finally, a small number of female students majoring in sciences areas. A lack of female role models in science contributes to this. The few existing role models for scientists and engineers in Japan are in the public sector, not in the private sector (Ogawa, 2006). These points are true, to varying extents, for other countries too. Data, where available, have also been included for some selected non-OECD countries.

Figure 18. Women researchers as a percentage of total researchers (headcount), 2004[1,2]



1. Or most recent year.
2. 2003 for Belgium, Denmark, France, Germany, Greece, Iceland, Italy, Luxembourg, Mexico, Netherlands, Norway and Portugal. 2002 for Austria and Turkey. 2001 for New Zealand.

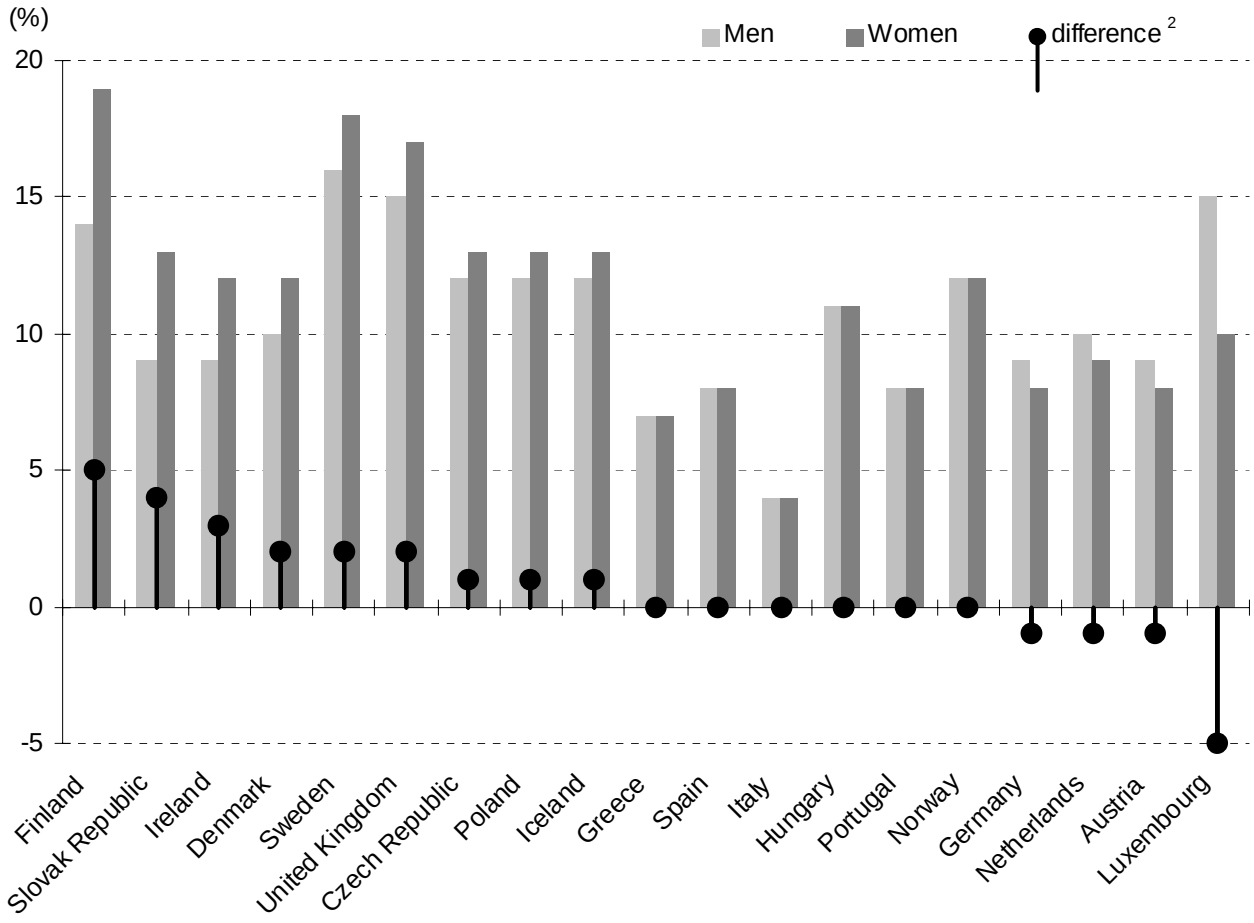
Source: OECD, OECD Main Science and Technology Indicators, June 2006.

Computer courses

Looking at those who have taken computer courses, female participation exceeds male participation in quite a few countries, including Finland, Slovak Republic and Ireland. However, in Luxembourg, Austria, Netherlands, and Germany, there were more men than women taking computing courses. Female participation rates are highest in Finland, Sweden and the UK (greater than 15%), and lowest in Italy (less than 5%). Although data are not shown here, participation rates in computer courses tend to increase with the level of education, except in Czech Republic and Poland. Gender gaps tend to decrease with the level of education (Figure 19).

Figure 19. Gender gap in computer courses in selected OECD countries, 2005

Percentages of individuals who have taken a computer course in the last 12 months[1]



1. Percentage of individuals ages between 16 and 74.
2. Difference calculated as percentage of women minus percentage of men, in percentage points.

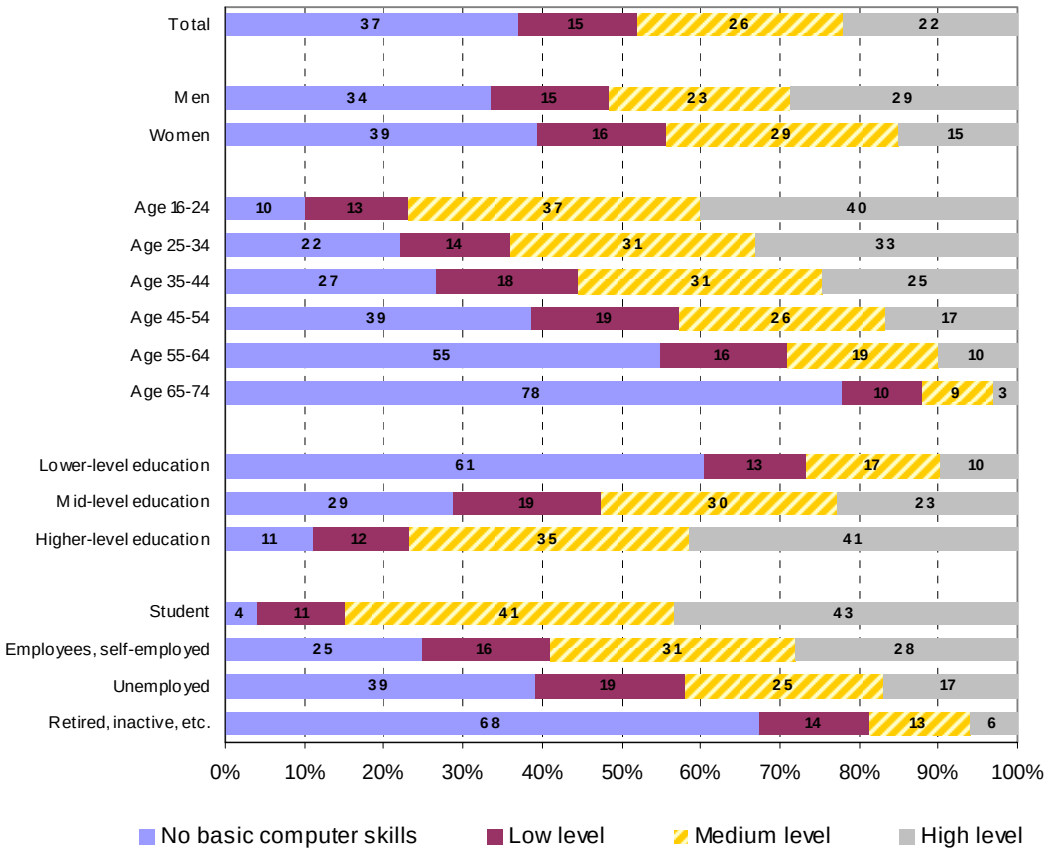
Source: OECD, based on data from Eurostat, Newcronos database, 2006.

Digital literacy

When looking at basic computer and Internet skills (measured using a self-assessment approach) the differences are much less pronounced by gender than by other criteria, including age group, educational level and employment status. Thus, 39% of women claim to have no basic computer skills, compared to 34% of men. On the other hand, 29% of men claim to have high level computer skills, compared to only 15% of women (Figure 20).

Figure 20. Individuals' level of basic computer skills, EU25, 2005

(as a percentage of the total number of individuals aged 16 to 74)



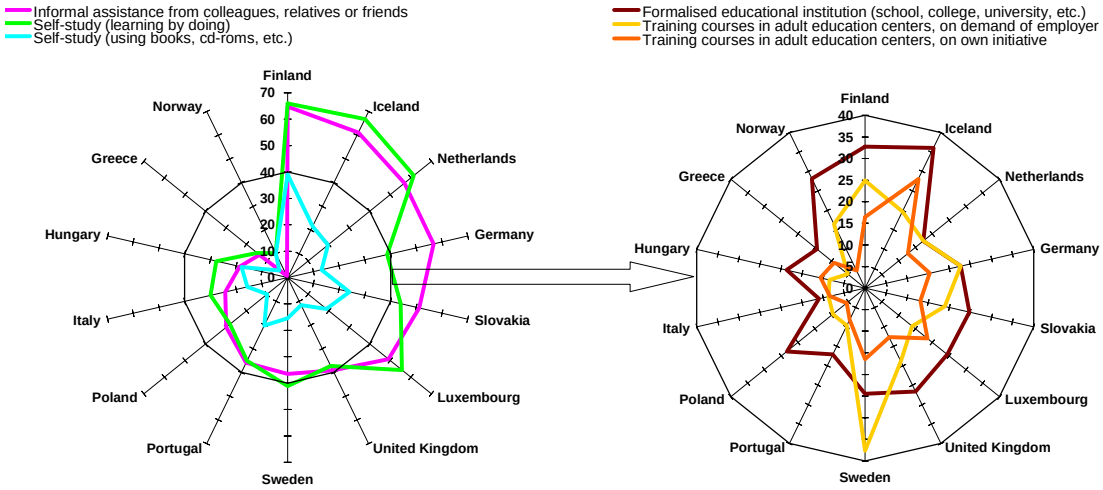
Source: Eurostat, Community survey on ICT usage in households and by individuals, as quoted in Demunter (2006).

Ways of acquiring computer skills

Although there are considerable variations across countries, in the 14 countries where information on ways of acquiring computer skills has been collected, women tend to acquire their computer skills primarily from informal assistance from colleagues, relatives or friends or from learning-by-doing. However, the use of books or CD-ROMS in self-study is relatively less frequent (Figure 21 – left-hand side panel). Courses in formalised educational institutions are also an important source of skills, as are formal training courses in adult education centres at the request of an employer. It is relatively less frequent that these courses are undertaken on women students' own initiative (Figure 21 – right-hand side panel). From these data there appears to be relatively little consistent differences across countries between women and men in the ways that they acquire computer skills, except that women appear to be engaged in formal study in educational institutions somewhat more than men in a small majority of countries (8 out of 14), and men to engage in self-study (learning by doing, using books, CD-ROMs, etc.) more than women in all countries for which data is available, and to receive informal assistance from colleagues more than women in a small majority of countries (9 out of 14).

Figure 21. Sources of acquiring computer skills for women in selected OECD countries, 2005

(as a percentage of the total number of women aged 16 to 74)

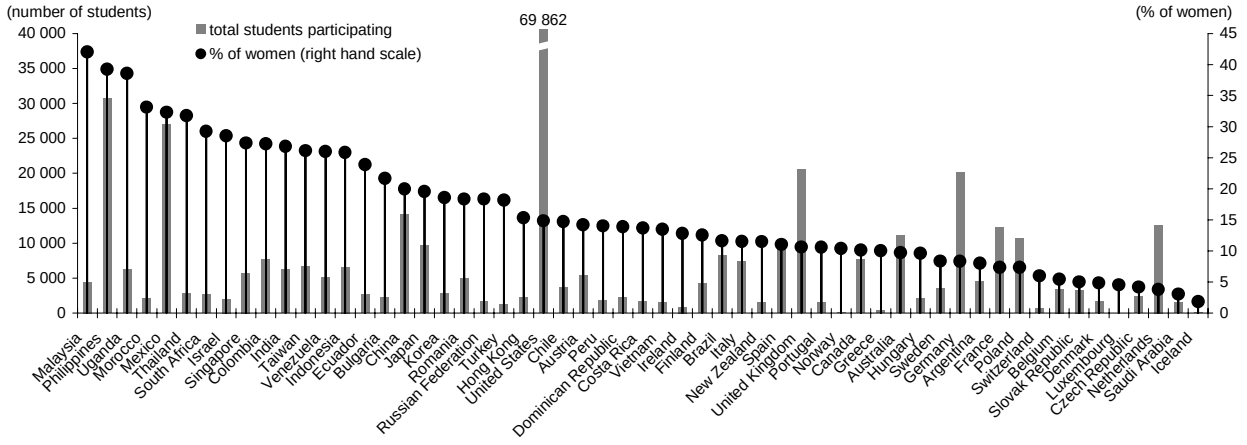


Source: OECD, based on data from Eurostat, Newcronos database, 2006.

Vendor training

One way of acquiring ICT skills is through formalized courses set up by ICT vendors (*e.g.* Microsoft, SAP, Cisco). Vendor certification courses provide widely recognized ICT skills specializations, facilitating access to a range of jobs to those qualified. Nevertheless, an example from such a vendor certification course shows that they are dominated by men (women accounting for less than 45% in all countries included in the example; Figure 22).

Figure 22. Example of ICT certification course[1] attendance, 2006



1. Based on data provided by a private sector firm, as of July 2006. Countries where the number of students is below 1 000 are not shown.

Source: OECD, based on data provided by a private sector firm.

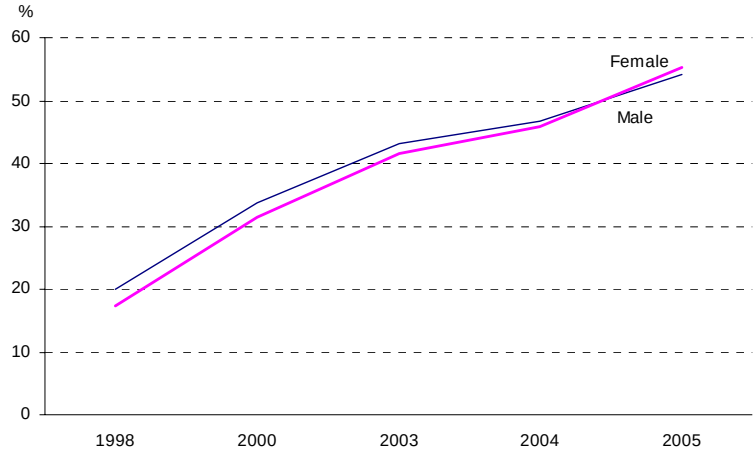
Access to ICTs by gender

Many factors impact women's access and use of ICTs, including the ICT infrastructures, social norms, time budget allocation, education, employment, and available content and cultural constraints. This section looks at some of them.[5]

Access to PCs

PC access has become widespread among most of OECD countries (OECD, 2004a, Chapter 4). Nevertheless, some differences in access remain even in 2005. In terms of access from home, the gender gap is slowly evolving. The evolution of the gender access gap for Ireland and the US is shown in Figures 23 and 24. Computer usage figures mirror those for access. Computer usage (within the last 12 months) in OECD countries in 2005 still ranges from around 20% to close to 90% of individuals. Gender differences (female – male) range from +4 to -18 percentage points.

Figure 23. Presence of Home computer[1] in Ireland, 1998-2005



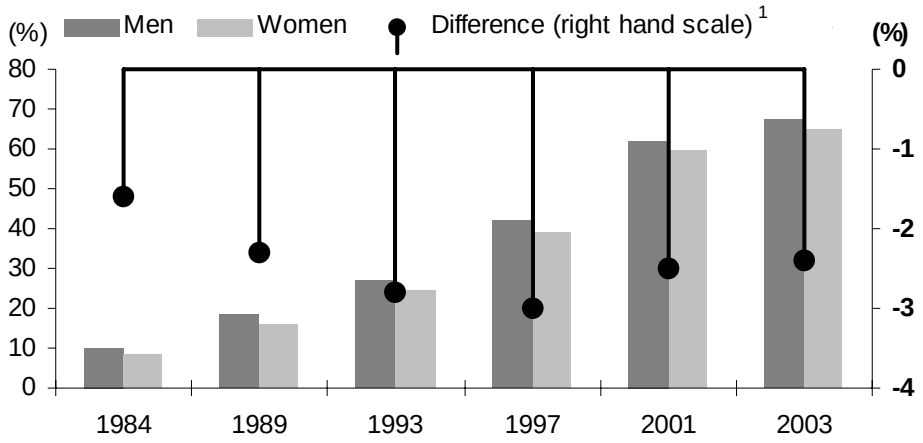
1. Percentage of households with a computer permanently in dwellings.

Source: Central Statistics Office Ireland, *Information Society and Telecommunications 2005*. Available at: http://www.cso.ie/releasespublications/documents/industry/2005/ictireland2005.pdf

5. In this section, unless otherwise stated, indicators for access and use PC and Internet indicators are for individuals, from any place.

Figure 24. Presence of computer at home in the United States, 1984-2003

(Percentage of adults aged 18 years and more)

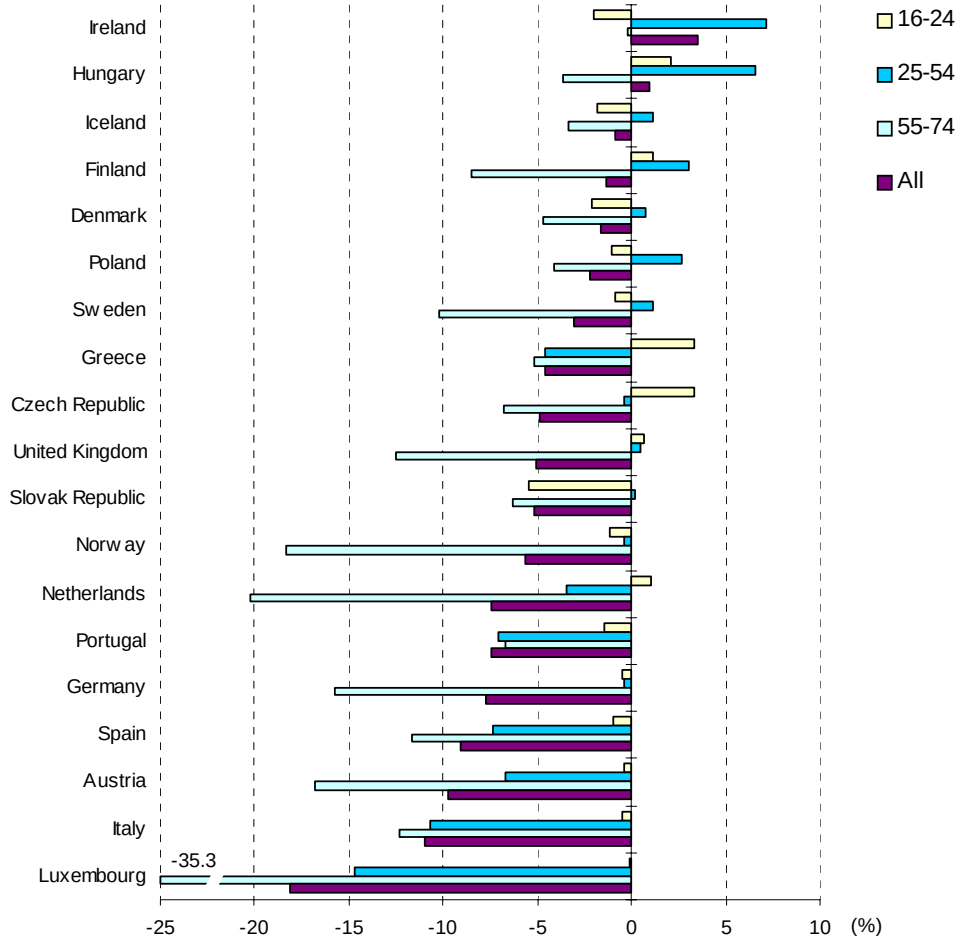


1. Difference calculated as percentage of women minus percentage of men, in percentage points.

Source: OECD, based on data from the US Bureau of the Census.

These gender differences in computer usage appear to be increase with age. As shown in Figure 23 below, the spread of gender gaps (maximum gap minus minimum gap) varies from around 9 percentage points for the 16-24 years old category to 35 percentage points for the 55-74 years old category. The youngest generation has grown up with the Internet age and is clearly accustomed to using a PC. At least 60% of the 16-24 have used a PC within the last 12 months (in the lowest case), but this share falls to only 6% for the 55-74. In several countries, the share of women using a PC is clearly ahead that of men in the youngest generation.

Figure 25. Gender differences[1] in computer use[2] in 2005, selected OECD countries



1. Difference calculated as percentage of women minus percentage of men, in percentage points.
2. Computer used in the last 12 months.

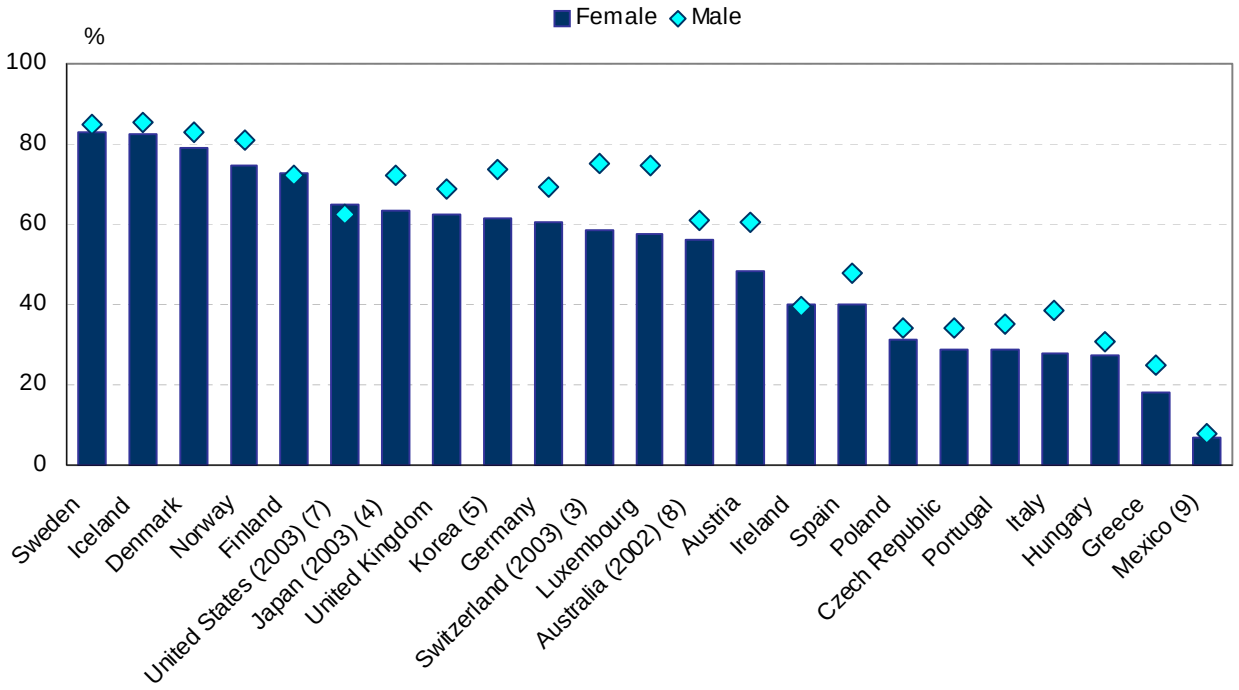
Source: OECD, based on data from Eurostat, Newcronos database, 2006.

Internet access

Internet use by adults is reaching high levels in a growing number of OECD countries. In most of them, though, men are more likely to access the Internet than women. Male access was at least 5 percentage points greater than that of women in more than half of the 23 OECD countries for which data were available (except in Mexico, less than a 1 percentage point) (see Figure 26). Only in Finland, the United States and Ireland, was women's access slightly greater than men's. Men are also more likely to access the Internet than women in the selected non-OECD countries, for which data were available, , except in Chinese Taipei (Figure 27). The gap is greater than 5% in Brazil, Slovenia, Russia and Macedonia.

Figure 26. Individuals(1,2) using the Internet from any location by gender, selected OECD countries, 2004

Percentage of adults by gender

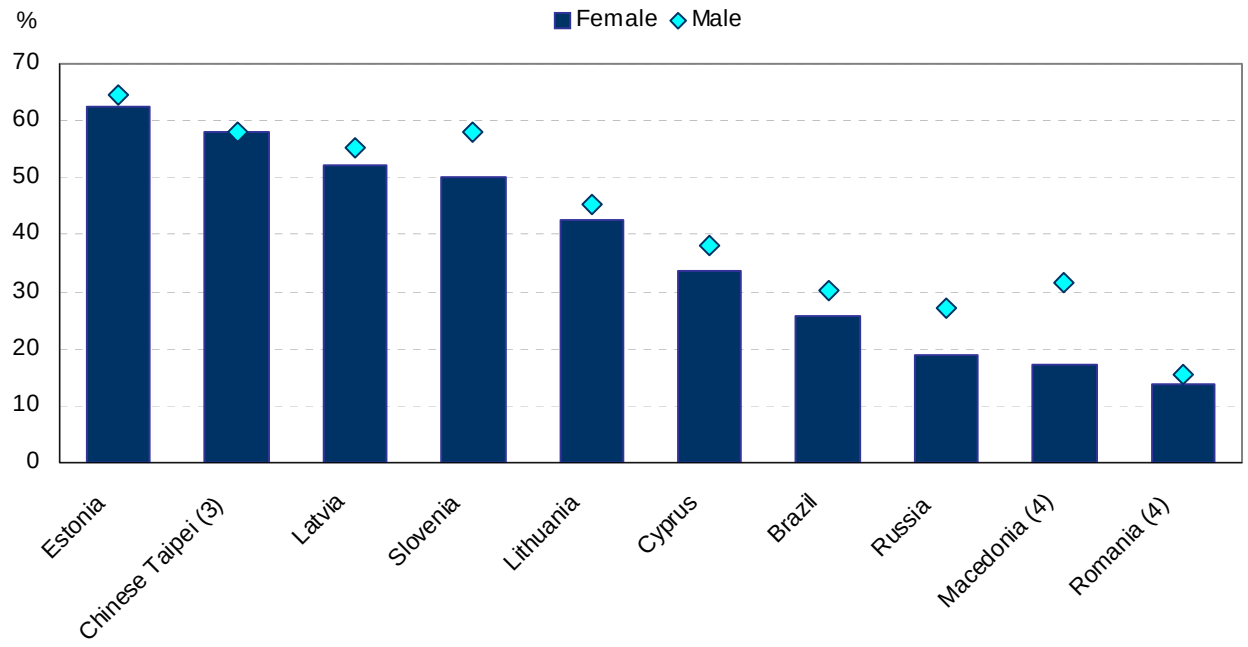


1. Generally, data from the EU Community Survey on household use of ICT, which covers EU countries plus Iceland, Norway and Turkey, relate to the first quarter of the reference year. For the Czech Republic, data relate to the fourth quarter of the reference year.
2. Individuals aged 16-74 years, except for Australia (18+), Canada (15+), the Czech Republic (15+), Japan (6+), Switzerland (14-74). Data generally refer to Internet use in the last 12 months.
3. Private data from Arbeitsgruppe für Werbemedienforschung (WEMF AG). Data refer to Internet users aged 14-74 who used the Internet at least once within the last six months.
4. Aged 6 years or over. The percentages may be relatively high compared to other countries as younger people tend to be greater users of the Internet than older age groups.
5. Individuals who use the Internet at least once a month. For 2000 to 2003, data included Internet accessed only via computer. In the 2004 survey, Internet access through mobile phone was also included.
7. Respondents are asked whether they use the Internet; no time period is specified.
8. Aged 18 years or over. For 2001, data for individuals aged over 64 have been estimated.

Source: OECD (2005a) and Central Statistical Office Ireland (2006).

Figure 27. Individuals[1,2] using the Internet from any location by gender, selected non-OECD countries, 2006

Percentage of adults by gender



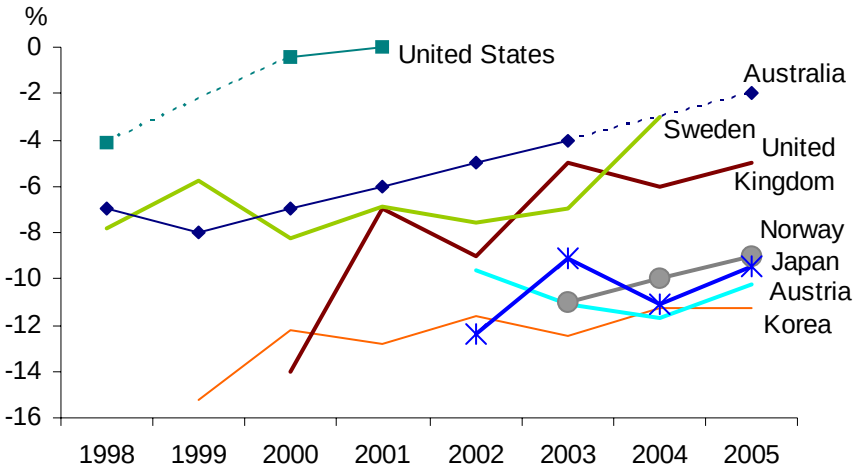
1. Data for Cyprus, Estonia, Latvia, Lithuania, Macedonia, Romania, and Slovenia originate from the 2006 EU Community Survey on household use of ICT, which generally relates to the first quarter of the reference year. Data for Brazil and Russia relate to the summer of 2006.
2. Individuals aged 16-74 years, except for Brazil (10+), Russia (18+), and Chinese Taipei (age not specified). Data generally refer to Internet use in the last 12 months, except for Chinese Taipei (individuals who have ever used the Internet).
3. 2005 instead of 2006.
4. 2004 instead of 2006.

Source: OECD, based on data from Eurostat, Newcronos database 2006, The Public Opinion Database (http://bd.english.fom.ru/report/cat/societas/mass_media/internet/eint0603#Abs1), The Brazilian Network Information Center (http://www.cetic.br/usuarios/tic/2006/rel-int-02.htm), and FIND (http://www.find.org.tw/eng/news.asp?msgid=203&subjectid=4&pos=0).

Evolution of the access gap over time

In most countries the gender gap is being reduced over time, but at different rates. The gap has been significantly reduced in the US, Australia, and the UK, but has remained relatively important in Korea and Austria (Figure 28).

Figure 28. Evolution of Internet access gender gap in selected countries, 1998-2005[1]

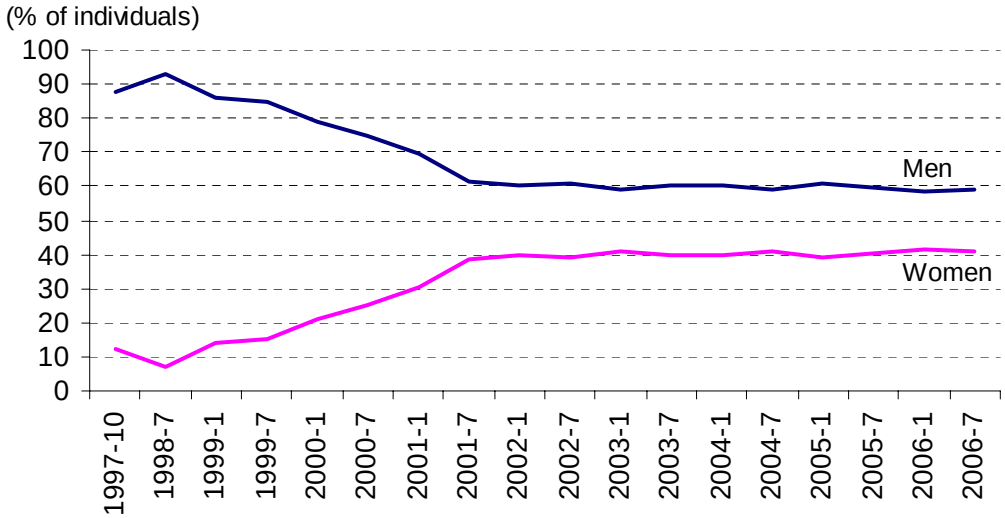


1. Differences in percentage points between women and men Internet use/access; individual home access in Sweden, Internet use from any location in the other countries.

Source: OECD, from national statistical offices, the Korean Network Information Center, and the Ministry of Internal Affairs and Communications of Japan.

By mid-2006, the estimated number of Internet users in China was 123 million. The number of Internet users multiplied by a factor of 200 in 8 years, from an estimated 620 000 Internet users in October 1997. The gender gap declined from about 80 percentage points in 1998 to about 20 percentage points in 2001, but appears to have remained more or less constant since then (Figure 29).

Figure 29. Internet use by gender, China

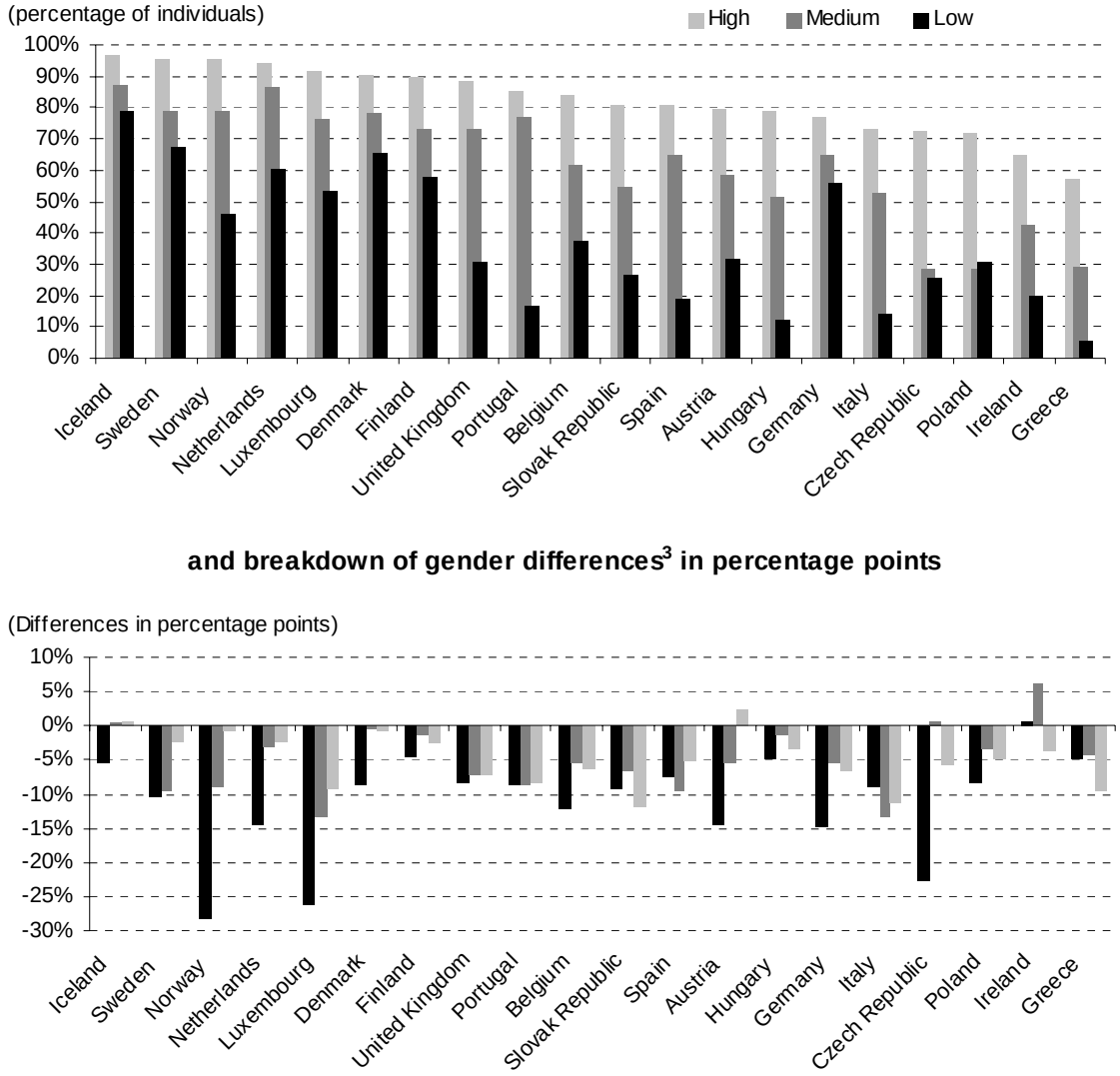


Source: China Internet Network Information Center (CNNIC), China's Internet Development and Usage Report, years 1997-2006.

Internet access by gender and level of education

Internet access increases with the level of education for both women and men. In most of the countries for which data is available the gender divide tends to narrow at higher levels of education, with the exception of Greece, Ireland, Italy, and the Slovak Republic (Figure 29). Widening differences in access at high levels of education are also clearly visible in Turkey (Figure 30).

Figure 30. Internet access[1] by high, medium and low education level[2] in selected OECD countries, 2005

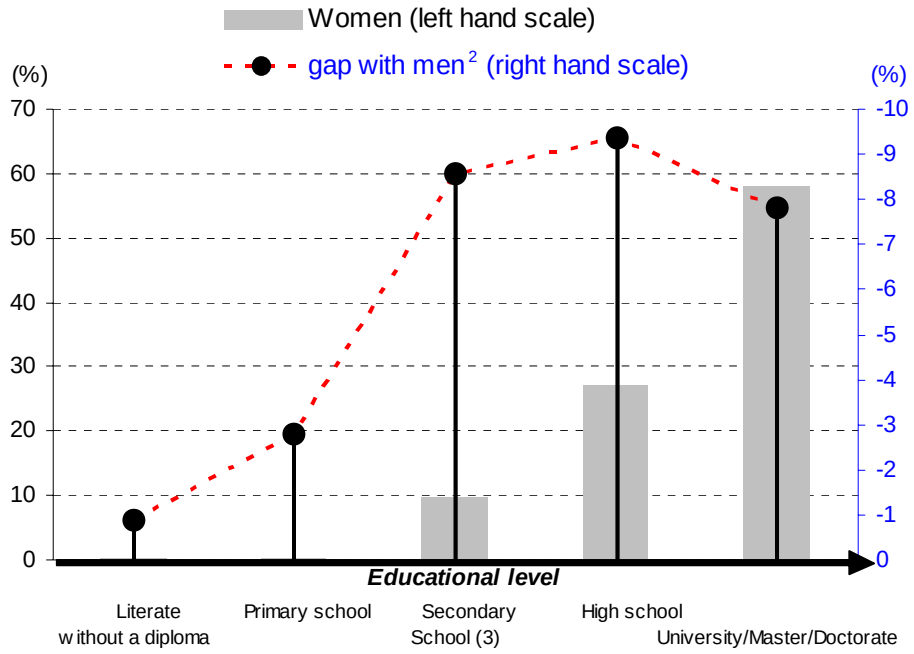


and breakdown of gender differences[3] in percentage points

1. Individuals having accessed the Internet in the 3 last months.
2. Low = ISCED 0 to 2; medium = ISCED 3 to 4; high = ISCED 5 to 6/7.
3. Difference measured as percentages of women minus percentages of men, in percentage points.

Source: OECD, based on data from Eurostat, Newcronos database, 2006.

Figure 31. Internet access[1] by level of education in Turkey, 2005



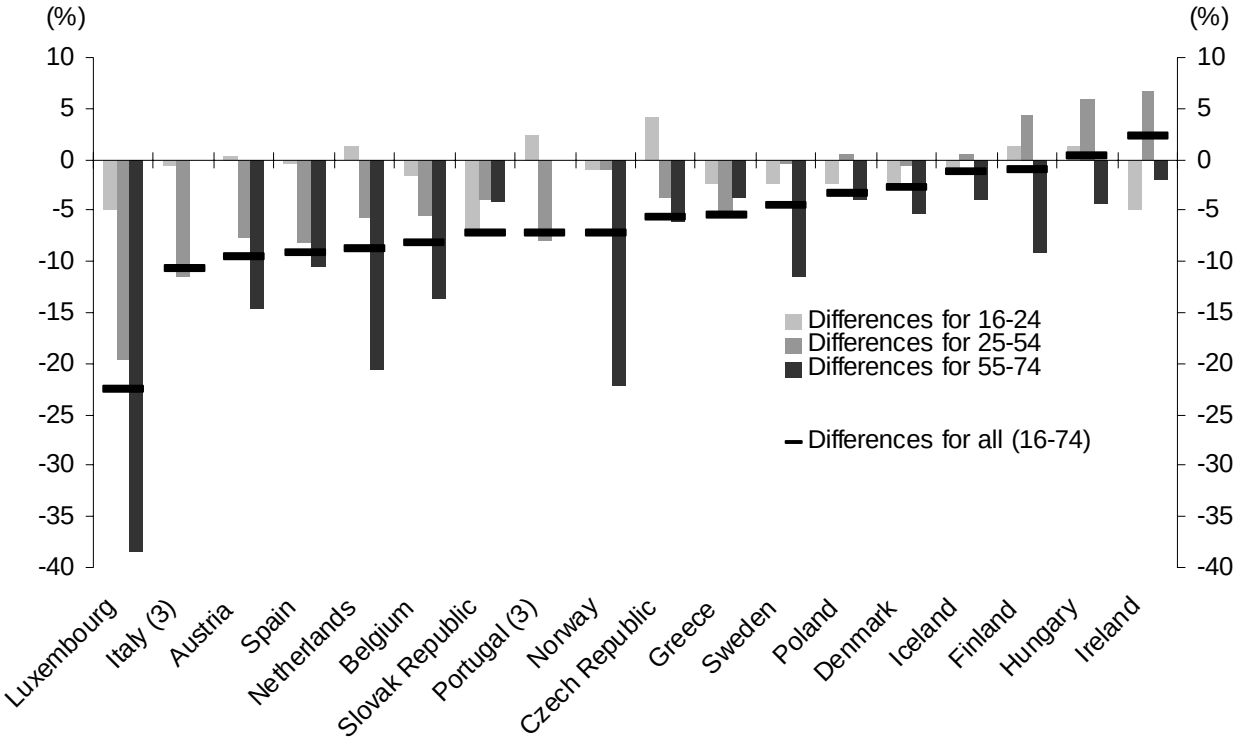
1. Period of reference is 6-12 June 2005.
2. Difference measured as percentages of women minus percentages of men, in percentage points.
3. Including vocational school at secondary school level.

Source: Turkey Statistical Yearbook 2005.

The gender gap also tends to increase with age

Gender differences increase with age in all the countries. Generally, the differences among young are smaller compared to middle age (25-54), which in turn are smaller compared to the elderly, as observed in 10 EU countries (Figure 30), Canada, and Korea. However, in all Nordic countries but Norway and some Eastern countries (Poland, Slovak Republic, Hungary), the gap is less pronounced for the middle aged compared to the young. In the most active phase of the working life (25-54), Ireland, Iceland, Finland and Hungary are also countries where women are in average more likely to use the Internet than men (Figure 32).

Figure 32. Gender differences[1] in Internet users[2] by age categories in 2005, selected OECD countries

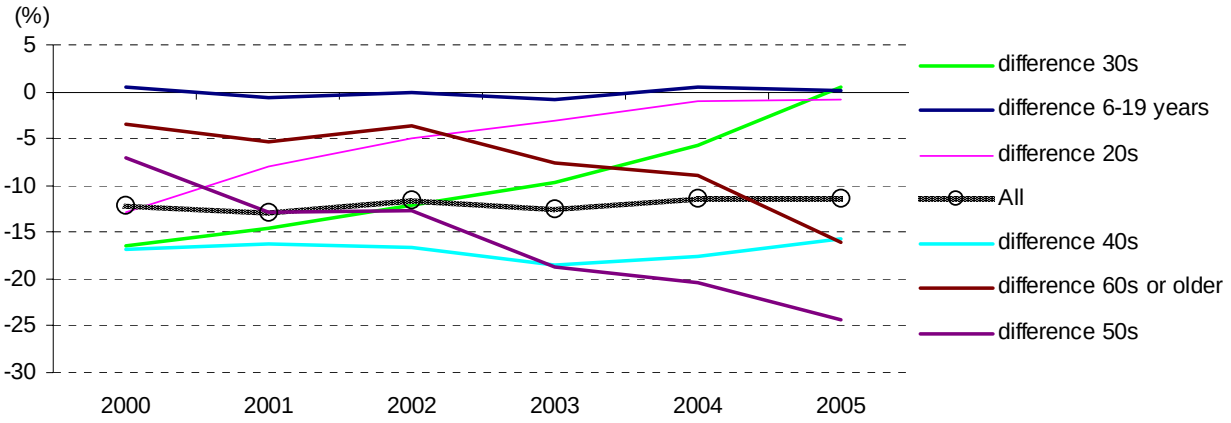


1. Difference measured as percentages of women minus percentages of men, in percentage points.
2. Individuals having used the Internet in the last 12 months.
3. Differences for 55-74 not available.

Source: OECD, based on data from Eurostat, 2006.

In Korea the gender gap has not modified on average over the last few years with around 15% more men than women using the Internet, despite very rapid growth in Internet usage in Korea. Furthermore, the gender gap in Internet usage among the group aged 50 and over increased between 2000 and 2005 and a stable gap remains for the generation in their 40s. On the other hand, for people in their 20s and 30s the sizable gender gap has completely disappeared, and for those below 20 there has never been a gender gap (Figure 33). The increasing gap among the older population may be linked to education and income differences. As a larger share of the population has gained Internet access, those without access are likely to be less-educated and poorer with a larger share of women in these groups.

Figure 33. Gender differences[1] in Internet use in Korea, 2000-2005



1. Differences expressed as women's Internet usage minus men's, in percentage points.

Source: OECD, based on data from the National Internet Development Agency of Korea, 2006. Available at: http://isis.nic.or.kr/english/sub02/sub02_index.html?flag=2

Place of Internet access

The Internet has become a tool in everyday life in many OECD countries, at work as well as at home, and access in the workplace is an important determinant of home Internet usage (OECD, 2004a). The home remains the most common place to use the Internet except in the Slovak Republic, but work is not very far behind the home in terms of access in the Czech Republic, Greece, Portugal or Spain. In all countries except Brazil, Korea and the Netherlands, men are more likely to access the Internet from home than women. Gender differences in workplace access are mixed. They are to the detriment of women in Austria, Korea, Luxembourg, Netherlands and Norway, and to their benefit in Finland, Poland and Slovak Republic.

In countries where home access for various reasons (mainly infrastructure and cost of access) is still in its infancy, work or public places (cybercafés, etc) substitute for home access. Social norms governing interactions in public places also influence Internet usage pattern (Orbicom, 2005). In Korea commercial public access facilities are places where people like to connect to the Internet despite very high home usage rates, but women are less likely to access the Internet from commercial public access facilities.

Using the Internet from educational establishments is less common compared with work or home, but in all the selected countries women are generally more likely to access the Internet from these establishments than men although there are exceptions (Brazil, Canada, Germany, Hungary, the Netherlands, Poland, see Table 3). Data for the US show similar patterns, with women more likely to access the Internet from school than men, although both home and work are much more common places for accessing Internet, and men are more likely than women to access from both.

In Canada, the breakdown of gender differences by age category and place for 2005 shows significant variations by age. Women in the 35-54 age group are more likely to use the Internet from home compared to men, but the reverse situation occurs for women aged 65+. From work, women in the 55-64 age group are less likely to use Internet compared to men. Young women (18-34) are also more likely to use Internet from public libraries than men of their age (Figure 34).

Table 3. Places where Internet has been used[1] by women and men[2], selected countries, 2005

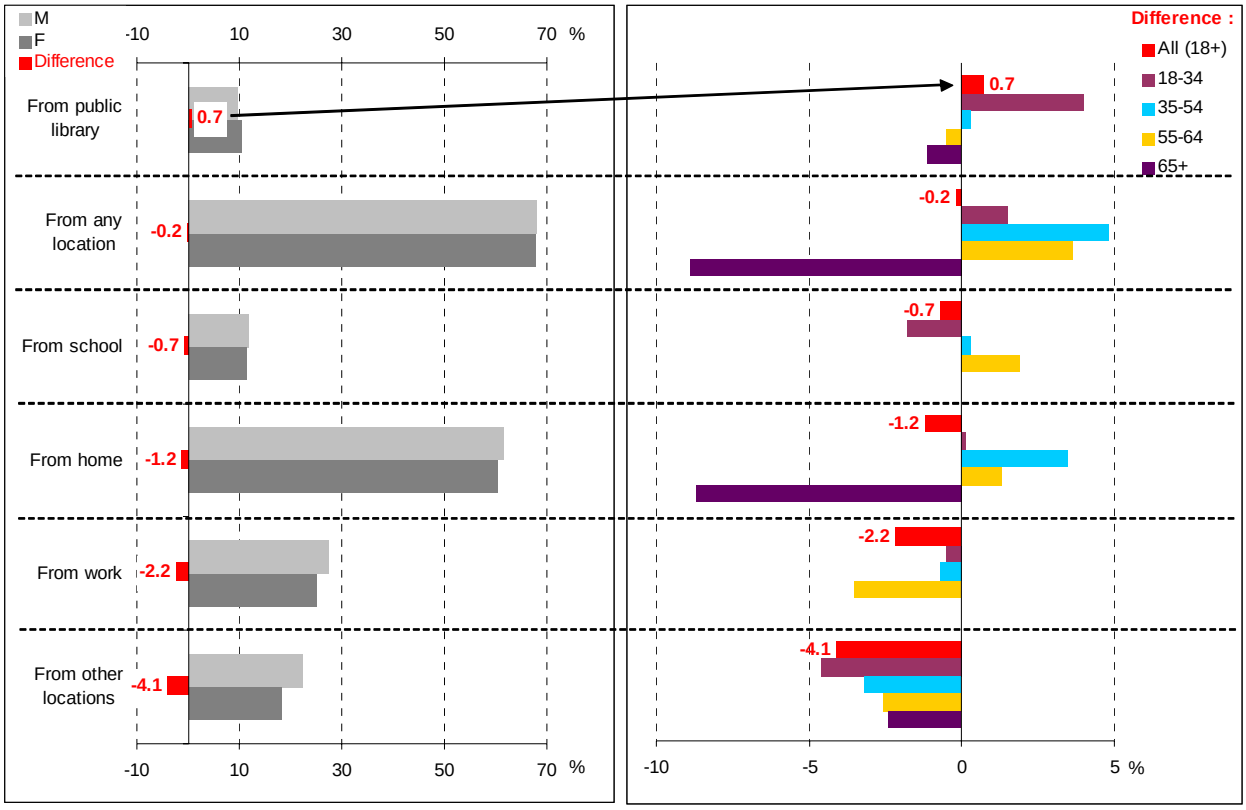
	at home		at work		at place of education[3]		other people's house	
	Women	Men	Women	Men	Women	Men	Women	Men
Australia	50.0	53.0	28.0	31.0	9.0	8.0	20.0	18.0
Austria	73.6	75.2	41.4	47.7	9.4	8.3	1.9	3.8
Belgium	79.4	83.0	29.7	31.4	9.2	7.5	4.8	5.7
Canada	60.3	61.5	25.2	27.4	11.3	12.0	..	..
Czech Republic	59.9	62.9	43.2	43.8	23.2	19.7	6.5	7.0
Denmark	92.7	93.3	47.7	48.7	14.9	13.7	..	..
Finland	74.1	80.8	53.3	50.8	..	..	5.5	9.1
Germany	86.1	89.0	27.7	34.0	12.9	14.6	6.3	10.0
Greece	60.9	65.9	40.4	46.5	18.9	14.8	10.0	13.1
Hungary	52.8	59.0	43.9	46.5	18.9	19.8	15.5	15.3
Iceland	87.5	91.5	52.3	56.1	19.7	20.0	11.5	15.5
Ireland	66.8	71.1	44.4	47.2	10.9	9.7	6.3	9.2
Italy	68.9	74.1	44.8	49.1	13.5	9.9	9.3	12.1
Luxembourg	92.3	94.5	28.3	45.4	14.9	13.1	3.1	4.9
Netherlands	93.4	93.1	40.1	50.9	10.3	11.0	3.6	3.9
Norway	83.0	85.7	54.0	62.3	17.9	13.3	7.0	11.0
Poland	56.5	59.5	34.2	29.3	28.1	28.7	15.4	18.9
Portugal	58.4	63.2	47.0	49.3	28.6	20.7	13.8	15.5
Slovak Republic	34.0	45.4	56.2	51.8	23.7	20.3	22.1	24.5
Spain	60.7	65.9	44.2	47.2	19.9	17.5	23.3	24.1
Sweden	84.8	88.7	47.7	49.7	16.8	12.5	5.1	7.2
United Kingdom	83.0	83.2	44.9	48.3	17.5	14.1	21.0	26.9
Brazil	46.5	37.6	31.2	21.7	17.1	25.5	18.7	16.6

1. Used in the last three months for EU countries, past 12 months for Australia and Canada.
2. People aged 16 to 74 for EU countries, 10 and over for Brazil, and 18 and over for Australia and Canada.
3. Technical and further education or Tertiary Institution for Australia, school for Canada and Brazil.

Source: Eurostat, Newcronos database 2006, Statistics Canada, Australian Bureau of Statistics, and Brazilian Network Information Center.

Figure 34. Gender differences in Internet use in Canada by location[1], and breakdown of difference[2] by age, 2005

percentage of individuals aged 18 years and more



1. Percentage of all individuals aged 18 years old and over who responded to have used the Internet for personal non business purposes in the past 12 months from any location.

2. Difference measured as percentages of women minus percentages of men, in percentage points.

Source: OECD, based on data from Statistics Canada. *Canadian Internet use survey*, reference year 2005, Table 358-01241.

Differences in Internet use

This section examines the gender patterns in Internet use. What people choose to do with Internet mirrors who they are, their tastes, their activities, and the social group that they belong to.

Figures 32 to 35 provide examples of similarities and differences in the pattern of Internet activities between men and women. Emailing is a very common activity for all Internet users (more than 6 Internet users out of ten), and the gender difference does not exceed 5 percentage points (Figure 35). Downloading software is much less widespread and is a much more a male oriented activity. By contrast, women are considerably more likely to seek health-related information on injury, disease or nutrition on Internet.

These patterns also exist in France (Figure 36), and partly in Canada (from home, for health information search, Figure 37) and in Korea (for downloading of software, Figure 38). The French data show that women are much more likely to search for health information and much less likely to use the Internet for entertainment (music, films, games) or to download software than men. The Canadian data show that women are more likely to search for all kinds of health-related information. Additionally the

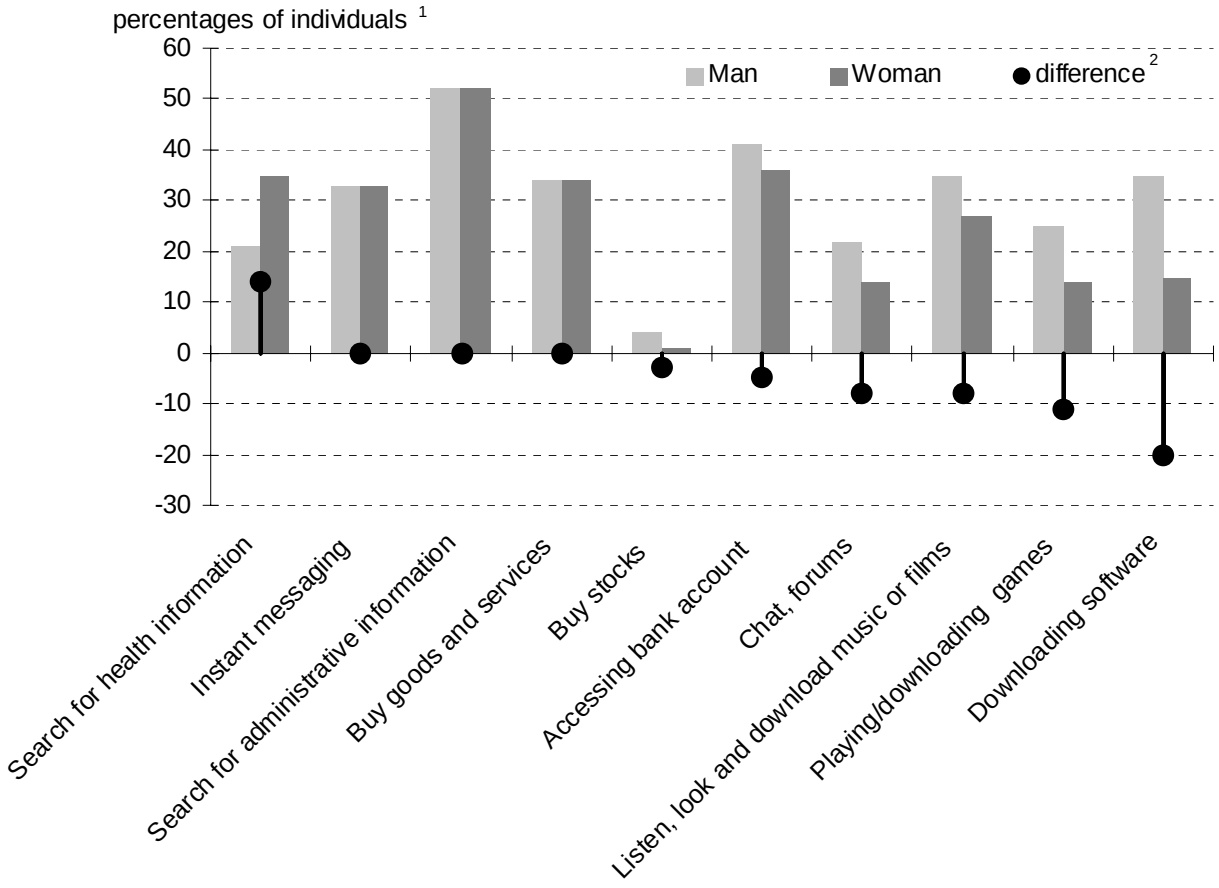
Korean information shows that women are much more likely to use the Internet for shopping and to make reservations.

Figure 35. Gender differences for selected Internet activities in selected OECD countries, 2005

1. Percentage of individuals aged 16 to 74 or more having used Internet in the last 3 months.
2. Difference measured as percentages of women minus percentages of men, in percentage points.

Source: OECD, based on data from Eurostat, Newcronos database, 2006.

Figure 36. Gender differences in Internet use in France, 2005

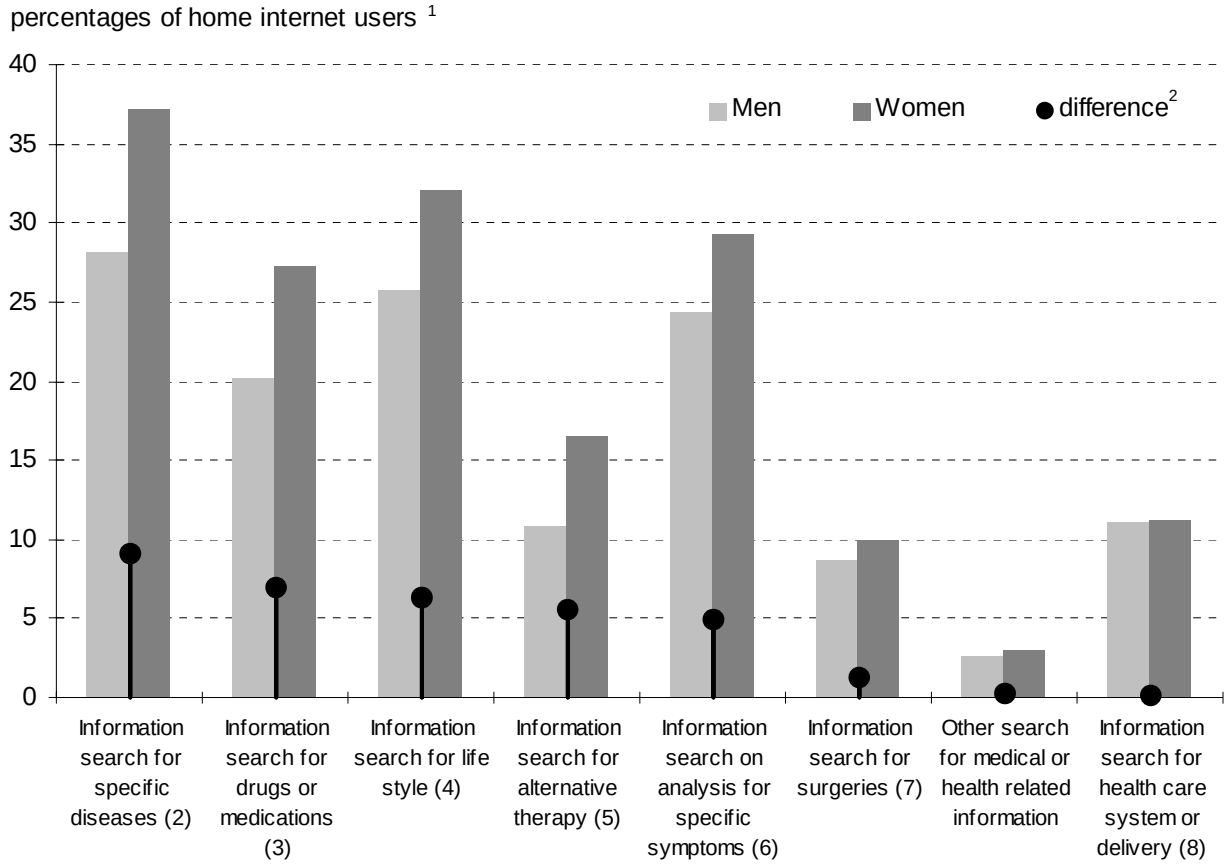


1. Percentage of individuals aged 15 or more having used Internet at least once.
2. Difference measured as percentages of women minus percentages of men, in percentage points.

Source: *Technologies de l'information et de la communication*, October 2005 Survey, INSEE.

Figure 37. Gender differences in Internet use in Canada, 2005

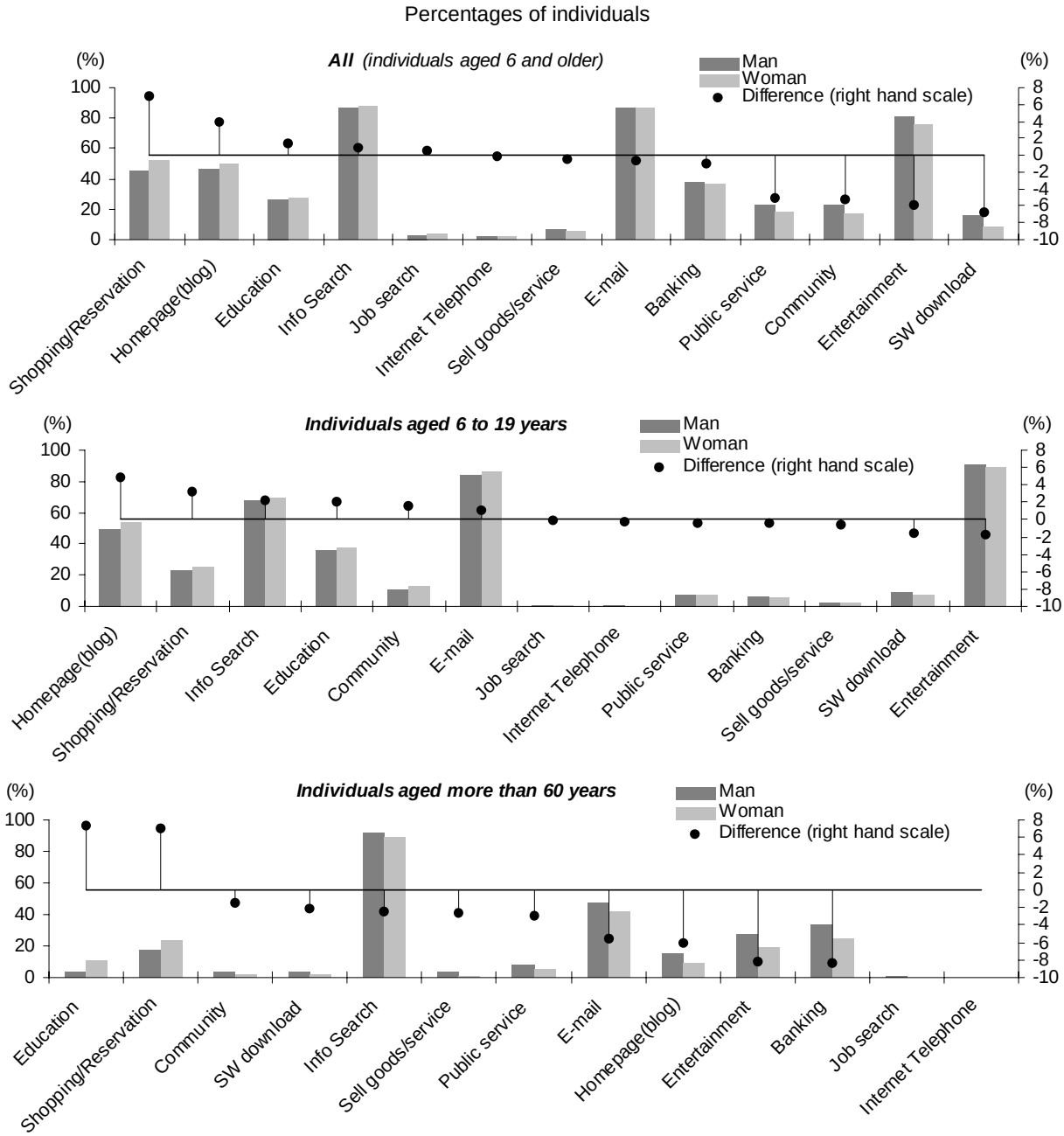
medical or health related information search



1. Internet users at home are individuals who answered they used Internet from home in the past twelve months.
2. Difference measured as percentages of women minus percentages of men, in percentage points.
3. Specific diseases (example; diagnosis, new research, treatment or other specific diseases).
4. Life style (example; diet, nutrition, exercise, health promotion or illness prevention).
5. Alternative therapy (example; herbal medications, aromatherapy or acupuncture).
6. Analysis for specific symptoms (example; rash, fatigue or mole).
7. Surgeries (example; hernia, appendectomy or other surgeries).
8. Health care system or delivery (example; structure or physicians).

Source: Statistics Canada, *Canadian Internet Use Survey*, year 2005, Table 358-01311,2.

Figure 38. Internet usage pattern by gender and age in Korea, 2005



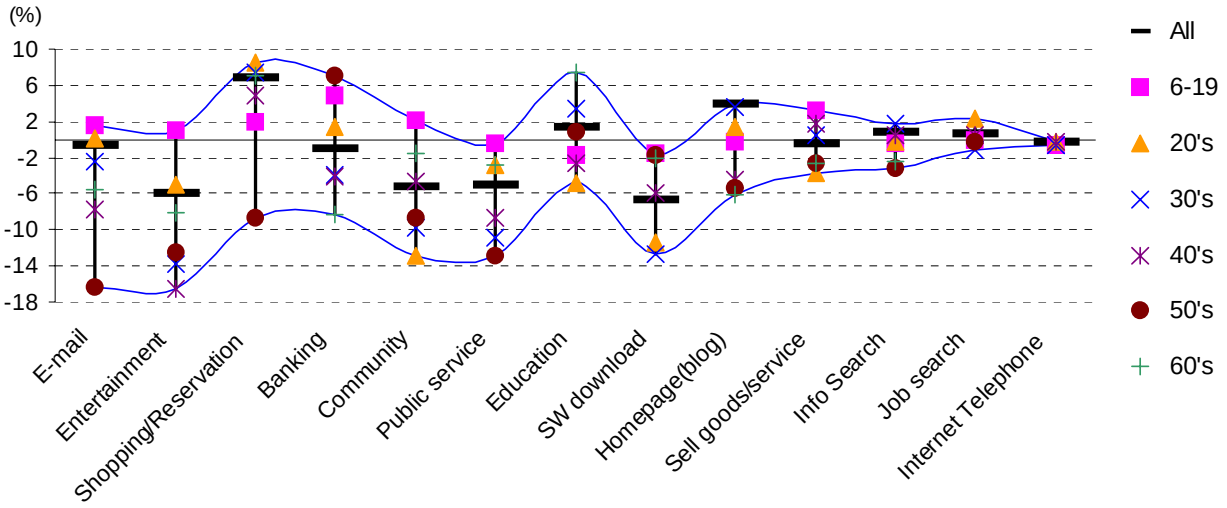
1. Difference measured as percentages of women minus percentages of men, in percentage points.

Source: OECD, based on data from the National Internet Development Agency of Korea, 2006. Available at: http://isis.nic.or.kr/english/sub02/sub02_index.html?flag=2

Internet usage patterns by gender are strongly influenced by the users' age. For example, detailed Korean data show that there are considerable differences between activities of women and men when broken down by age categories. For example younger Korean women are more likely than men to use e-mail whereas in the group over 60 years old, men are considerably more likely to use e-mail, perhaps reflecting the more general gender differences by age group discussed earlier for Korea. Gender

differences are much smaller overall in the younger age categories, although blogging is somewhat more female-oriented for the younger age groups. Differences are more marked amongst older age groups, but in what appears to be an internationally common pattern. Women focus on education, shopping, etc., whereas men focus on entertainment and banking (Figures 38 and 39).

Figure 39. Gender differences[1] in Internet usage pattern by age categories in Korea, 2005



1. Difference calculated as women minus men, in percentage points.

Source: OECD, based on data from the National Internet Development Agency of Korea, 2006. Available at: http://isis.nic.or.kr/english/sub02/sub02_index.html?flag=2

Conclusion

This paper gives an overview of the differences between men and women in ICT-related employment, ICT education and training and ICT access and use. It finds that there are significant differences between women and men in ICT-related employment, with women having low shares of employment in ICT specialist occupations (*e.g.* software engineers, IT specialists) and among intensive users of ICTs they are most heavily represented in office and secretarial occupations rather than professional ones. These gaps tend to persist over time and in some cases increase, unlike the differences between women and men in other areas of employment except management posts where there are enduring differences between men and women. These differences are also a reflection of educational patterns, with women tending not to go into ICT education to the same extent as men.

In terms of ICT access across the whole population, differences are significantly lower, but women tend to have lower access to ICTs (PCs and the Internet) overall and these gaps are accentuated amongst older age groups. In terms of actual use of ICTs, it is found that women and men tend to use their access differently, and in their use of the Internet there are significant differences between how women tend to use the Internet compared with men.

Although this is not studied in this analysis, the significant differences between women's and men's participation in ICT employment and education in their access to ICTs suggest that for both equity and efficiency reasons there may be considerable room for policy to close the ICT gender gap. Initiatives may range from ensuring that legal frameworks are supportive of equal treatment of women and men in terms of ICT-related employment and education and training, to direct support measures such as specific funding schemes for ICT employment and programs aiming at achieving a better gender balance in ICT-related

education and training.[6] Improving the image of the ICT sector, and of ICT-specialist type jobs is also important to attract students and attract and retain women in ICT-related employment.

If more resources are available in 2007-2008, further work could be undertaken for example on: ICTs and flexitime/time at work; the impact of ICT, and of broadband in particular, on female labour market participation and telework; incomes of women and men in ICT-related occupations and their evolution over time; and differences in the time budget for the use of ICTs by gender. This analytical work could be complemented by a review of policy measures – and identifying possible best practices – currently implemented in order to change the participation of women in ICT-related education and training, in ICT occupations, and to remove barriers (socio-cultural/infrastructural/ access) that restrict women from accessing and using ICTs.

6. For further discussion, see for example OECD (2002, 2003, 2004b and 2005b), "Babies and bosses, reconciling work and family life", Volume 1 to 4, OECD, Paris.

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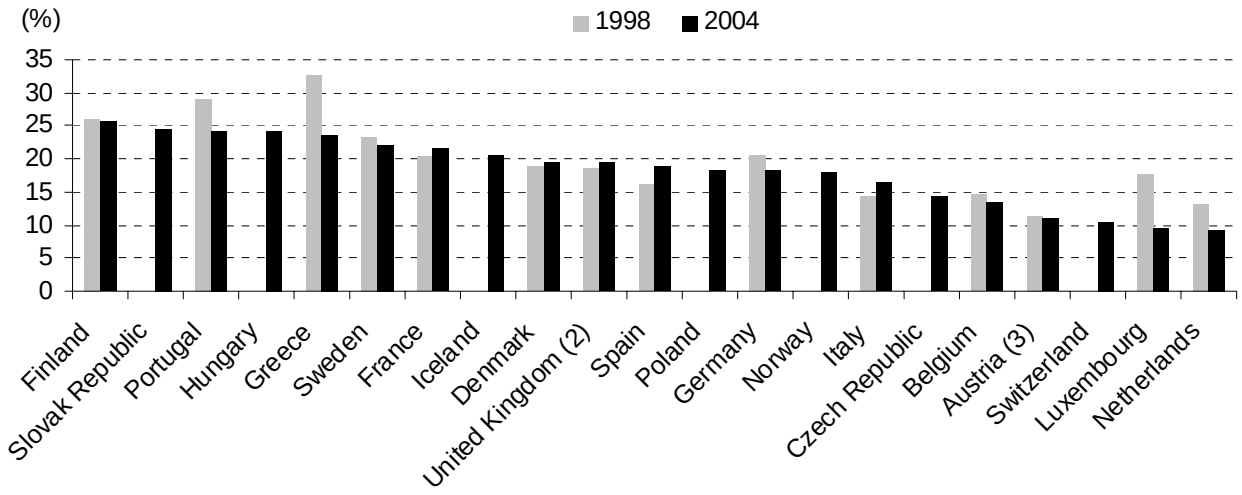
APPENDIX

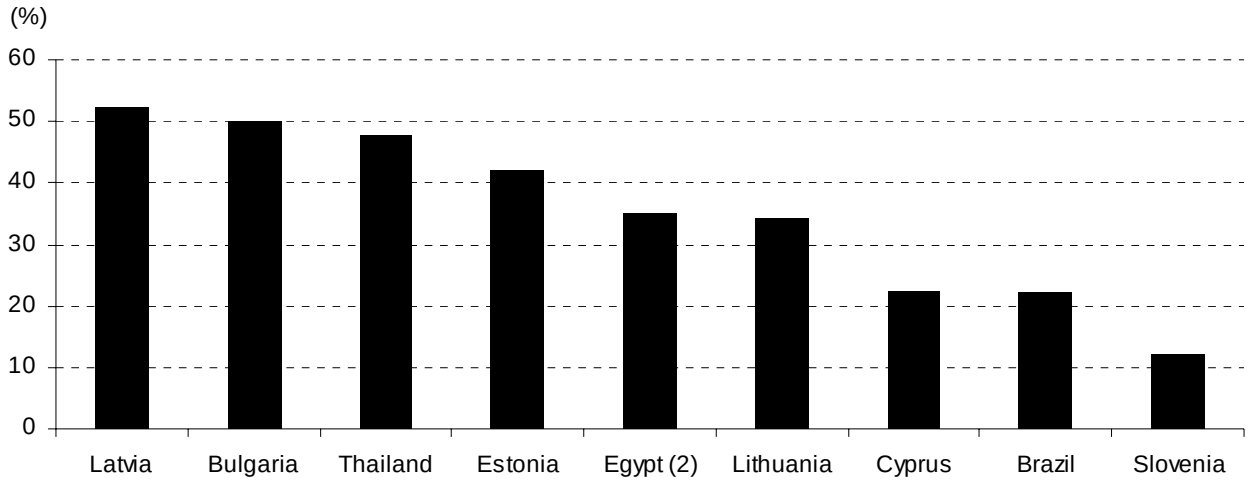
Appendix Figure 1. Share of women computing professionals and computer associate professionals[1], selected OECD countries, 1998 and 2004



1. Computing professionals = ISCO 213, and computer associate professionals = ISCO 312.
2. 2001 instead of 1998.
3. 2003 instead of 2004.

Source: OECD, based on data from Eurostat, Newcronos database, 2006.

Appendix Figure 2. Share of women computing professionals and associate professionals[1], selected non-OECD countries, 2000



1. Computing professionals = ISCO 213, and computer associate professionals = ISCO 312.
2. 1996 instead of 2000.

Source: OECD, based on data from ILO database, 2006.