	WWW-ICT ***IST–2001-34520*** ***Widening Women's Work in Information and Communication Technology***

Deliverable N°1

Conceptual framework and state of the art

	Project funded by the European Community under the "Information Society Technologies" Programme (1998-2002)

– *Behavioural skills*

Table 3 : graduate levels of computer professionals, according to the categories of table 1

3.2 Internet and multimedia professions

Table 4 : categories of emerging Internet and multimedia professions

Production	***Design***
– – –	– – – – – – –
Realisation	***Implementation and exploitation***
– – – – – –	– – – –
Distribution	***Use***
– –	– – –

Sources: De Baenst, Lobet, Noirhomme, 1999; Career Space, 2001a

3.3 Applicative professions

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3.4 Advanced users

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ICT and e-business skills in Europe

Information society jobs – quality for change

The labour market of IT professionals in Europe *Social Europe*

The supply of IT workers in the US

E-business and ICT skills in Europe
e

Europe's growing IT skills crisis

Systèmes ERP, emplois et transformations du travail

Technologies de l'information, emploi et qualité du travail

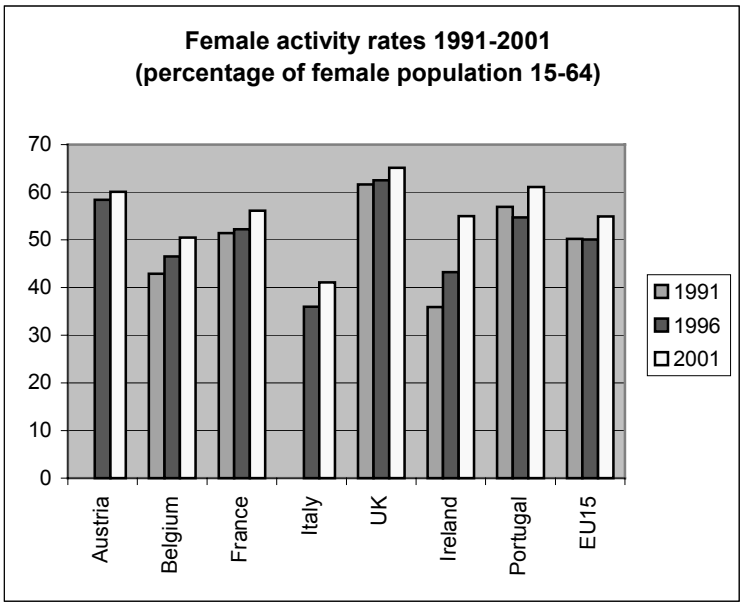
Chapter II
Mapping gender gaps in employment and occupations

Juliet Webster, RCWE (UK), and Gérard Valenduc, FTU (B)

1. Background data on women and the labour market

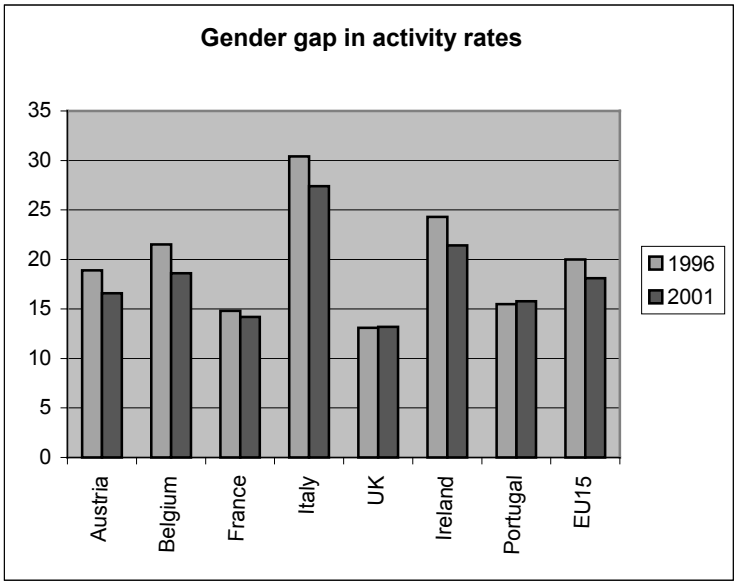
1.1 Women in European labour markets

Figure 1: female activity rates 1991-2001



Employment in Europe 2002,

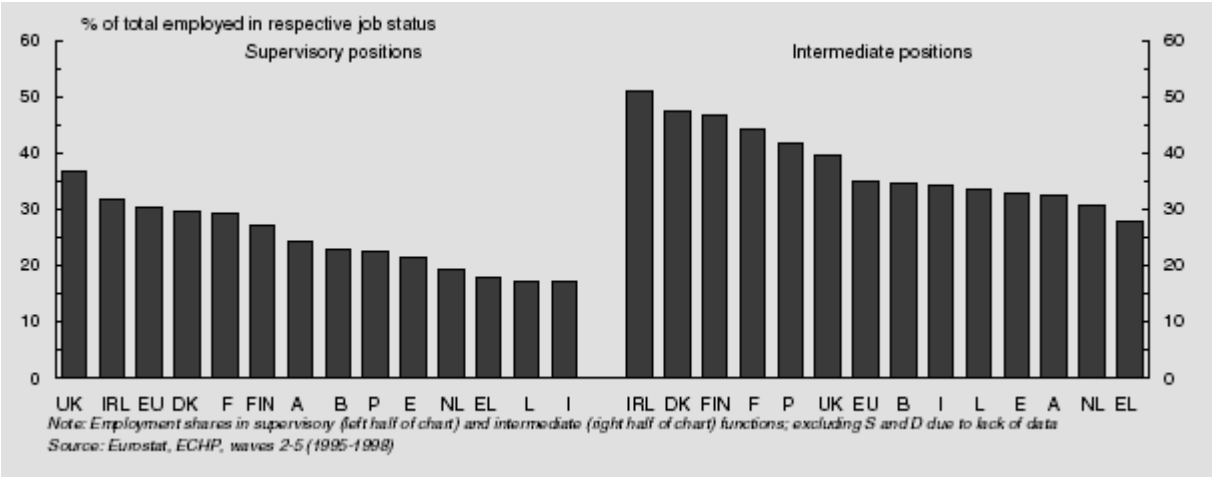
Figure 2: gender gap in activity rates in selected EU countries (difference between men's and women's activity rate)



Employment in Europe 2002.

1.2 Women and wage gap

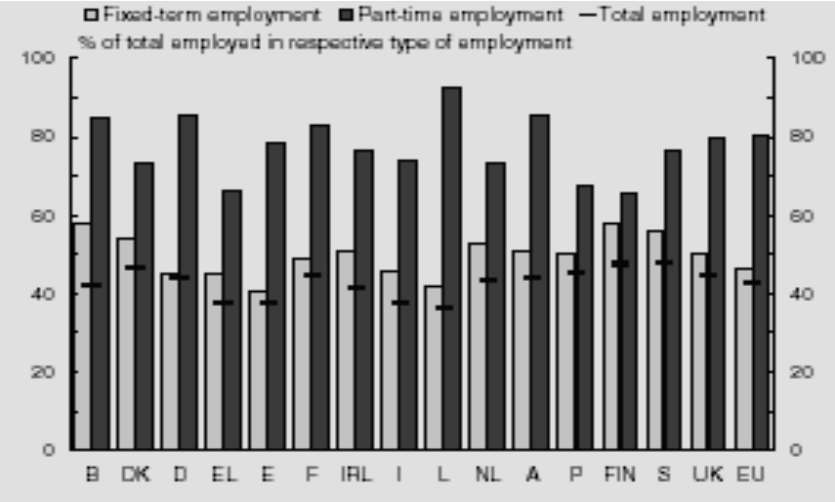
Figure 3 : Female employment share among employed in supervisory and intermediate positions in the EU



Source: EC, Employment in Europe 2002, p. 37

1.3 Women and non-standard work status

Figure 4 : Female employment shares in non-standard employment in the EU, 2001

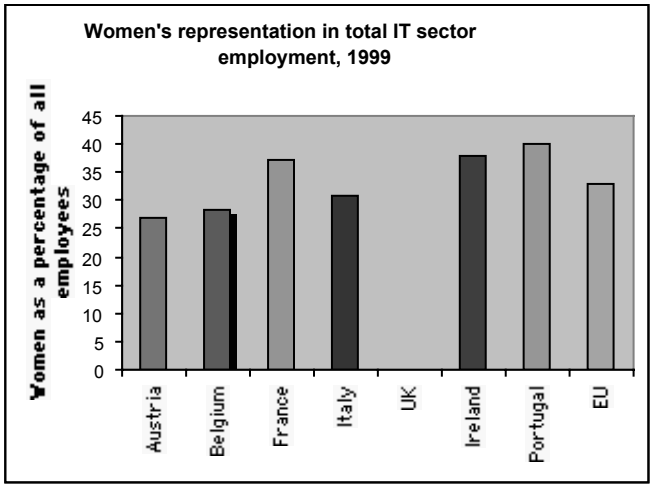


Source: EC, Employment in Europe 2002, p. 37

2. Women in ICT jobs

2.1 Women's representation in ICT sectors

Figure 5: women's employment in ICT sectors, 1999



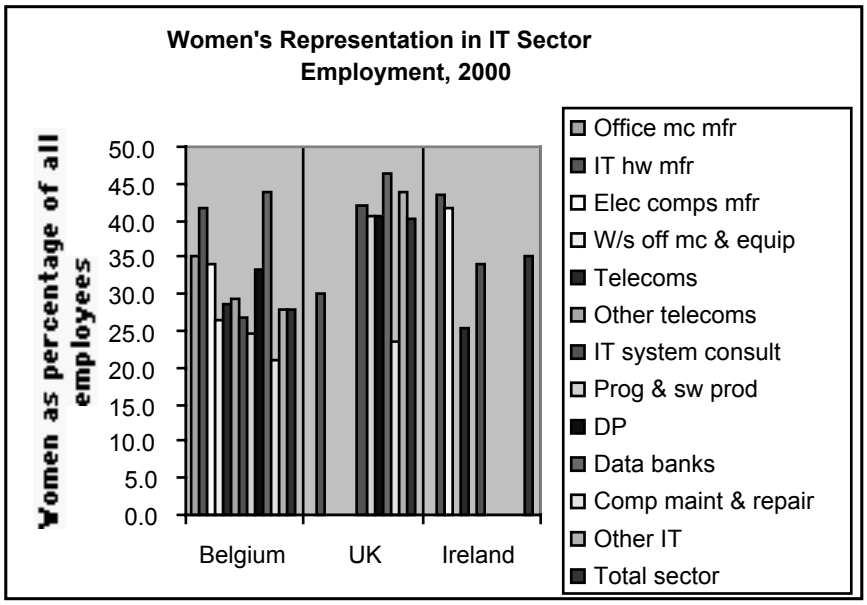
Source: Millar (2001), our tabulation from her data.
UK data not available.

Table 1:
Evolution 1997-2001 of M/F employment in ICT sectors in the WWW-ICT countries
(thousands of employees)

Source: Eurostat, data from the Labour Force Survey.
LFS data on Portugal are below the threshold of reliability.
All data on self-employment are below the threshold of reliability.

Employment in Europe 2001

Figure 6: women's employment in IT sectors in Belgium, the UK and Ireland, 2000



Sources: Belgium, National Institute for Statistics, figures for June; UK, Office for National Statistics, Annual Business Inquiry, 2000; Ireland, Millar and Jagger, 2001.

Table 2: changes in men's and women's employment in ICT sectors, UK, 1997-2000

	1997		1998		1999		2000		% change 1997-2000	
SIC code and sector	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**

Source: Office for National Statistics, Annual Business Inquiry, successive years.

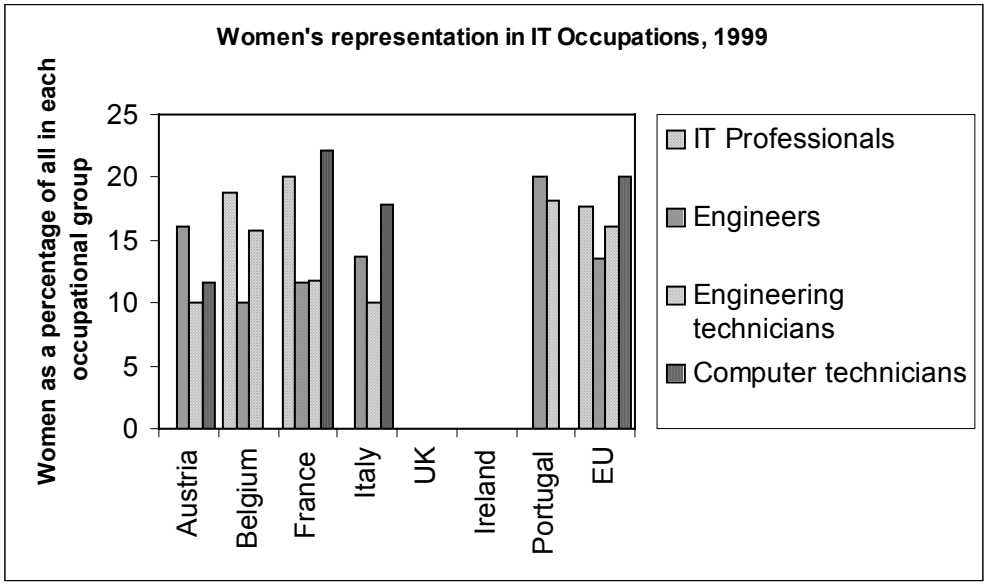
Table 3: changes in women's employment as intellectual workers in computer-related services, Belgium, 1995 to 2000

							% Increase	
							Total	F
			25.4%			26.8%	27.1%	34.5%
			20.3%			28.1%	-16.1%	16.1%
			23.5%			30.0%	314.2%	429.7%
			30.1%			26.5%	52.7%	34.3%
			25.2%			24.5%	175.1%	166.9%
			37.1%			32.9%	58.5%	40.3%
			44.6%			43.5%	288.9%	279.7%
			15.6%			17.1%	377.1%	423.7%
			35.7%			28.3%	137.1%	88.0%
Sub-total computer services (NACE 72)	17442	5051	29.0%	36503	9511	26.1%	109.3%	88.3%

Source: National Institute of Statistics, Brussels (INS).

2.2 Women's representation in ICT occupations

Figure 7: women's representation in ICT occupations in selected EU countries, 1999



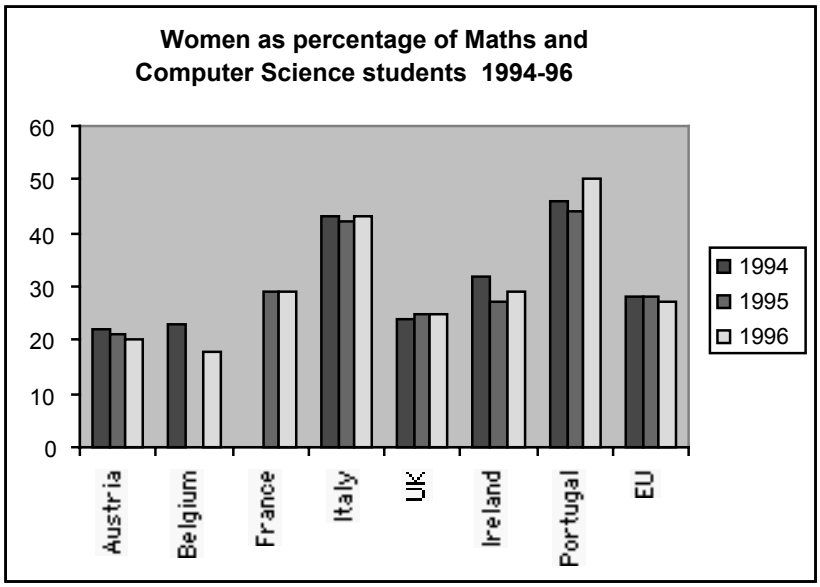
Source: Millar (2001), our tabulation using her data.

Table 4:
Evolution 1997-2001 of M/F employment in ICT occupations in the WWW-ICT countries (thousands of employees)

Source: Eurostat, data from the Labour Force Survey, calculations FTU.
Data in brackets are considered as poorly reliable by Eurostat.
LFS data on Portugal are below the threshold of reliability.
All data on self-employment are below the threshold of reliability.

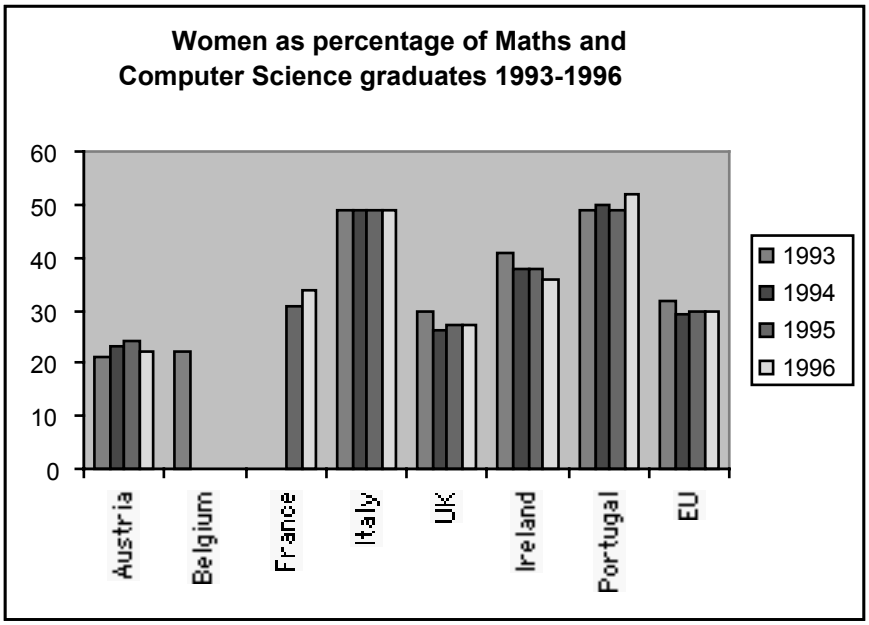
3. Women in ICT Education

Figure 8: women as a percentage of Maths and Computer Science students, 1994-96



Source: Millar, J. 2001, our table constructed from Millar's data.

Figure 9: women as a percentage of maths and computer science graduates, 1993-96



Source: Millar, J. 2001, our table constructed from Millar's data.

Table 5: women as a percentage of computer science undergraduate students, 1997-2001

Sources and Notes:

Austria: Statistik Austria. Figures are for total enrolments on Informatics and Telematics courses in Technical Studies. Figures not disaggregated by degree level.

Belgium: Council of French Speaking Rectors and Ministry of Flemish Community. Data are collected separately by and for the French and Flemish speaking communities, and there are slight differences in degrees in the two parts of the country.

UK: Higher Education Statistics Agency.

both

and

4. Women as ICT users

Table 6
Percentage of women among Internet users

Sources: Nielsen (May 2001), Netvalue (January 2002), quoted by Stewart J. (SIGIS), 2002.

Les Européens et la e-inclusion
Les Européens et les TIC dans le cadre de leur travail

Table 7: PC and Internet use by gender in selected EU countries, 2000 (%)

	PC			Internet		
	Men	**Women**	**All**	**Men**	**Women**	**All**
Austria						
Belgium						
UK						

Source: Eurobarometer

5. Concluding comments

5.1 Interpretation of quantitative data: no obvious correlations

Table 8: women's activity rate and women's share in ICT occupations

	Austria, Belgium, UK	*None of the WWW-ICT countries*
	France, Portugal	*Italy, Ireland*

Table 9: women's share in ICT degrees and women's share in ICT occupations

Austria, Belgium, UK	*Portugal, Ireland, France*	*Italy*

5.2 Methodological issues

– *Difficulty of comparing educational data.*

– *Employment and occupational data coding systems remain differentiated.*

– *Difficulty of combining sectoral and labour force data – levels of disaggregation.*

– *Coding systems need to be constantly revised to take account of new developments in ICT work.*

5.3 Substantive issues

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Internet et inégalités

Chapter III
Gender issues in European socio-economic research on the Information Society

Juliet Webster, RCWE (UK)

1. Two ways of approaching gender

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mainstreamed

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central problematic

Table 1: EU socio-economic research projects on the Information Society and ICTs treatment of gender

2. The Information Society labour market – quantitative indicators and gender dimensions

3. The Information Society and the quality of working life – gender dimensions

though not determined by

3.1 Flexible working time

Gender dimension:

3.2 Flexible contracts

Gender dimension:

3.3 Locational flexibility

New Media: Working Practices in the Electronic Arts

Work Opportunities for Women in the Information Society: Call Centre Teleworking

Gender dimension:

3.4 Functional flexibility

Gender dimensions:

4.5 Skills, knowledge, training and learning

Industrial Rationalization as Gender Politics: New Perspectives for Women through Organizational Development and Job Design at the Workplace

Women, Work and Computing

Gender dimensions:

4. The work/life/family interface

Gender dimensions:

5. Concluding comments

Chapter IV
Describing the various dimensions of the gender gap in ICT professions

Patricia Vendramin, FTU (B)

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1. Imbalances in education and training

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2. Working conditions that disadvantage women

2.1 The characteristics of work

2.2 The organisation of work

2.3 A specific labour market

3. Professional careers that favours the men

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4. Cultural factors that reinforce the male image of ICT

5. A gender bias in systems design

Table 1: quality standards attributed to the software interfaces by men and women

24

6. Concluding comments

Informationsgesellschaft

Der Beruf der Computerfachkraft Frauen in der

a) Training

b) Organisation

c) Labour market

d) Culture

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Integrated gender perspective on human-centred approaches to developing computerised office systems Networking: connecting people in and between organisations

Wie Softwareentwicklerinnen und Entwickler ihre Arbeit beschreiben Frauen in der Informationsgesellschaft

Part II

Interpretation and discussion of factors explaining the gender gap in ICT professions

Chapter V
Cultural and psychological factors

Ina Wagner, Andrea Birbaumer, Marianne Tolar, TUW, (A)

1. Theoretical approaches

Paris Is Burning

us

2. Analyses of computing culture

2.1 The computer as "masculine"

working on *working with*

Who is designing what for whom

2.2 The concept of ambivalence

3. Gender differences from the perspective of psychology

3.1 Attribution

3.2 Self-efficacy

3.3 Examining positive orientations

3.4 Ethnicity and culture

3.5 Attachment begins at an early age

watching

show

4. Gendered practices of computer design and use

4.1 Programming styles – gendered approaches

4.2 Computer games

4.3 Gendered designs

4.4 Internet use

5. Women computer scientists

5.1 Hostile work environments

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5.2 Women's contributions to the computing culture

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Chapter VI : Education and training

Caroline Guffens, FTU (B)

1. Unequal access to computer and gender bias in software design

1.1 The first access

Table 1: computer equipment in relation with family situation

1.2 Computing at school

Table 2: number of pupils per computer with and without an Internet connection in primary and secondary education (ISCED 1-3) (%)

	EU															
Primary																
Secondary																

2. Attitudes of girls and women: behind generally accepted ideas

2.1 Understanding the differences

2.1.1 Girls do not like science

**Table 3: proportion of female students by field of study,
in tertiary education ISCED 5,6, (compared to male students) D1-2 (%)**

	EU															
	27															
	30															

2.1.2 Lack of confidence

How negative expectancies and attitudes undermine female's math confidence and performance, a review of the literature,

2.1.3 Social concern … also in computing

2.2 Pressure of the social context

2.2.1 Role of the media and the literature in creating a gendered image of ICT among the youth

Golden

La formation scientifique des filles

2.2.2 Social model and family role

2.2.3 Peers pressure

3. Gender discrimination in the classroom

3.1 Subtle attitudes

3.1.1 From kindergarten, different expectations

3.1.2 Classroom chilly climate

3.2 Discrimination during science and computer studies

3.2.2 Being a woman in a male classroom

you

3.2.2 The lack of female professors and role models

Table 4: proportion of female teachers by level, full-time and part-time (ISCED 0-7) - I1 (%)

4. Discriminating advice and blurred careers

4.1 Effect of stereotypes on teachers and advisors

4.2 Students' wrong perceptions

4.2.1 Curricula and degrees needed

Table 5: graduate in ITEC occupation in the UK, 2000

4.2.2 Unknown jobs and skills in an evolving field

5. Gender differentiation of continued education

5.1 General trends as regard to access in continued education

Table 6: participation rates by gender and occupation, 1993

Gender	
Occupation[1]	

Table 7: gender comparison of training participation in Belgium

5.2 Access to continued education in IT fields

5.2.1 A general overview of the supply of training and disadvantages for women

5.2.2 Women training's content

Femmes et IT

Table 8: training for computer use at work (men/women)

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5.3 An increased importance of the human factor in IT jobs: an opportunity for women?

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La mixité dans la voie des métiers, un défi de l'égalité; maintenant, tous les métiers sont bi

The incredible shrinking pipeline

Helping Able Young Women Take Math and Science Seriously in School, New Voices in Counseling the Gifted

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High-tech industry zipping along, but women often are left behind

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Women still missing out on high-tech jobs

Girls and computer science: It's not me; I am not interested in sitting behind a machine all day

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Voices from the pipeline

A Comparative Analysis of Men and Women in Graduate Programs in Science, Engineering and Medicine at Stanford University

Chapter VII
Work organisation and working conditions

Marie-Pierre Moreau, FRPS (I)

Introduction

The Incredible Shrinking Pipeline
What Draws Women To and Keeps Women in Computing?

1. New working conditions and the issue of harmonisation

1.1 Working times and workspaces

1.1.1 New working times and multi localisation of work

Nouveaux rythmes de production, temps de travail et temps sociaux

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La pénurie d'informaticiennes, un défi pour l'égalité des chances

La pénurie d'informaticiennes, un défi pour l'égalité des chances

1.1.2 Impact of a few aspects of working conditions on the gender gap

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– *Societies and cultures*

– *Family and domestic sphere*

– *Educational sphere*

– *Labour market sphere*

– *Organisational sphere – organisation structures and practices of ICT work*

*

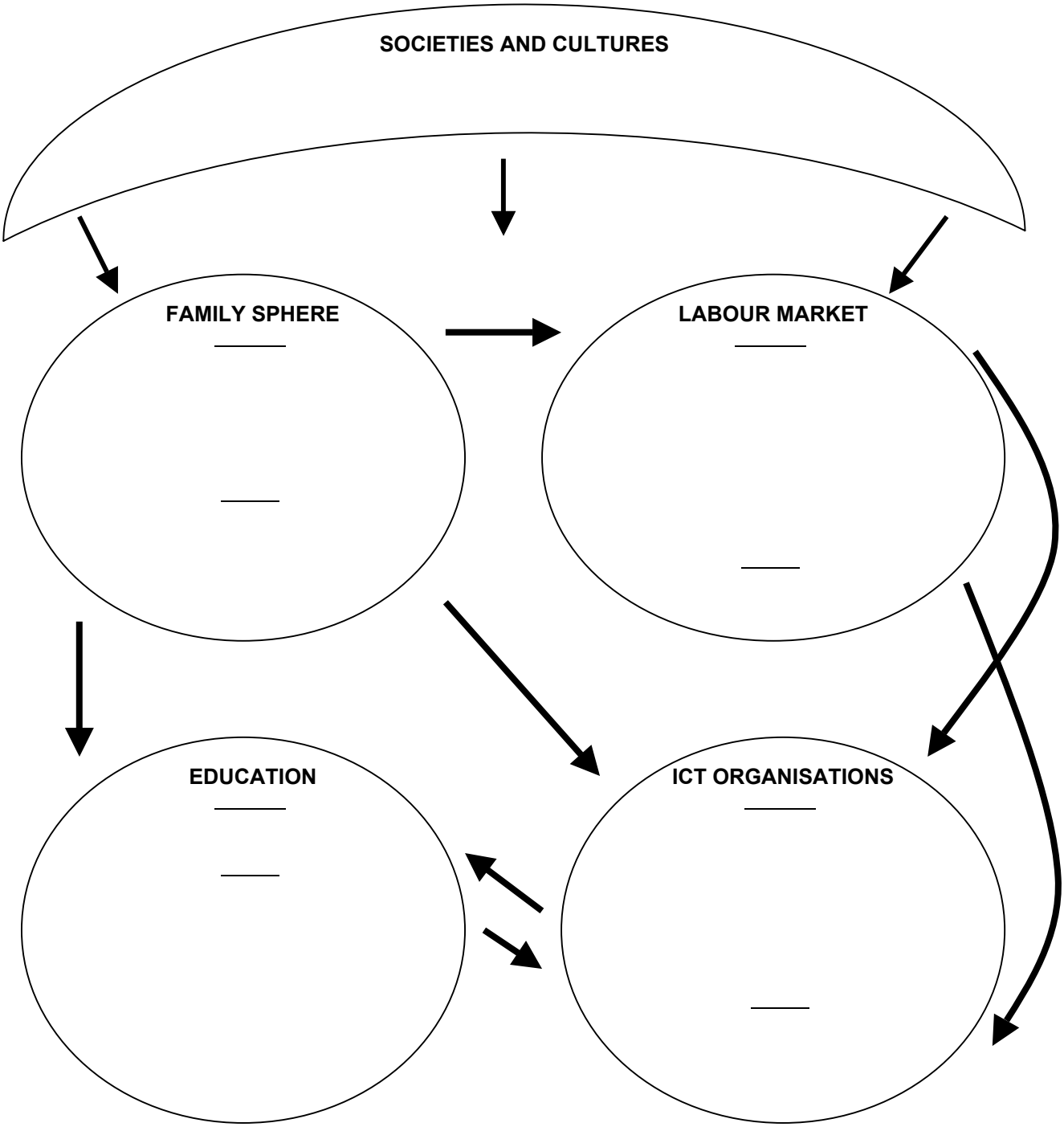
SOCIETIES AND CULTURES
FAMILY SPHERE
LABOUR MARKET
EDUCATION
ICT ORGANISATIONS

Table 1 **Social and Institutional Arrangements, Cultural Background**	

Table 2 **Family and Domestic Sphere**	

Table 3 **Educational Sphere**	
Within the school system:	
At post-school and university level:	

Table 4 **Labour Market Sphere**	
Women are discouraged or prevented from entering ICT jobs because:	
Women are prevented from or unlikely to reach senior levels in ICT work because:	

Table 5 **Organisational Structures and Practices in ICT Work**	

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