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Education and Culture

Key Data on Information and Communication Technology in Schools in Europe

2004 Edition

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Eurydice
The information network on education in Europe

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PREFACE

Improving the quality of education thanks to multimedia and Internet technology is one of the priorities of European cooperation. All schools, if not all classes, should be highly computerised, all teachers should be able to use the technology to enhance their working methods and all young people should be able to broaden their horizons by using it comfortably though with the necessary critical perspective. These goals are among the priority objectives for 2010 that the education and training systems of EU countries have set themselves in the follow-up to the Lisbon strategy.

Regular appraisals and detailed examination are required for greater insight into where we stand and how we are progressing. It is from this angle that the report prepared by Eurydice will prove most valuable.

This new edition of Key Data on Information and Communication Technology in Schools in Europe has for the first time broadened its sources of information to include empirical data collected in the international PISA and PIRLS surveys. From this it may be concluded that the level of computerisation in schools still varies widely from one country to the next. Indeed, there are also significant variations from one school to the next, particularly in countries in which the computerisation of schools is less developed. Efforts to achieve progress in this area should thus be sustained and selectively targeted. The report also reveals that a reasonable level of computerisation does not necessarily lead to the facilities being used on a regular basis. In some countries among those to have achieved a satisfactory level of computerisation, over 60 % of pupils questioned said they had never made use of the equipment available.

Access to adequate computer facilities is an essential but far from sufficient condition for achieving our aims. In the final analysis, our goal should be to develop the quality of teaching and learning. This latest edition of the report prepared by Eurydice sheds light more specifically on the use of the technology for educational purposes. Official recommendations regarding approaches, curricular objectives and teaching time in this field are examined and compared to how pupils say they actually use the technology. Relevant provision within initial teacher education and in-service teacher training is also described. The findings are encouraging: countries in which information and communication technology (ICT) was not a compulsory subject in the curriculum in 2002/03 are now exceptions to the rule. Yet substantial progress is still required in the area of teacher education. Teachers do not yet as a matter of course acquire skills in the use of ICT for educational purposes during their initial training, even though various in-service training programmes have been introduced.

Considerable effort has been invested by European countries in recent years in developing the educational use of ICT. I am certain that this edition of the Eurydice report, as well as its subsequent editions published once every two years, will provide very helpful food for thought on the part of policy-makers, researchers and all those who take an interest in the very rapid changes occurring in this field.

Viviane Reding

European Commissioner for Education and Culture

CONTENTS

NOTES FOR THE READER

INTRODUCTION

The 35 indicators in the present report are divided into five main chapters, namely Context, Structures and Organisation, Equipment, Teachers and Processes. This entirely subject-based structure replaces the presentation by level of education adopted for the previous edition of this report in 2001, and will be retained for future editions of it. Given the priority attached to the educational applications of information and communication technology (ICT) in EU cooperation, Eurydice will publish regular updates of these indicators whose range and detail will be gradually expanded, particularly as regards the use of ICT in teaching for which too little information is currently available.

Information from Eurydice offers an insight into the organisation of ICT teaching and teacher education. The reference year is 2002/03. Data from the PISA 2000 and PIRLS 2001 ([1]) international databases are used to expand on this information and to some extent compensate for the shortage of statistical material on ICT. These data offer a fairly clear picture of the level of home and school computerisation and on the disparities that may exist between schools within a given country. Furthermore, they provide some information about how computers are actually used both in terms of frequency and pupil activities.

These empirically collected PISA/PIRLS data also enable comparisons to be drawn with the official recommendations set out in the Eurydice material. They relate to the situation of pupils aged 9 or 10 in the fourth year of primary education (PIRLS) and those aged 15 (PISA).

With information on these two age-groups, it is possible to compare – if only as a rough guide – the primary and lower secondary levels of education (ISCED 1 and ISCED 2, respectively).

Notwithstanding the considerable effort made to combine different sources, the range of indicators here remains limited. On the one hand, the increased autonomy of schools in terms of both management and teaching methods means that it is very difficult to obtain detailed information on the basis of official recommendations. While information on general guidelines is often available, data on local action and schemes are less often collated at national level. On the other, readily comparable and reliable school statistics are still too scarce. No information matching these requirements is yet available as regards evaluation of the impact of ICT on teaching methods, the quality of education, or the competence of pupils and teachers, although these are essential aspects of the current concern with bringing ICT into education. As to the PISA and PIRLS data, they provide information almost solely on the level of computerisation and where computers are to be found. Neither the efficiency nor the obsolescence of equipment are considered, in spite of the rapid changes in this field. And no indicator examines for example other components of the computer environment such as software, printers or digital cameras, etc.

([1]) The glossary at the end of the report includes detailed information on the PISA and PIRLS international databases.

Three major questions underlie the summary of information taken from this report: what is known about computer facilities at school and in the home; what is known about access to them and how they are used; and what is known about how teachers are trained in the field of ICT?

Computer facilities at school and in the home: an overview

Between 5 and 20 pupils per computer among 15-year-olds

In 2000, the level of school computerisation still appeared to vary widely from one country to the next. The average number of pupils per computer is one of several pointers to the level of school computerisation in a country. In most countries, the average ratio varies between 5 and 20 pupils per computer among 15-year-olds (Figure C2). It should be noted that certain countries with an exceptionally high ratio in 2000 (Greece and Portugal in particular) set out to steadily reduce it.

A comparison of these ratios with official recommendations regarding investment in computerisation (Figure C1) provides some insight into the statistical data. In a few countries in which the guidelines establish a maximum number of pupils per computer, this number corresponds to the ratio calculated using empirical data. Within those countries, there is very little disparity between schools. By contrast, where the regulations advocate the installation of one special room with computer facilities per school irrespective of its size (as in Poland for example), small schools are likely to be at an advantage.

The percentage of young people who claim to have a home computer varies from 20 % to over 90 % throughout Europe

The level of computerisation among the families of young people aged 15, when measured on the assumption that they have at least one computer at home, also varies widely from one country to the next (Figure A2). And there is a broad correlation between this level and the level of school computerisation (Figure C3). In the Nordic countries, over 90 % of pupils aged 15 have a computer at home. By contrast, in the countries of eastern Europe for which data are available, the proportion rarely exceeds 50 %.

The situation is not dissimilar in the families of young people aged 9 or 10.

The level of Internet connections is always lower than the level of computerisation

The level of school Internet connections is directly related to the scale of computerisation (Figure C5). These levels are especially high in countries in which schools possess a large number of computers. Similarly, the level of home Internet penetration is also dependent on the domestic level of computerisation (Figure A3).

Internet connections everywhere are always lower than the level of computerisation, although to an extent that varies. This state of affairs is no doubt partly due to differences between countries in the cost of connections and the variable levels of efficiency achieved by computers.

A recurrently direct relation between national prosperity and the development of school and home computer facilities

Within a given country, the number of pupils per computer may vary considerably from one school to the next. This applies in particular to countries in which the level of school computerisation is relatively modest, and which also have a low GDP (Figure C6).

As in the case of school computerisation, the level of domestic computerisation is also linked to GDP (Figure A1).

Two main stages in school computerisation: computer facilities first for staff, then for pupils, …

School computerisation occurs along fairly similar lines from one country to the next. In the initial stage, computer facilities are intended mainly for administrative and teaching staff. Thus in countries with only a modest level of school computerisation (and a high number of pupils per computer), teaching and administrative staff may access facilities more readily than pupils (Figure C4).

… provide pupils with access to facilities first outside the classroom, and then also within it

In the same countries, pupils may generally access computer facilities in special rooms for this purpose away from the classroom, whereas in schools in countries in which computerisation has reached a more advanced stage, the computers may be located both within classrooms and outside them (in a special room offering computer facilities or a multimedia library) (Figure C9).

Use of computer facilities at school and in the home

An integrated approach to the use of ICT is the norm. It is supplemented by courses in ICT as a subject in its own right in secondary education

ICT is part of the compulsory minimum curriculum of pupils virtually everywhere in Europe. In primary education, just seven countries have not included ICT in the compulsory curriculum and this situation is even more of an exception in secondary education (Figure B3).

In addition, official recommendations regarding the approaches to be adopted are fairly similar from one country to the next. In primary education, ICT is used primarily as a tool for other subjects (Figure B2). In secondary education and especially at upper secondary level, this approach is supplemented by the teaching of ICT as a subject in its own right.

Among the official aims of the curriculum, activities involving the use of software, information searches and communications networks for extending knowledge of various subjects are uniformly the most representative, irrespective of the level concerned in compulsory education (Figures B4, B5 and B6).

In many countries, the amount of time set aside for ICT is flexible (Figure B7). Only in a few countries and particularly those of central and eastern Europe do the official regulations specify a minimum annual number of hours to be earmarked for teaching ICT as a subject in its own right (ISCED 2 and 3).

The frequency with which ICT is used in schools rises markedly with the age of young people

Pupils aged 9 or 10 say that they do not use computers very often at school (Figure E3). Nearly half even consider that they use them never or almost never. Only in a few countries (in particular the United Kingdom and Iceland) do a high percentage of schoolchildren claim to use computers very regularly.

By contrast, almost two-thirds of their elders aged 15 say that they use computers very regularly at school (Figure E1). However it is true that considerable degrees of variation are apparent and in a few countries (French Community of Belgium, Germany and France), the majority of 15-year-old pupils say they never or almost never use computers at school.

Generally speaking, computers are used least frequently in countries in which the number of pupils per computer is high (with the exception of Bulgaria), although infrequent use is also reported by countries with a high level of computerisation. A limited number of computers at school does not therefore necessarily inhibit the satisfactory implementation of computer activities, and vice versa.

Although use of the Internet by 15-year-olds is not as frequent as their use of computers (Figure E2), general trends in both cases are much the same. Frequency of Internet use is especially high in five countries (Denmark, Austria, Finland, Sweden and Iceland).

Children everywhere are able to access home computers, irrespective of the level of home computerisation

Families generally make it easy for children aged 9 or 10 to access the home computer. The percentages of children in this age-group who say they have a computer at home and the percentages who say they are able to use it very regularly are indeed very close (Figure A4). This applies to all countries surveyed and is thus irrespective of the level of home computerisation. Otherwise put, even in countries with low levels of home computerisation (Bulgaria in particular), the great majority of families with a computer allow their children to use it.

At school, writing activity and information searches using ICT are typical of children aged 9 or 10. In the home, computer games are the main activity

In most countries, when pupils aged 9 or 10 work with ICT at school, this is mainly to write something or to search for information (Figure E4). These activities correspond fairly closely to the aims and recommendations set out in official curricula for primary education (Figure B4).

At home, on the other hand, the great majority of children in the foregoing age-group use computers (excluding consoles and portable equipment) to play games. The percentage of those who say they search for information and write remains high however in several countries (Figure A6).

Training teachers for ICT

Teachers in secondary education are often supported by ICT specialists

In many countries, irrespective of whether the curriculum offers ICT as a subject in its own right or as a tool for teaching other subjects, teachers are assisted by ICT specialists (Figure D1). This practice is especially widespread in secondary education.

These specialist teachers have in general received initial education lasting four or five years at university level. In many countries, fully qualified teachers are also able to extend their skills in this field and thereby acquire a specialist qualification (Figure D2).

Basic training for teachers in the educational use of ICT

In addition to this support, teachers in primary and secondary education in most countries have received basic training during initial teacher education in the use of ICT for educational purposes. This part of their initial education may or may not be compulsory depending on the country concerned (Figures D3 and D4).

Official recommendations concerning training for teaching ICT are rarely detailed

In many countries, institutions of teacher education are largely free to determine the content of this training as they wish. Furthermore, where official recommendations are more detailed, they vary very widely from one country to the next (Figures D5 and D6).

The amount of time spent on ICT in initial teacher education is also entirely at the discretion of the institutions in the majority of countries. In eight countries or administrative communities (French Community of Belgium, Spain, Luxembourg, Austria, Sweden, Iceland, Lithuania and Malta) a specific number of hours is officially recommended (Figure D7).

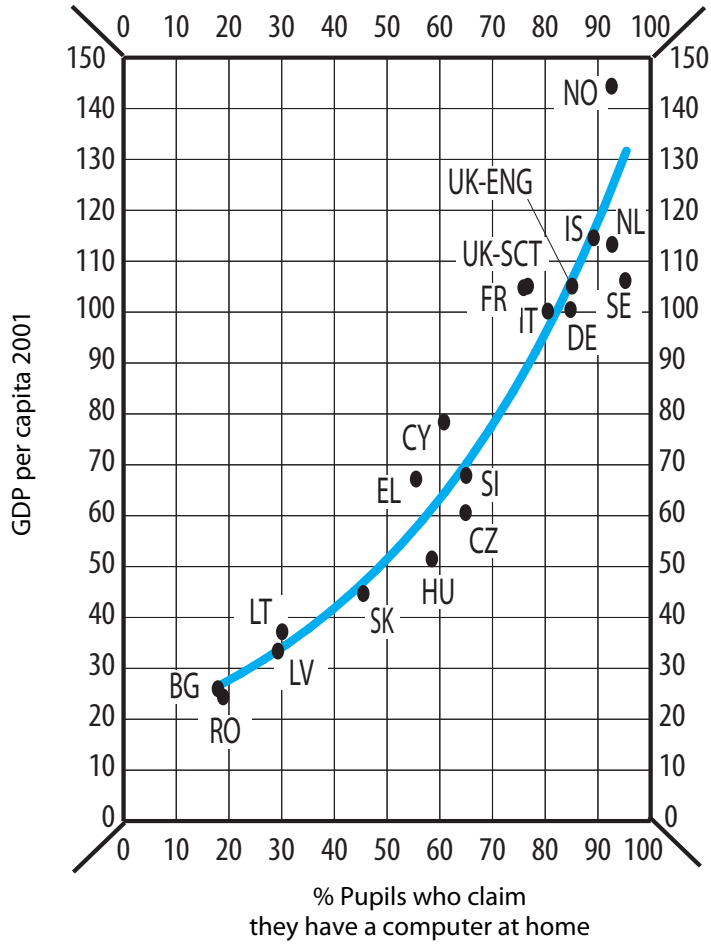
In the majority of countries, the acquisition or upgrading of ICT skills is encouraged in in-service teacher training. National programmes (of variable length but generally lasting at least two years) encourage this type of training for teachers at the primary and secondary levels of education.

A CONTEXT

A CLEAR PARALLEL BETWEEN THE EVOLUTION OF THE HOME COMPUTING ENVIRONMENT AND NATIONAL WEALTH

The more the GDP per capita rises, the higher the percentage of pupils claiming to have a computer at home. In 2000, the correlation coefficient (0.95) pointed to a clear direct relationship between the two variables. In other words, a direct relation could be observed in Europe between the importance of the home computing environment and the level of national wealth.

Figure A1: Relationship between the percentage of pupils (grade 4) who claim they have a computer at home and the GDP per capita expressed in PPS, 2000/01



	X	Y
DE	84.6	100.5
EL	55.3	67.2
FR	75.7	104.8
IT	80.3	100.2
NL	92.5	113.3
SE	95.0	106.2
UK-ENG	84.9	105.1
UK-SCT	76.5	105.1
IS	89.0	114.6
NO	92.4	144.4
BG	17.7	26.0
CZ	64.7	60.6
CY	60.6	78.4
LV	29.1	33.4
LT	29.9	37.2
HU	58.3	51.5
RO	18.7	24.4
SI	64.8	67.9
SK	45.3	44.7

Source: IEA, PIRLS database 2001; GDP 2001: Eurostat, data extracted in February 2004.

Explanatory Note

The definition of a correlation and its calculation method are given in the statistical tools glossary at the end of the report.

The definition of a computer excludes game consoles and TV/video computer game equipment.

In each country, the level of home computer ownership among the families of pupils varies not only in accordance with national wealth, but also in accordance with family wealth. The level of computer equipment correlates to the socio-economic level as well as the qualification level of the parents, as shown in annex 1.

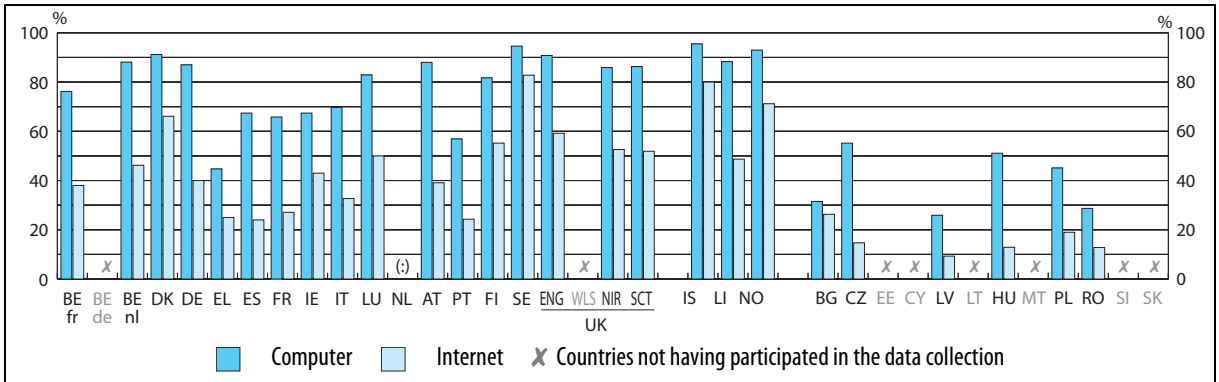
HOME COMPUTER AND INTERNET PENETRATION MAY BE TWICE AS GREAT IN SOME CASES AS IN OTHERS

In the majority of European countries, particularly the Scandinavian and German-speaking countries, more than 80 % of 15-year-old pupils state that they have a computer at home. The Eastern European countries for which data are available are mainly below the values in most of the other countries.

The percentage of families connected to the Internet is always lower than that of families with a computer. These differences can sometimes be very marked. The percentage of pupils who claim they have an Internet connection is highest in the Scandinavian countries and almost as high in the United Kingdom (England, Northern Ireland and Scotland). In sixteen countries, less than half of the families of 15-year-old pupils with a computer have an Internet connection. In Greece, Spain, France, Portugal and Bulgaria, less than a third has a connection and between 10 to 15 % in the Czech Republic, Latvia, Hungary and Romania.

It may be supposed that, besides the variable development rates of computer culture between countries, these differences in Internet penetration in families are partly attributable to the prices charged by the telecommunications companies for an ADSL which may be more affordable in some countries.

Figure A2: Percentage of 15-year-old pupils who claim to have a computer and an Internet connection at home, 1999/2000



	BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
Computer	76.2	88.1	91.2	87.0	44.7	67.4	65.8	67.4	69.7	82.9	(:)	88.0	56.9	81.7	94.6	90.8	85.9	86.3	95.5	88.3	93.0	31.5	55.2	25.9	51.1	45.1	28.7
Internet	38.0	46.2	66.1	40.0	25.0	24.0	27.1	43.0	32.7	50.0	(:)	39.1	24.3	55.2	82.8	59.2	52.6	51.9	80.0	48.7	71.2	26.3	14.7	9.3	12.9	19.0	12.8

Source: OECD, PISA 2000 database.

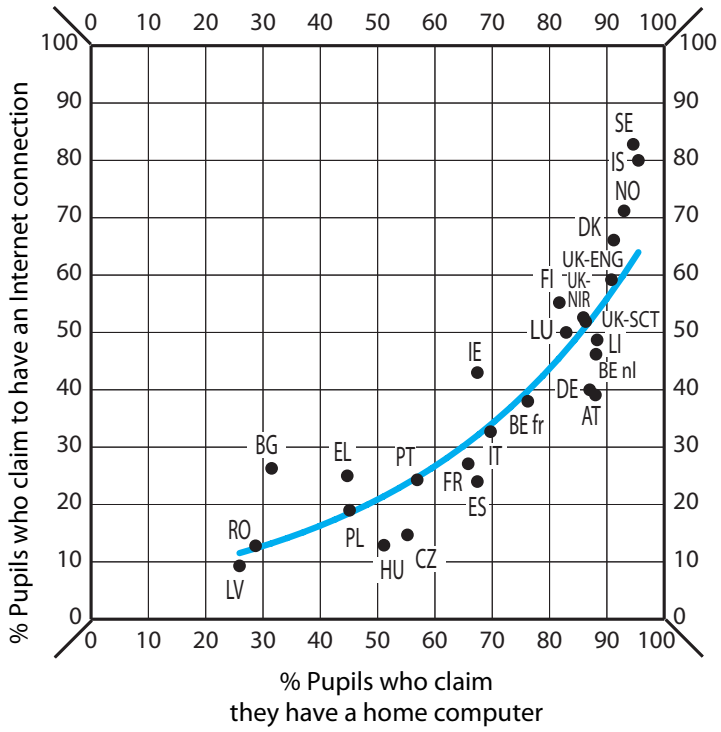
Additional note

Netherlands: The response rate to the PISA 2000 survey was considered to be too low for purposes of meaningful comparison. This explains why the data (computer = 95.4; Internet = 61.3) are not shown in the Figure. See the glossary for further details.

THE SPREAD OF THE INTERNET GENERALLY FOLLOWS THE EVOLUTION OF COMPUTER EQUIPMENT IN THE HOMES OF 15-YEAR-OLDS

The relationship between the percentage of 15-year-old pupils who claim to have an Internet connection and a home computer is presented in Figure A3. It details and completes Figure A2. In the majority of countries, the rate of Internet penetration depends on the rate at which the families of 15-year-olds acquire home computers. Thirteen countries are marked by a percentage lower than the expected value (represented by the curve). This tendency is particularly significant in the Czech Republic and Hungary. The figure also shows that, in other countries, the percentage of pupils with an Internet connection is slightly higher than that expected given the number of pupils who have a computer. It is in Ireland, Sweden and Bulgaria that the difference is most marked.

Figure A3: Relationship between the percentage of pupils aged 15 who claim to have a home computer and Internet connection, 1999/2000



	X	Y		X	Y
BE fr	76.2	38.0	**IS**	95.5	80.0
BE nl	88.1	46.2	**LI**	88.3	48.7
DK	91.2	66.1	**NO**	93.0	71.2
DE	87.0	40.0			
EL	44.7	25.0	**BG**	31.5	26.3
ES	67.4	24.0	**CZ**	55.2	14.7
FR	65.8	27.1	**LV**	25.9	9.3
IE	67.4	43.0	**HU**	51.1	12.9
IT	69.7	32.7	**PL**	45.1	19.0
LU	82.9	50.0	**RO**	28.7	12.8
NL	(:)	(:)			
AT	88.0	39.1			
PT	56.9	24.3			
FI	81.7	55.2			
SE	94.6	82.8			
UK-ENG	90.8	59.2			
UK-NIR	85.9	52.6			
UK-SCT	86.3	51.9			

Source: OECD, PISA 2000 database.

Additional note

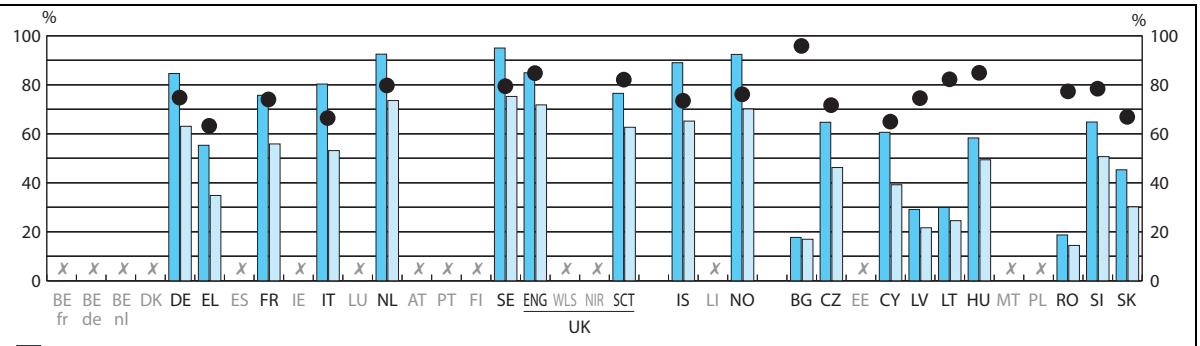
Netherlands: The response rate to the PISA-2000 survey is considered to be too low for purposes of meaningful comparison. This explains why the data (computer = 95.4; Internet = 61.3) are not shown in the Figure. See the glossary for further details .

EASY ACCESS TO THE HOME COMPUTER FOR NINE OR TEN-YEAR-OLD CHILDREN

In all the countries surveyed, when a family has a computer, nine or ten-year-old children can make use of it regularly. Everywhere, more than 60 % of children say they use it at least once a week. The proportion is similar in all countries and is therefore independent of the level of computerisation.

Thus in Bulgaria, Latvia, Lithuania and Romania, the percentage of grade 4 pupils with a computer at home remains marginal (between 17.7 % and 29.9 %), but the majority of them have access to it. This situation is particularly significant in Bulgaria where the proportion of children with access to a computer rises to more than 95 %. It is in Greece and Cyprus that the percentage of children with access to a home computer is the lowest.

Figure A4: Percentage of pupils (grade 4) who have a computer at home and percentage of pupils who claim to use it at least once a week, 2000/01



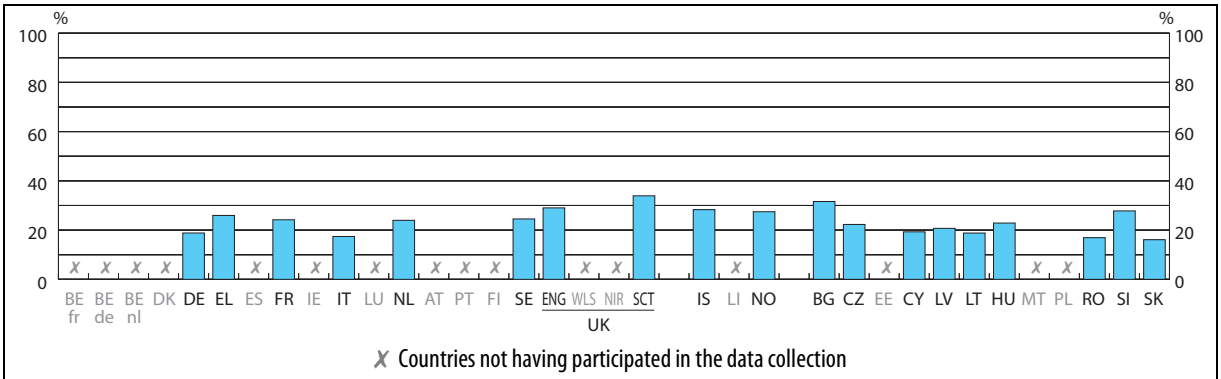
	DE	EL	FR	IT	NL	SE	UK-ENG	UK-SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
A	84.6	55.3	75.7	80.3	92.5	95.0	84.9	76.5	89.0	92.4	17.7	64.7	60.6	29.1	29.9	58.3	18.7	64.8	45.3
B	63.0	34.8	55.8	53.1	73.6	75.2	71.8	62.7	65.2	70.1	16.9	46.2	39.2	21.6	24.5	49.4	14.4	50.7	30.2
B/A	74.5	63.0	73.8	66.2	79.5	79.2	84.6	81.9	73.2	75.9	95.7	71.4	64.7	74.3	82.0	84.7	77.1	78.2	66.6

Source: IEA, PIRLS 2001 database.

IN ALL COUNTRIES, A RATHER SIMILAR PROPORTION OF NINE OR TEN-YEAR-OLD CHILDREN USE A COMPUTER AWAY FROM THE SCHOOL OR FAMILY

In all the countries concerned, on average 23 % of grade 4 pupils use a computer at least once a week on average in a place other than the home or the school. Seeking other places of access, is observed in a rather constant way in all the countries. The percentages are slightly higher in the United Kingdom (England and Scotland), Iceland, and Bulgaria. The probability that grade 4 children use a computer in a place other than the home or school is thus independent of the country's level of computerisation (Figure A1).

Figure A5: Percentage of pupils (grade 4) who use a computer at least once a week in a place other than the home or school, 2000/01



DE	EL	FR	IT	NL	SE	UK-ENG	UK-SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
18.8	26.0	24.2	17.4	24.0	24.5	29.0	33.9	28.3	27.5	31.6	22.3	19.3	20.7	18.8	22.9	16.9	27.8	16.1

Source: IEA, PIRLS 2001 database.

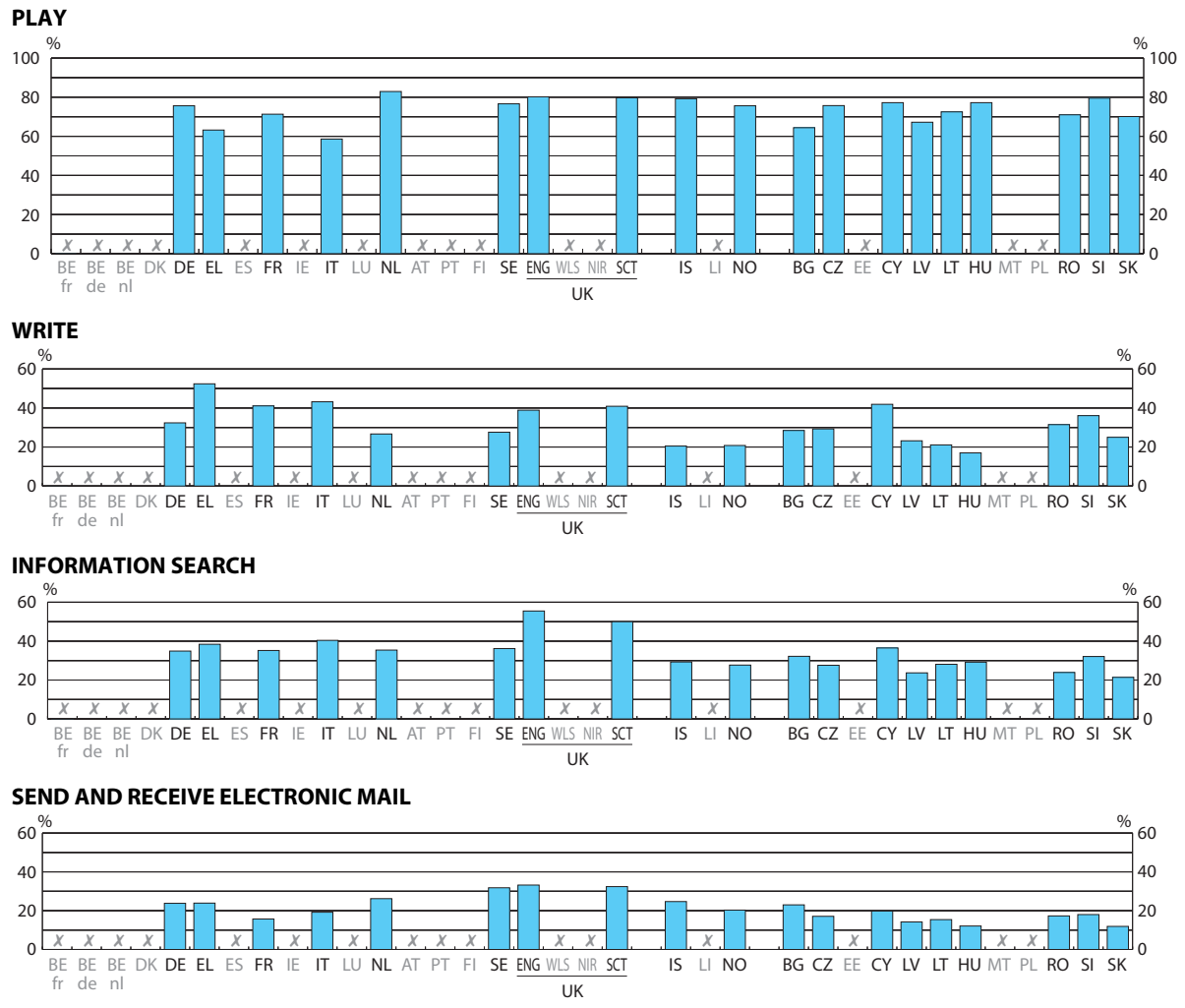
PLAY IS THE PRINCIPAL COMPUTER USE FOR NINE OR TEN-YEAR-OLD CHILDREN

Whatever the country concerned and independently of the computer penetration rate, the majority of grade 4 pupils use computers for play (73.6 % on average). These proportions are particularly high in the Netherlands, the United Kingdom (England and Scotland) and Slovenia. In three countries, they are definitely lower than the average of all countries. This is the case for Greece, Italy, and Bulgaria.

Word processing and information search facilities are also used by children to a lesser extent. These two categories present rather similar percentages (31.5 % and 33.6 % on average respectively). For these two types of computer use, the highest rates are observed in Greece, Italy, and the United Kingdom. As regards information searching, the lowest rates are in Iceland, Norway, Latvia, Romania, and Slovakia. However, the rates lie above 20 % in all those countries.

The use of electronic mail is relatively less frequent; on average 21 % of nine- or ten-year-old children exchange e-mail at least once a week. In Sweden and the United Kingdom (England and Scotland), approximately a third use electronic mail. A little more than 10 % use it in France, Hungary, and Slovakia.

Figure A6: Percentage of pupils (grade 4) who use the computer at home at least once a week to play, write, search for information or exchange e-mail, 2000/01



✗ Countries not having participated in the data collection

							UK												
	DE	EL	FR	IT	NL	SE	ENG	SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
Play	76	63	71	59	83	77	80	80	79	76	64	76	77	67	73	77	71	80	70
Write	32	52	41	43	27	28	39	41	21	21	29	29	42	23	21	17	32	36	25
Information Search	35	38	35	40	35	36	56	50	29	28	32	28	37	24	28	29	24	32	21
Send and receive electronic mail	24	24	16	19	26	32	33	32	25	20	23	17	20	14	15	12	17	18	12

Source: IEA, PIRLS 2001 database.

B

STRUCTURES AND ORGANISATION

NATIONAL OR OFFICIAL BODIES ARE RESPONSIBLE FOR SUPERVISING AND/OR PROMOTING ICT POLICY

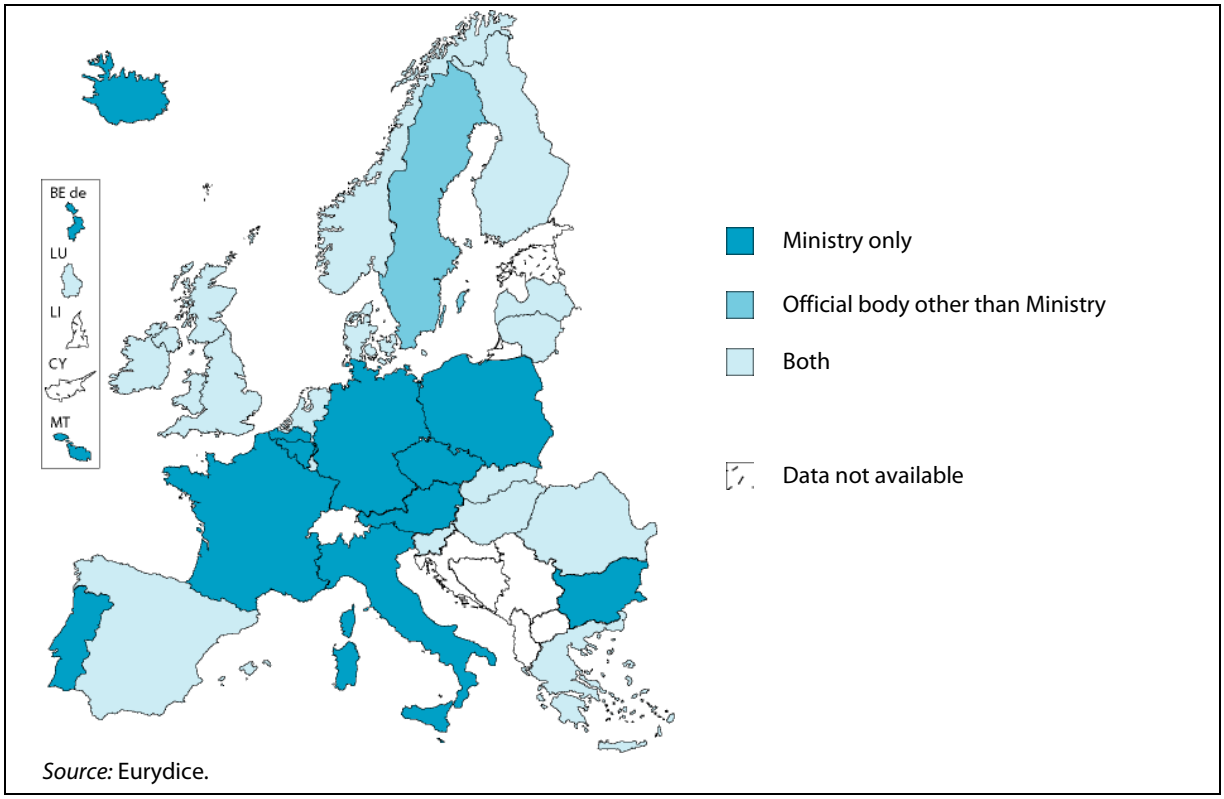
In all European countries, one or more national or public bodies are responsible for implementing or promoting official ICT-related initiatives.

The number of these bodies varies from country to country, but their tasks normally include some or all of the following: they define the objectives to be pursued; they organise continuous professional development for teachers and develop new software and multimedia support; they monitor and coordinate the various initiatives and projects implemented in the area of ICT in education; and they are responsible for the application of the decisions taken and the agreements concluded.

In most countries, it is the Ministry or the highest decision-making authority in education matters which takes over this role. However, in sixteen countries there is at least one additional official body which takes co-responsibility. In most cases, this is either a body for coordinating educational activities in general terms or specifically put in place for ICT or a higher education institution. It is only in Sweden, that there is an official body which manages all ICT-related matters, independently from the ministry. This body also has an advisory role for the government.

The names of the responsible bodies and their websites are available in the annex 2.

Figure B1: National or official bodies responsible for supervising and/or promoting national policy for ICT in education, 2002/03

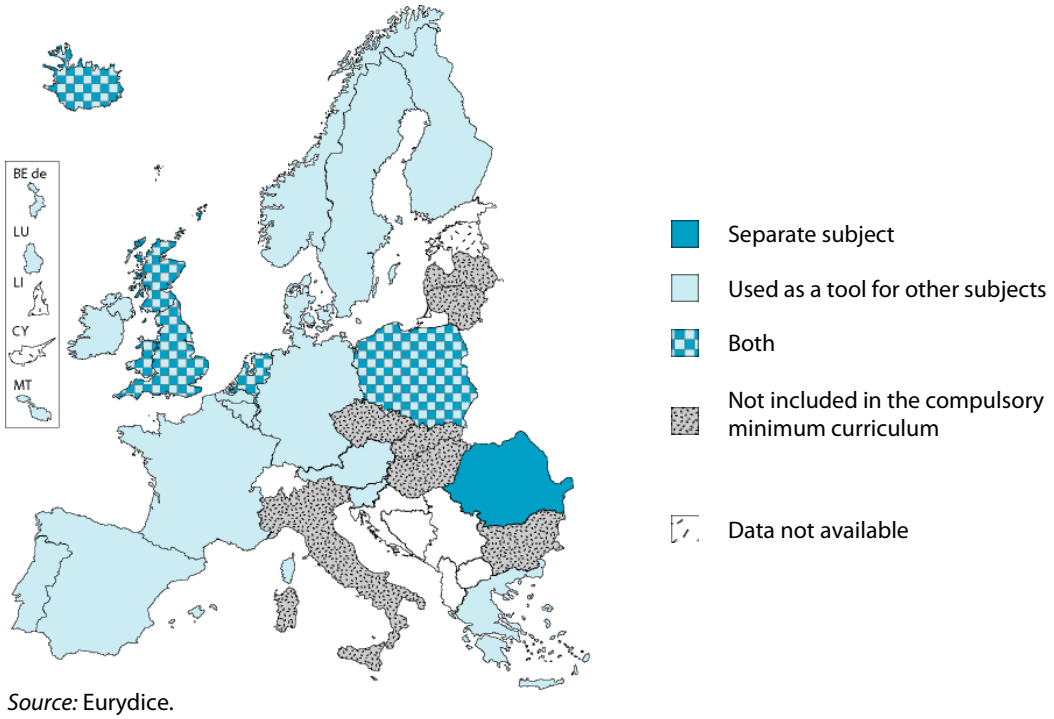


Source: Eurydice.

THE MOST PREFERRED APPROACH IN PRIMARY EDUCATION IS TO USE ICT AS A TOOL

At this level of education, ICT is part of the compulsory minimum curriculum in most European countries, except in Italy, Bulgaria, the Czech Republic, Latvia, Lithuania, Hungary and Slovakia. When ICT is included in the core curriculum, two main approaches may be distinguished. It may be taught as a separate subject in its own right, or used as a tool for other subjects and in some cases both. To use ICT as a tool is the most widespread approach in the European countries as far as the curriculum for primary education is concerned.

Figure B2: Approaches to ICT defined in the compulsory minimum curriculum. Primary education (ISCED 1), 2002/03



Source: Eurydice.

Additional notes

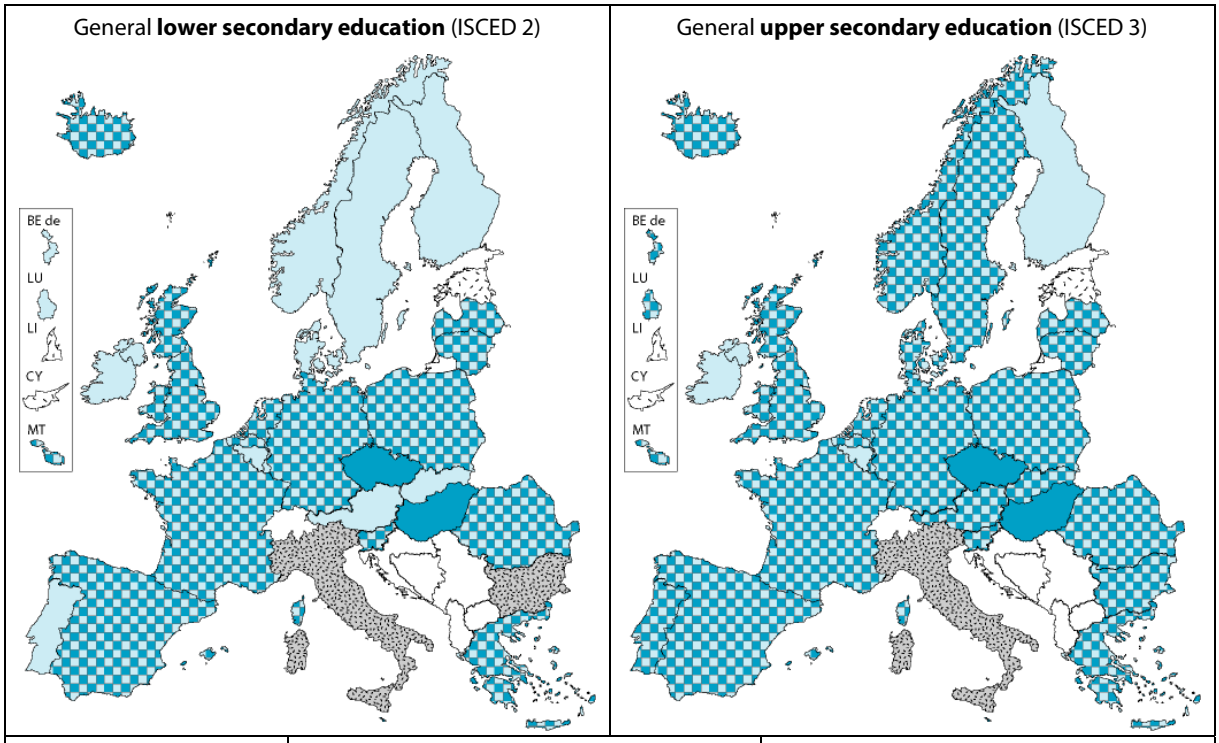
Greece: ICT is one of the compulsory subjects offered to All Day Primary School pupils for 2 teaching periods/week. 2.700 'All Day Primary Schools' have been established since October 2002. This type of school is not compulsory and is for primary pupils who wish to stay for 3 more hours at school every day.
France: In the new primary education curricula that have been gradually implemented since the beginning of the 2002 school year, discovering and learning about ICT have been introduced to support work on a group of subjects from the first year of primary school onwards.
United Kingdom (ENG/WLS): ICT is specified as a separate compulsory subject within the National Curriculum. However, the way in which it is taught is a matter for the school; this might be by separate ICT lessons, by cross-curricular teaching or a combination of both.
United Kingdom (NIR): Although it is not specified as a separate subject, separate teaching objectives for ICT are included within the statutory requirements for all individual subjects.
Hungary: The curriculum recommends basic preparation for information society, but no lessons are compulsory. Non-compulsory ICT courses are possible.

In addition to its use as a tool, ICT is a separate compulsory subject in a few countries, namely the Netherlands, the United Kingdom (with the exception of Northern Ireland), Iceland and Poland. In Romania, it is included in the curriculum solely as a subject in its own right.

IN SECONDARY EDUCATION ICT IS OFTEN INCLUDED IN THE CURRICULUM AS BOTH A TOOL AND A SEPARATE SUBJECT

At secondary education level, ICT forms part of the compulsory curriculum in all countries except for Italy (lower and upper secondary level) and Bulgaria (lower secondary level). In most cases, national curricula combine the two approaches to ICT (as a separate subject and its use as a tool for other subjects), and recommend or lay down that the teaching of ICT as a subject should be supplemented by its use for introducing other subjects or carrying out interdisciplinary projects. This trend is slightly more pronounced at upper secondary than at lower secondary level.

Figure B3: Approaches to ICT defined in the compulsory minimum curriculum. General secondary education (ISCED 2 and 3), 2002/03



Source: Eurydice.

Additional notes

Spain: One of the aims of the new common core curriculum for compulsory secondary education is the acquisition of skills related to the use of ICT, so that they may be used as a learning tool in the different subjects. ICT also exists as a compulsory subject in its own right in the first two years of compulsory secondary education. In the common core curriculum for *Bachillerato*, ICT will be used as a learning tool in the different subjects and will be included as an independent subject in the type of *Bachillerato* known as Sciences and Technology.
France: In the first year of upper secondary education, ICT is a core curriculum option.
Luxembourg: In technical secondary education, initiation to ICT is a separate subject. In all other types of lower secondary education, ICT are used as a tool for learning and teaching. ICT is a separate subject in certain vocational programmes in technical upper secondary education and in the mathematics/information technology stream of upper secondary education from the school year 2004/05.

Additional notes (continued)

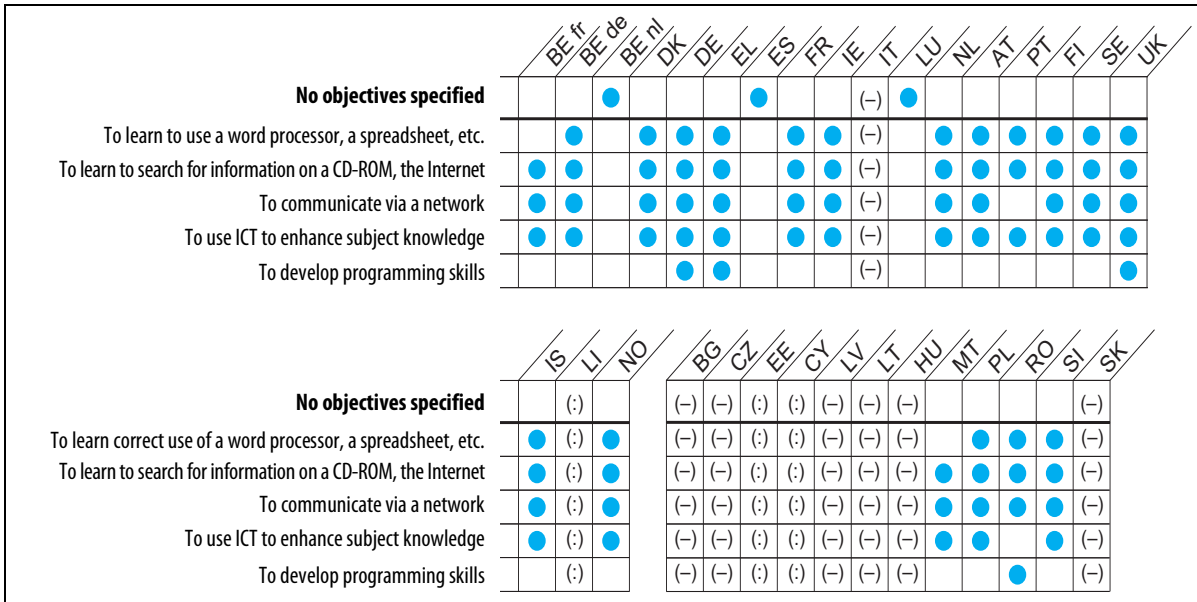
Austria: Curricular school autonomy made it possible to establish autonomous focuses. Therefore, in about 20 % of *Hauptschulen* and in about 80 % of *Polytechnische Schulen* ICT is a separate subject. In the AHS, it may be offered as a core curriculum option in grades 10, 11, and 12.
Portugal: A new subject ICT will be introduced in the curriculum of the 9th and 10th grades in 2003/04.
Sweden: ICT is a separate subject in certain upper secondary education curricula.
United Kingdom (ENG/WLS/NIR): In England and Wales, ICT is specified as a separate subject within the National Curriculum. However the way in which it is taught is a matter for the school; this might be by ICT lessons, by cross-curricular teaching or a combination of both. In *Key stage 4* (the first two years of upper secondary education), ICT is a separate compulsory subject in England only, but it is also widely taught in Wales. In Northern Ireland, it is not specified as a separate subject, but specific teaching objectives for ICT are included within the statutory requirements for all individual subjects. In post-compulsory education, there is no compulsory curriculum throughout England, Wales and Northern Ireland.
Czech Republic: In lower secondary education (*základní škola* programme), ICT is an optional subject that can be included in the curriculum at the discretion of the school head. Since the 1st September 2001 classes with extended teaching of ICT could be established, meaning that ICT is introduced as a separate compulsory subject. In general upper secondary education it is a compulsory subject in the first year (15 years), it can be included in the curriculum in the subsequent years at the discretion of the school head.
Slovenia: In lower secondary education, ICT as a separate subject is offered as a core curriculum option.
Slovakia: In lower secondary education, ICT is an optional subject that can be included in the curriculum at the discretion of the school head. ICT is a separate compulsory subject in the mathematics/sciences or technical stream.

ICT is only taught as a separate subject in its own right in a few countries (the Czech Republic and Hungary). In Sweden and Norway, it is used exclusively as a tool for other subjects at lower secondary level, and in Ireland and Finland throughout the whole secondary education cycle. In Finland, schools define their curricula based on the national core curriculum. However, ICT is widely offered as an optional subject and in some schools it may be compulsory.

INFORMATION SEARCHES AND NETWORK COMMUNICATION OFTEN INCLUDED AT PRIMARY LEVEL

Whatever the approach advocated, the objectives pursued by the teaching or use of ICT can cover various categories. Five major fields are distinguished here, namely the use of software, information searches and communication via a network, and the use of ICT to enhance subject knowledge as well as the development of programming ability.

Figure B4: Objectives defined in the compulsory minimum curriculum for the teaching or the use of ICT. Primary education (ISCED 1), 2002/03



(–): ICT is not included in the compulsory curriculum at this level of education.

Source: Eurydice.

Additional notes

Belgium (BE nl): By the end of primary school, pupils are required to be able to use ICT and to process data.
Sweden: The skills to be acquired are not listed explicitly in the curricula, but understood to include the areas indicated above.
United Kingdom (NIR): The curriculum, which makes no specific mention of 'communication via a network', is currently under review.

Explanatory note

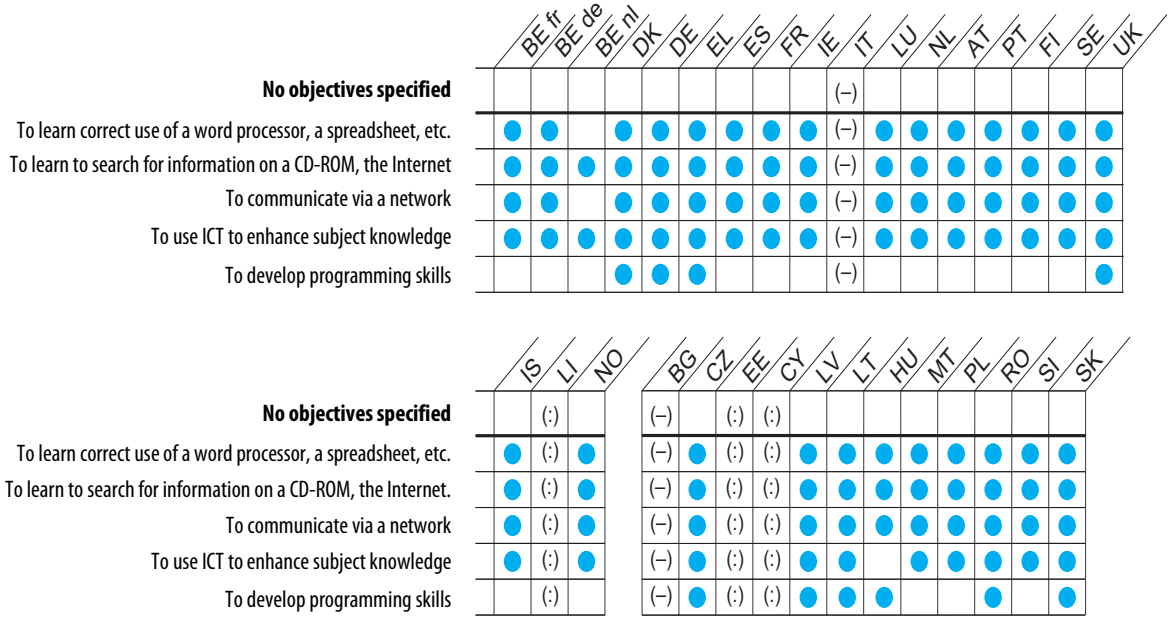
The development of programming skills may include understanding the logic on which computers are based, and/or the acquisition of basic skills needed to write simple computer programmes.

With the exception of Belgium (Flemish Community), Spain and Luxembourg in which no objective is clearly specified, the recommendations generally cover several categories of objectives. However, only a few countries (Germany, Greece, the United Kingdom and Romania) include the development of programming ability in the curricula at this level of education.

THE RANGE OF DETAILED CURRICULAR OBJECTIVES IS QUITE BROAD AT SECONDARY LEVEL

In the case of secondary education, all countries have established detailed recommendations. In general, the objectives of the courses in ICT at lower secondary level relate to four of the five categories shown in Figure B5. The development of programming skills at this level of education is specified in only ten countries. In Belgium (Flemish Community) only two objectives are specified.

Figure B5: Objectives defined in the compulsory minimum curriculum for the teaching or use of ICT. General lower secondary education (ISCED 2), 2002/03



(–): ICT is not included in the compulsory curriculum at this level of education.

Source: Eurydice.

Additional notes

Finland: The curricula are designed at the local level based on the national core curriculum. The schools determine the objectives and what is to be taught, based on the national guidelines.
Sweden: The skills to be acquired are not listed explicitly in the curricula, but understood to include the areas indicated above.
United Kingdom (NIR): The curriculum, which does not make specific mention of communication via a network, is under review.
Lithuania: In January 2002, the Pupils' General Computer Literacy Standard was adopted. The Standard elaborates computer literacy requirements, which are planned to be implemented in the Lithuanian general lower and upper secondary school until 2006.
Malta: Optional courses to develop programming skills may be offered.

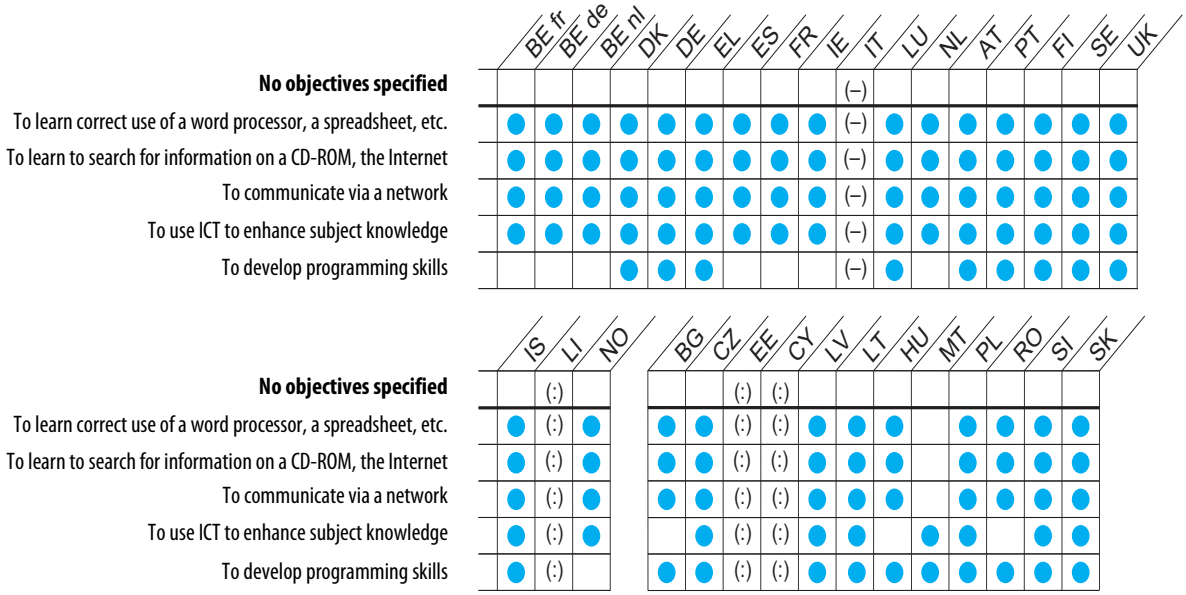
Explanatory note

The development of programming skills may include understanding the logic on which computers are based, and/or the acquisition of basic skills needed to write simple computer programmes.

PROGRAMMING IS GENERALLY INCLUDED IN CURRICULA AT UPPER SECONDARY LEVEL

In general upper secondary education, most countries pursue all categories of objectives shown in Figure B6. Only in Belgium, Spain, France, Ireland, the Netherlands and Norway is the development of programming skills not specified at this level of education.

Figure B6: Objectives defined in the compulsory minimum curriculum for the teaching or the use of ICT. General upper secondary education (ISCED 3), 2002/03



(–): ICT is not included in the compulsory curriculum at this level of education.

Source: Eurydice.

Additional notes

Finland: The curricula are designed at the local level based on the national core curriculum. The schools determine the objectives and what is to be taught, based on the national guidelines.
Sweden: The skills to be acquired are not listed explicitly in the curricula, but understood to include the areas indicated above.
Sweden and **Malta**: Optional courses to develop programming skills may be offered.
United Kingdom (ENG/WLS/NIR): In *Key stage 4* (the first two years of upper secondary education), ICT is a separate compulsory subject in England only, but it is also widely taught in Wales. In Northern Ireland, the curriculum, which does not make specific mention of communication via a network, is under review. In post-compulsory education, there is no compulsory curriculum throughout England, Wales and Northern Ireland.
Lithuania: In January 2002, the Pupils' General Computer Literacy Standard was adopted. The Standard elaborates computer literacy requirements, which are planned to be implemented in the Lithuanian general lower and upper secondary school until 2006.

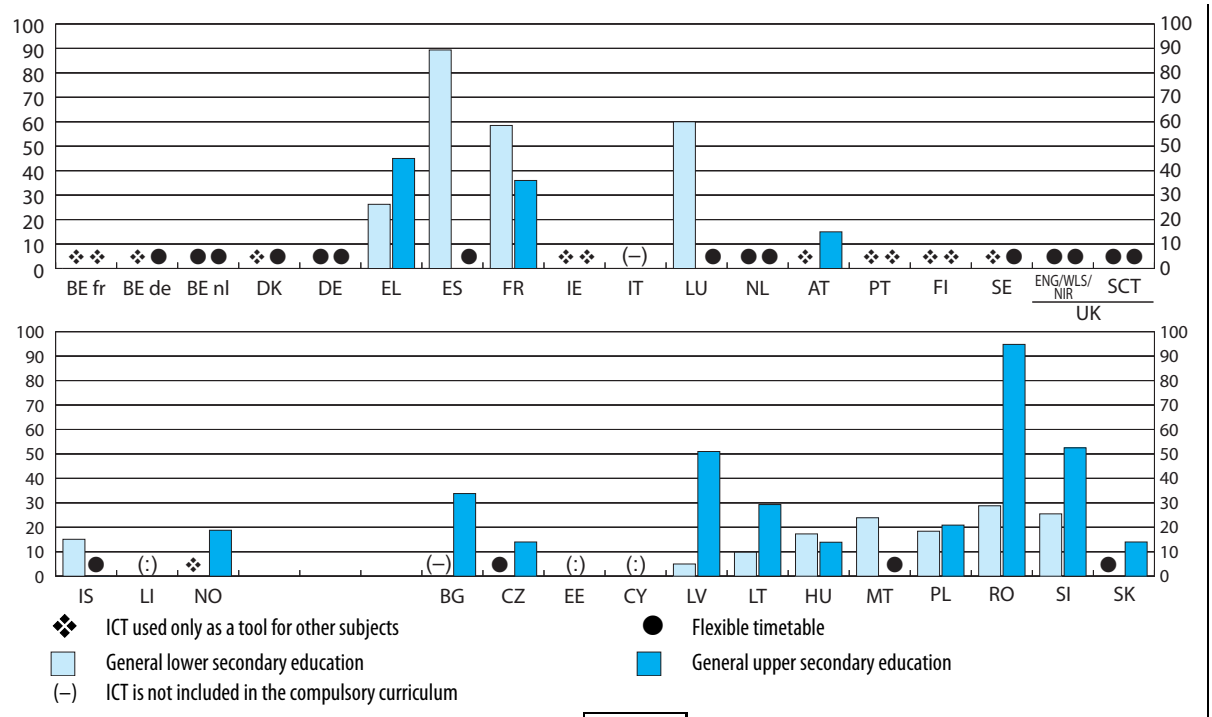
Explanatory note

The development of programming skills may include understanding the logic on which computers are based, and/or the acquisition of basic skills needed to write simple computer programmes.

TIME DEVOTED TO ICT IS FLEXIBLE IN MANY CASES

Comparisons between the time devoted to ICT may only be established where ICT is included as a separate subject in the minimum curriculum and there are official recommendations regarding the time to be allocated to it. As the duration of lower and upper secondary education is not always the same, the number of years during which ICT is offered as a separate subject, and the number of class periods recommended influence the time devoted to ICT as a separate subject. Because these factors vary from one country to another, the time to be devoted has been calculated on the basis of a 'notional' year.

Figure B7: Recommended annual minimum allocation of hours for teaching ICT as a subject in its own right. General lower and upper secondary education (ISCED 2 and 3), 2002/03



	BE fr	BE de	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG/WLS/NIR	UK SC	IS	LI	NO	BG	CZ	EE	CY	LV	LT	HU	MT	PL	RO	SI	SK
General lower secondary education	❖	❖	●	❖	●	26	89	59	❖	(–)	60	●	❖	❖	❖	❖	●	●	15	(:)	❖	(–)	●	(:)	(:)	5	10	17	24	18	29	26	●
General upper secondary education	❖	●	●	●	●	45	●	36	❖	(–)	●	●	15	❖	❖	●	●	●	●	(:)	19	34	14	(:)	(:)	51	29	14	●	21	95	53	14

Source: Eurydice.

Additional notes

Belgium (BE de): At lower secondary level (the first two years), the curriculum includes 6 to 8 periods to be used for projects. In general, ICT has an important role to play within this framework, but rarely as a separate subject.
Spain: The data included in this column for lower secondary education refers to the total number of hours corresponding to the minimum core curriculum. In some secondary schools, there are optional subjects on ICT. In the type of baccalaureate known as 'Technology', which includes 6 subjects related to this topic, the total number of hours corresponding to the core curriculum is 1 155. 420 of these hours are distributed among those six subjects (70 hours per subject per year).

Additional notes (continued)

France: In upper secondary education, ICT is a core curriculum option.
Finland: The curricula are designed at the local level based on the national core curriculum. However, ICT is widely offered as an optional subject and in some schools it may be compulsory **.**
Sweden: Because of the way upper secondary education is organised, there is no stipulated number of teaching hours per week/year in different subjects. Instead, the course volume is based on credits. At upper secondary level it comprises 2 500 credits. Most programs are divided into different specialisations. The Natural Science programme has a mathematics and computer science specialisation, in which computer science courses encompass 200 credit points (= 8 % of the total number of credit points). The guaranteed number of instruction hours for the Natural Science Programme is 2 180 hours, divided over 3 years.
United Kingdom (ENG/WLS/NIR): There are no prescribed time allocations in compulsory education and no compulsory subjects in post-compulsory education. The only recommendations for time to be allocated to ICT relate to 11- to 14-year-olds in England, where the Key Stage 3 National Strategy suggests a programme of study based on a time allocation of one hour per week.
United Kingdom (SCT): Schools and education authorities are free to interpret and adapt the guidelines to suit the particular circumstances of their school and community. Therefore, schools have different allocated teaching periods and different timetables for teaching ICT. National Guidelines do not suggest a minimum teaching time for ICT, but suggests that due to its increasing importance in today's modern world that it permeates all areas in the curriculum for 5-14 year olds.
Czech Republic: The data shown is valid for 4-year *gymnázium*. The subject is compulsory in the first year only, it can be included in the curriculum in the subsequent years at the discretion of the school head.
Hungary: The Curriculum has been under constant change since 1996, with several modifications in content and its compulsory nature.
Slovenia: In lower secondary education, ICT is offered as a core curriculum option.

Explanatory note

Figure B7 shows the minimum number of hours devoted to teaching ICT as a subject in its own right in lower and/or upper secondary education. In order to enable ready comparison between countries, the number of hours is based on a notional year of lower and/or upper secondary education. To do this we have related the number of compulsory hours to the number of years corresponding to ISCED 2 and ISCED 3 respectively.

The calculation thus takes account of the following:

- the number of periods devoted to teaching ICT as a subject in its own right, which are recommended in the curriculum or official guidelines;
- the length of a period (in minutes);
- the number of school days in a week and/or a year (depending on whether the number of periods relates to the amount of teaching in a week or a year);
- the number of years corresponding to the duration of lower and/or upper secondary education.

Number of years in which ICT is taught as a separate subject and number of years corresponding to the duration of **lower secondary education**

														UK	
BE	**DK**	**DE**	**EL**	**ES**	**FR**	**IE**	**IT**	**LU**	**NL**	**AT**	**PT**	**FI**	**SE**	**ENG/WLS/NIR**	**SCT**
			3/3	4/4	4/4			3/3							
IS	**LI**	**NO**		**BG**	**CZ**	**EE**	**CY**	**LV**	**LT**	**HU**	**MT**	**PL**	**RO**	**SI**	**SK**
1/3								1/5	2/6	¾	5/5	2/3	5/5	3/3	

Number of years in which ICT is taught as a separate subject and number of years corresponding to the duration of **upper secondary education**

														UK	
BE	**DK**	**DE**	**EL**	**ES**	**FR**	**IE**	**IT**	**LU**	**NL**	**AT**	**PT**	**FI**	**SE**	**ENG/WLS/NIR**	**SCT**
			3/3		1/3					1/4					
IS	**LI**	**NO**		**BG**	**CZ**	**EE**	**CY**	**LV**	**LT**	**HU**	**MT**	**PL**	**RO**	**SI**	**SK**
1/3		1/3		2/4	1/4			3/3	2/2	4/4		2/4	4/4	4/4	1/4

At primary level, ICT is taught in seven countries only as a separate subject in its own right and in only three of them, Iceland, Poland and Romania, recommendations are issued concerning the amount of teaching time devoted to the subject of ICT (the average annual period is 45 hours in Iceland, 9 in Poland and 29 in Romania).

As far as secondary education is concerned, many countries have a flexible timetable. This is particularly true for countries which were already EU members in 2002/03. Almost all Eastern European countries have issued recommendations on the time devoted to ICT. Where a calculation is possible, the average annual period varies enormously: at lower secondary level it is greatest in Spain (89 hours). In France and Luxembourg, it comes to over 50 hours, whereas in Iceland, Latvia, Lithuania, Hungary and Poland, the average

recommended annual number of hours is less than 20. It should be noted that in Latvia and Lithuania lower secondary education lasts five and six years respectively, but ICT is only taught as a separate subject for one and two years respectively.

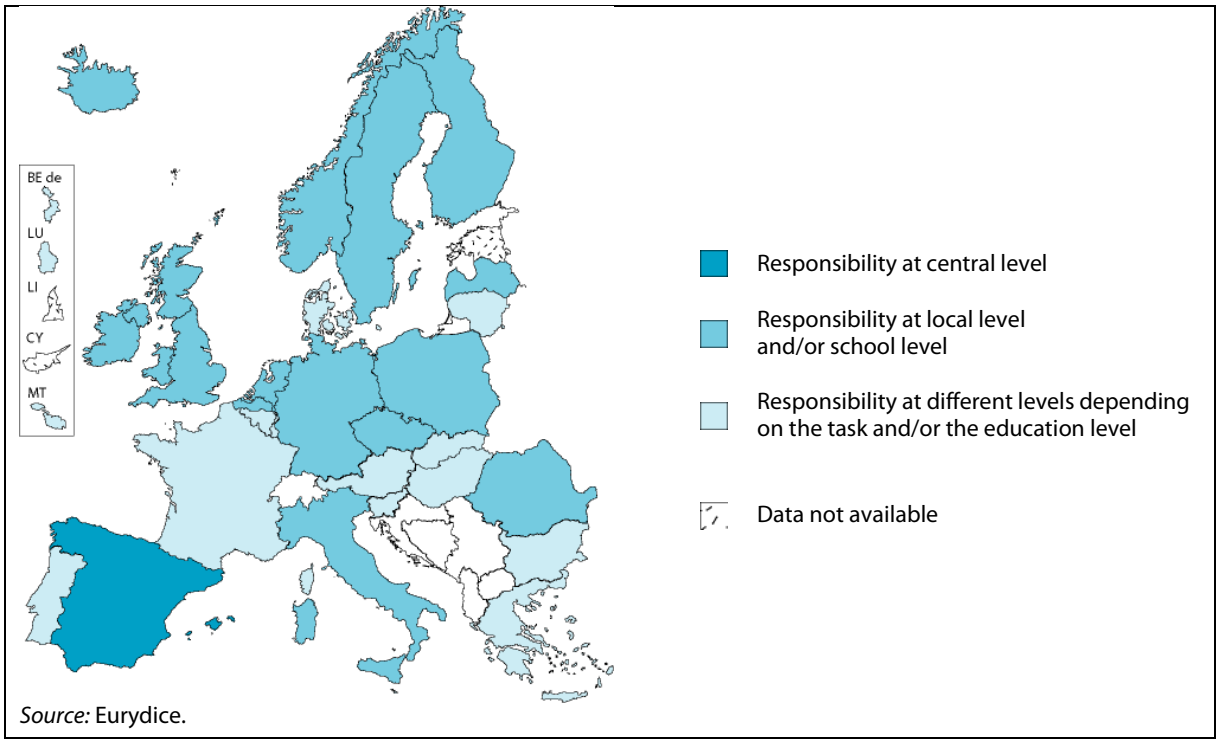
At upper secondary level, this variation continues. However, the average recommended annual number of hours is quite often over 40 and is particularly high in Romania (95 hours) and over 50 hours in Latvia and Slovenia.

In most countries, extra time may be granted to ICT over and above the minimum number of compulsory hours given in Figure B7, within the flexible part of the curriculum which schools are free to determine as they wish. Where schools are entirely free to determine the total number of hours earmarked for ICT, no estimate has been possible.

PURCHASE AND MAINTENANCE OF EQUIPMENT GENERALLY ASSUMED AT LOCAL LEVEL

The central authorities are rarely solely responsible for the purchase and maintenance of hardware (except in Spain (Autonomous Communities), Malta for primary and lower secondary education and in Luxembourg, in the case of secondary education). In most European countries, these responsibilities are either assumed solely at the local level and/or by the school, or they are shared by different authorities, depending on the level of education (Austria and Portugal) or type of expenditure concerned (purchase of hardware or software, or equipment maintenance). The latter situation is the one most frequently encountered.

Figure B8: Level of responsibility for the purchase and maintenance of equipment. Primary and secondary education (ISCED 1, 2 and 3), 2002/03



Source: Eurydice.

Additional notes

Belgium (BE fr, BE de): Within the framework of its long-term economic policy, significant means have been invested centrally from 1999 onwards by the Walloon Region and the Region of Brussels in order to equip all schools in the French Community. Decisions to purchase supplementary equipment are taken freely by the schools. The situation was similar in the German-speaking Community between 1999 and 2001.
Belgium (BE nl): The ministry defines a general framework and provides subsidies for both purchase and maintenance. The schools decide autonomously which infrastructure is bought according to their own particular needs.
Spain: The Autonomous Communities are responsible for supplying hardware and software to schools and the maintenance of their facilities. In addition, the municipalities may also launch their own initiatives and programmes to contribute to the purchase and maintenance of equipment. In 2002, the Central Government launched a programme through the Ministries of Education, Culture and Sport, and Science and Technology to offer strong support to the actions of the Autonomous Communities.
Austria: In primary education, responsibility for purchasing and maintenance is assumed at the local level of authority; in secondary education, the responsibility depends on the school type.
United Kingdom: Schools have overall responsibility for their own budgets. In England and Wales, schools and local authorities are supported by government grants for expenditure on ICT infrastructure, services, and content. In Northern Ireland, all schools receive a core-managed service at no additional cost to their budgets.
Iceland: At upper secondary level, the responsibility for equipment lies at central level.
Hungary: Some equipment purchases are initiated by national programmes, some by local or regional entities, or the maintainer itself. Depending on the school, it is possible that equipment is being maintained by the local government (school maintainer).

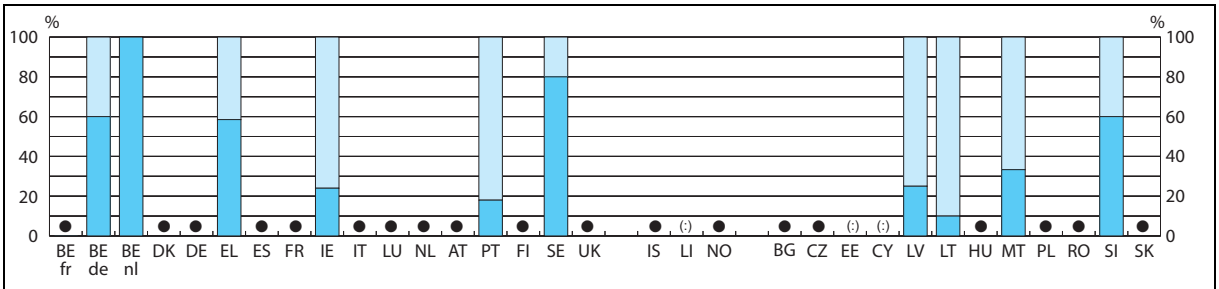
Explanatory note

The central level or top level of education authority is represented by the national ministries of education, except in Belgium (ministries of the three Communities), in Germany (federal government and ministries of the 16 *Länder*) and in Spain (national ministry and governments of Autonomous Communities).

GREATER EMPHASIS ON EXPENDITURE ON HUMAN RESOURCES NOW IN SOME COUNTRIES

In many countries, responsibility for the purchase and maintenance of equipment is decentralised and a different player often manages expenditure for human resources. It is therefore rarely possible to ascertain the distribution between the two headings.

Figure B9: Distribution of the specific budget between the purchase of equipment and expenditure on human resources. Primary and secondary education (ISCED 1, 2 and 3), 2002/03



	BE fr	BE de	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK	IS	LI	NO	BG	CZ	EE	CY	LV	LT	HU	MT	PL	RO	SI	SK
Human resources	●	60	100	●	●	58.5	●	●	24	●	●	●	●	18	●	80	●	●	(:)	●	●	●	(:)	(:)	25	10	●	33.3	●	●	60	●
Equipment		40	0			41.5			76					82		20									75	90		66.7			40	

Source: Eurydice.

Additional notes

Greece: The proportion shown relates to the primary level.
Latvia: The expenditure plan is approved by Latvian Education Computerisation System Surveillance Board. The proportion indicated is an estimate.
Lithuania: The whole budget is primarily devoted to ICT in the last two years of lower secondary and upper secondary level.

In the few countries in which it is possible to ascertain how the budget is distributed, it can be seen that expenditure on human resources accounts for the larger share in five of them. In Belgium (Flemish Community), the whole budget is currently earmarked for human resources, mainly for continuous professional development, and expenditure on ICT coordinators at school level. In Ireland, Portugal, Latvia, Lithuania, and Malta, the greatest shares of the budgets are earmarked for equipment and facilities (ranging from 67 % in Malta to 90 % in Lithuania). In Greece, the budget is divided into two roughly equal shares devoted to human resources and equipment at secondary level respectively.

Compared with the situation in 2000, human resources now occupy a more prominent position in the budget of Belgium (German-speaking Community), Sweden, and Slovenia, where the budget was clearly balanced in favour of equipment. In these countries, heavy investment in equipment has now been replaced by investment in teacher education.

EQUIPMENT

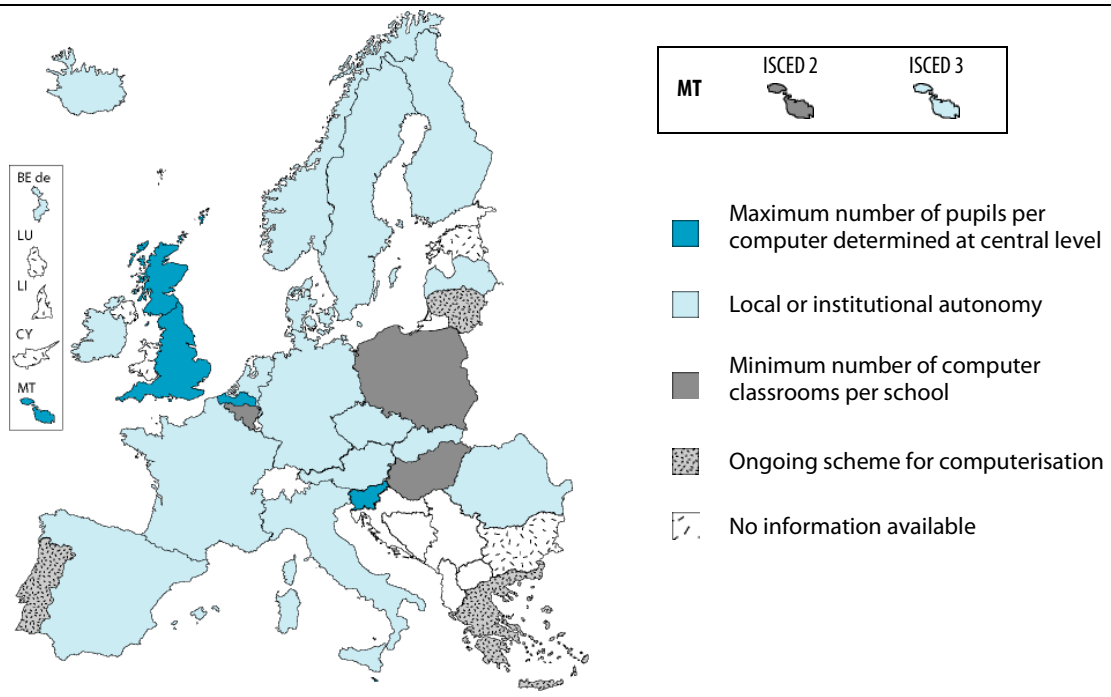
MOST COUNTRIES HAVE NO CENTRAL REGULATIONS FIXING A MAXIMUM NUMBER OF PUPILS PER COMPUTER

In the majority of countries, decisions pertaining to investments in computer facilities are taken at local level. There are no central recommendations specifying a number of pupils per computer or a number of computers per school. Schools or local authorities decide on their own investment scheme based on their priorities and specific needs.

Some countries or regions (Belgium (Flemish Community), the United kingdom (England and Scotland), Malta and Slovenia) have central recommendations that specify a ratio for the number of pupils per computer. In the United Kingdom, this ratio varies with the level of education. In Malta, such ratios have been established for primary education only. On the other hand, in Hungary and Poland, it is specified that there should be at least one computer classroom in each school, irrespective of the number of pupils enrolled.

It is noteworthy that the situation is changing. Greece, Portugal and Lithuania have established official objectives for reducing the number of pupils per computer. Portugal and Lithuania plan to attain the ratio of ten pupils per computer between 2004 and 2006. Greece has fixed specific ratios by level of education (34 pupils per computer at primary level, 9 at lower secondary level and 13 at upper secondary level) to be reached by 2006.

**Figure C1: Types of official recommendations regarding the rate of computerisation, depending on the number of pupils or institution.
Primary and secondary education (ISCED 1, 2 and 3), 2002/03**



Source: Eurydice.

Countries specifying a maximum number of pupils per computer

	BE nl	UK-ENG	UK-SCT	MT	SI
ISCED 1	1:10	1:11	1:7.5	1:7	1:5
ISCED 2 and 3		1:7	1: 5	(–)	

Additional notes

Belgium (BE fr): Official recommendations establish a minimum number of computer classrooms based on the number of pupils.
Greece: Since the year 2000, the number of pupils per computer has fallen from 1 091 to 35 at primary level.
United Kingdom (ENG): Government funding for ICT infrastructure and services is allocated to LEAs according to a formula based on both school and pupils numbers. LEAs must devolve the bulk of this funding to schools, targeting schools which have not reached baseline access (as shown above) and supporting provision beyond this towards the published targets. Schools may also, of course, decide to spend part of their own general school budget on ICT if they so wish.
Hungary: There has to be one computer for every two pupils in the class using the computer room.
Malta: At lower secondary level (ISCED 2), official recommendations decisions relate to the number of computer classrooms based on the number of pupils.
Poland: A minimum of 10 networked computers per school for the primary and lower secondary levels. A minimum of 16 networked computers and 4 computers in the school library at upper secondary level.
Slovenia: The ratio for the number of pupils per computer is supplemented with a minimum of one additional computer in each class.

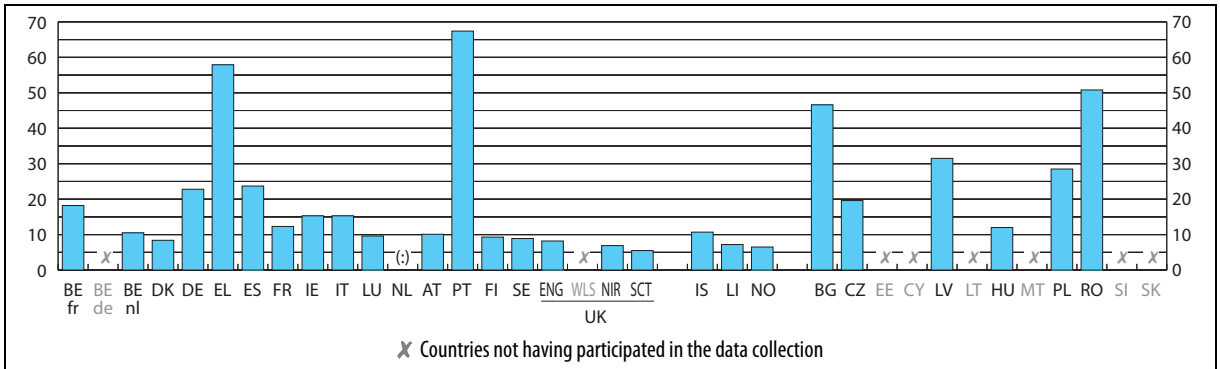
TWENTY PUPILS OR LESS PER COMPUTER, THE MOST CURRENT SITUATION AT THE END OF COMPULSORY EDUCATION

In many European countries in the year 2000, pupils aged 15 attended a school that on average had at least one computer for 20 pupils. Seven countries (Denmark, Luxembourg, Finland, Sweden, the United Kingdom, Liechtenstein and Norway) are characterised by a ratio even lower than 10. On the other hand, in Bulgaria and Latvia, there are at least 30 pupils per computer and in three countries (Greece, Portugal and Romania), over 50.

This situation should however change quickly. Indeed, as the official recommendations concerning investment in computers in primary and secondary education indicate (Figure C1), national objectives aimed at reducing the number of pupils per computer have been established, in Greece, Portugal and Lithuania. It should also be borne in mind that the rate of computerisation in schools reveals nothing about the use made of computers (see Chapter E for further information), or their quality.

The comparison between Figures C1 and C2 clearly indicates that in countries or regions (Belgium (Flemish Community) and the United Kingdom (England and Scotland)) in which the central authorities have established a 'number of pupils per computer' ratio, the average number of pupils per computer observed within institutions is very close to the recommended standard.

Figure C2: Average number of pupils per computer in schools attended by pupils aged 15, 1999/2000



BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
18.2	10.5	8.4	22.8	57.9	23.7	12.3	15.3	15.3	9.6	(:)	10.1	67.4	9.3	8.9	8.2	6.9	5.5	10.7	7.2	6.5	46.6	19.6	31.5	12.0	28.5	50.8

Source: OECD, PISA 2000 database.

Additional note

Netherlands: The response rate to the PISA 2000 survey was considered to be too low for purposes of meaningful comparison. This is why the data (number of pupils per computer = 10.6) are not shown in the Figure. See the glossary for further details.

Explanatory note

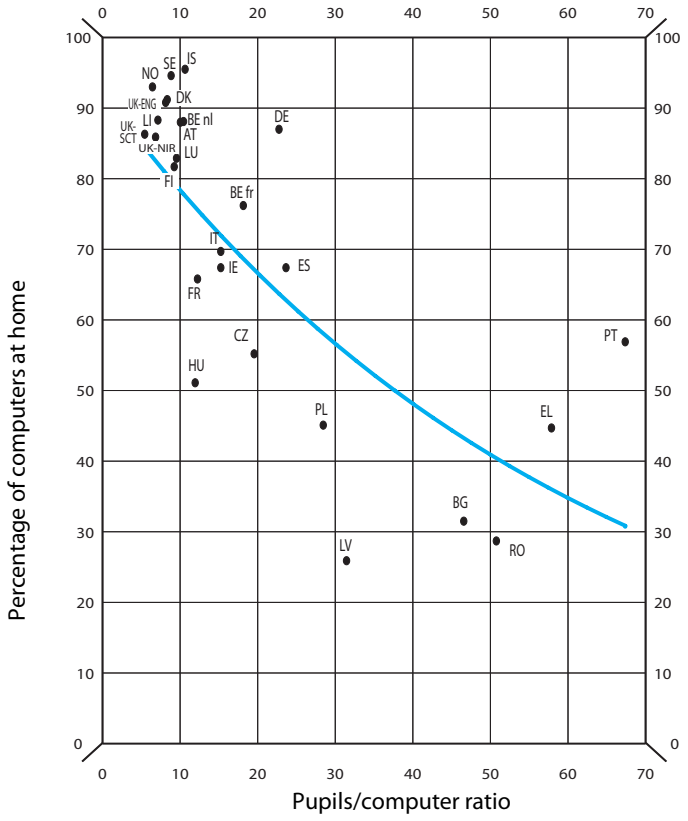
The Figure relates to all computers available in the school, including those intended for teaching and administrative staff.

THE LEVEL OF COMPUTERISATION IN SCHOOLS OFTEN MIRRORS THAT IN THE HOME

The development of computer facilities in schools reflects the corresponding domestic trend (Figure A3). Countries with the highest percentages of home computers are those in which pupil/computer ratios at school are lowest. Five countries (Germany, Greece, Portugal, Bulgaria and Romania) are exceptions to this general trend. In Germany, domestic computerisation is very widespread, but computer facilities in schools are less well developed. Similarly, in Greece and Portugal, the rate of school computerisation is particularly weak compared to home computer penetration.

Moreover, the correlation coefficient between the number of pupils per computer and per capita GDP shows a relationship between both variables (see Annex 3). Therefore, the higher the per capita GDP, the more the computer environment is developed, both in families and at school. This relationship confirms the situation highlighted in Figure A1.

Figure C3: Relationship between the average number of 15-year-old pupils per school computer and the percentage of 15-year-old pupils who claim that they have a computer at home, 1999/2000



	X	Y		X	Y
BE fr	18.2	76.2	**IS**	10.7	95.5
BE nl	10.5	88.1	**LI**	7.2	88.3
DK	8.4	91.2	**NO**	6.5	93.0
DE	22.8	87.0			
EL	57.9	44.7	**BG**	46.6	31.5
ES	23.7	67.4	**CZ**	19.6	55.2
FR	12.3	65.8	**LV**	31.5	25.9
IE	15.3	67.4	**HU**	12.0	51.1
IT	15.3	69.7	**PL**	28.5	45.1
LU	9.6	82.9	**RO**	50.8	28.7
NL	(:)	(:)			
AT	10.1	88.0			
PT	67.4	56.9			
FI	9.3	81.7			
SE	8.9	94.6			
UK-ENG	8.2	90.8			
UK-NIR	6.9	85.9			
UK-SCT	5.5	86.3			

Source: OECD, PISA 2000 database.

Additional note

Netherlands: The response rate to the PISA 2000 survey was considered to be too low for purposes of meaningful comparison. This is why the data (x = 10.6; y = 95.4) are not shown in the Figure. See the glossary for further details.

SCHOOL COMPUTERISATION OCCURS GRADUALLY

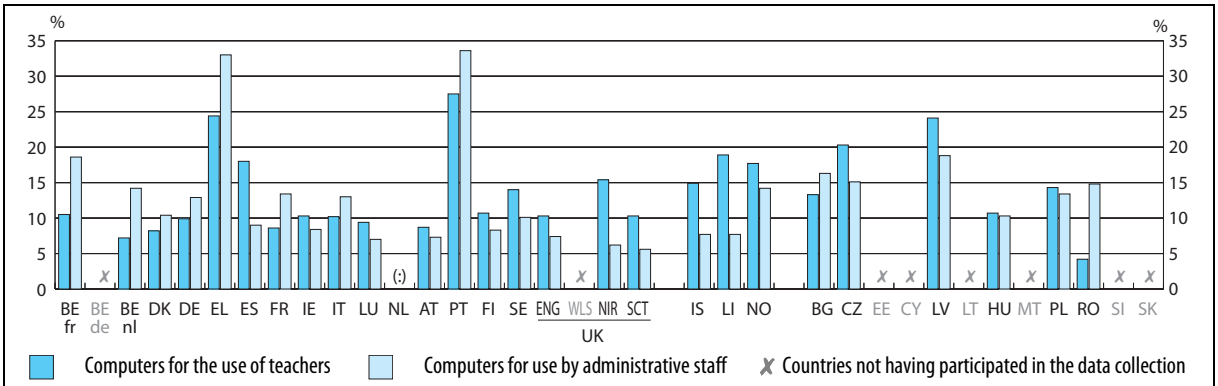
In the year 2000, there was still a marked disparity in the development and level of computerisation in schools attended by 15-year-old pupils, in Europe. These figures seem to indicate that, in some countries, computerisation can still not be regarded as fully complete.

The percentages of computers reserved exclusively for teachers varies between countries from 4.2 % to 27.5 %. The lowest rates are in Belgium (Flemish Community), Denmark, France, Austria and Romania. The highest rates are recorded in Greece, Portugal, and Latvia. The percentages of computers for use by administrative staff also vary from one country to the next (from 5.6 % to 33.6 %). Five countries (Luxembourg, Austria, the United Kingdom (England, Northern Ireland and Scotland), Iceland, and Liechtenstein) have the lowest rates while Greece and Portugal have the highest.

Generally, countries with a small percentage of computers allocated for use by teachers also have a small percentage of computers for administrative use. If these results are compared with the pupils/computer ratio within the school (Figure C2), it can be seen that certain countries with a high ratio report a particularly high percentage of computers allocated for the exclusive use of teachers or administrative tasks.

These observations seem to suggest that school computerisation occurs in two phases. The first phase corresponds to the computerisation of school administration, whereas the aim of the second phase is to equip classes or to develop computer classes exclusively earmarked for educational purposes.

Figure C4: Average percentage of computers exclusively reserved for the use of teachers and administrative staff in schools attended by pupils aged 15, 1999/2000



	BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
	10.5	7.2	8.2	9.9	24.4	18.0	8.6	10.3	10.2	9.4	(:)	8.7	27.5	10.7	14.0	10.3	15.4	10.3	14.9	18.9	17.7	13.3	20.3	24.1	10.7	14.3	4.2
	18.6	14.2	10.4	12.9	33.0	9.0	13.4	8.4	13.0	7.0	(:)	7.3	33.6	8.3	10.1	7.4	6.2	5.6	7.7	7.7	14.2	16.3	15.1	18.8	10.3	13.4	14.8

Source: OECD, PISA 2000 database.

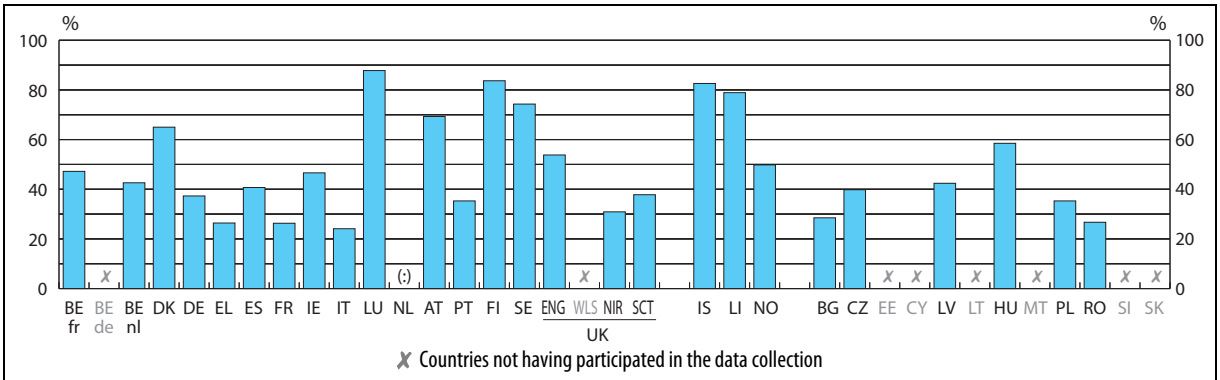
Additional note

Netherlands: The response rate to the PISA 2000 survey was considered to be too low for purposes of meaningful comparison. This is why the data (computers for the use of teachers = 12.3; computers for use by administrative staff = 10.2) are not shown in the Figure. See the glossary for further details.

THE GREATER THE LEVEL OF COMPUTERISATION, THE GREATER THE NUMBER OF SCHOOL INTERNET CONNECTIONS

The percentages of computers connected to the Internet vary considerably among countries (they may be over three times as high in some cases as in others). Those countries in which the schools have a greater number of computers also show high rates of computers connected to the Internet (Luxembourg, Finland, Sweden, Iceland and Liechtenstein).

Figure C5: Average percentage of computers connected to the Internet in schools attended by pupils aged 15, 1999/2000



BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
47.2	42.6	65	37.3	26.4	40.7	26.3	46.6	24.1	87.8	(:)	69.3	35.3	83.7	74.3	53.8	30.9	37.8	82.6	78.9	49.8	28.5	39.8	42.4	58.5	35.3	26.7

Source: OECD, PISA 2000 database.

Additional note

Netherlands: The response rate to the PISA 2000 survey was considered to be too low for purposes of meaningful comparison. This is why the data (average percentage of computers connected to the Internet = 45.1) are not shown in the Figure. See the glossary for further details.

Explanatory note

The Figure relates to all computers available in the school which are connected to the Internet, including those intended for teaching and administrative staff.

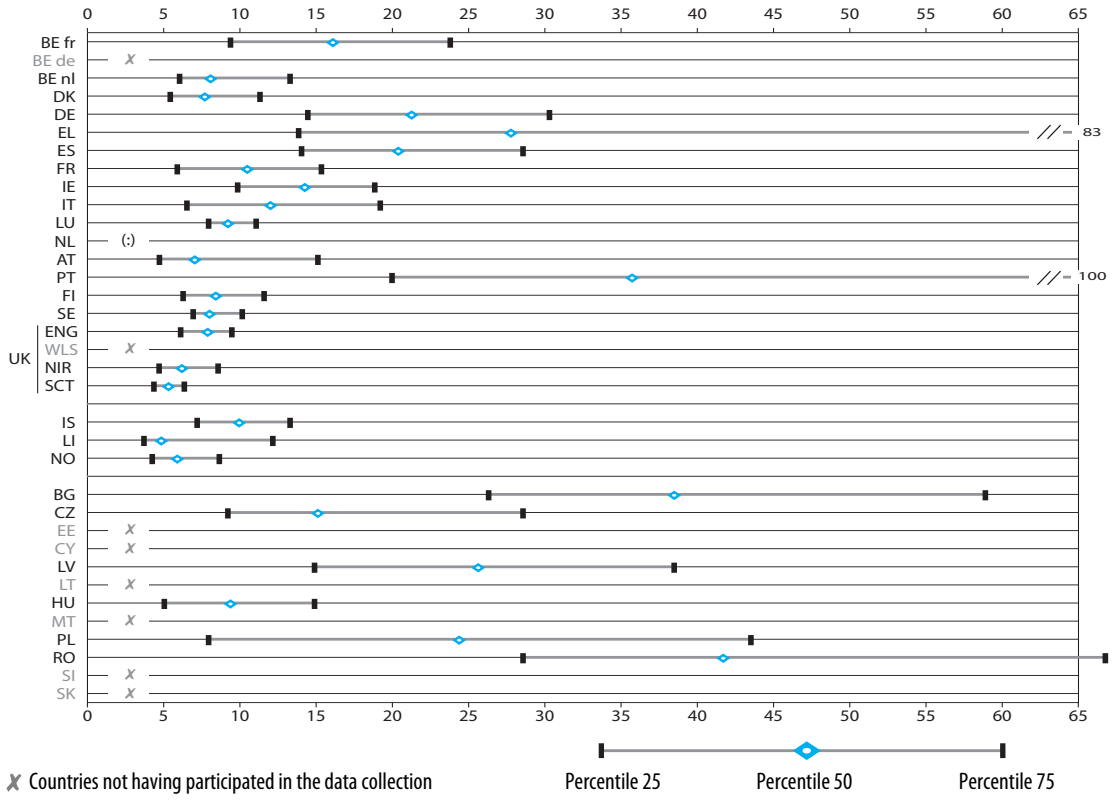
MARKED DISPARITIES IN THE LEVEL OF COMPUTERISATION OF SCHOOLS WITHIN SOME COUNTRIES

Beyond the macro-economic factors that may explain the penetration of computers in schools and families, it is advisable to evaluate the significance of variations between schools within each country in order to establish whether these variations are linked to structural variables (see Figures C7 and C8).

Figure C6 clearly indicates that in some countries there are significant disparities between schools. Greece, Portugal, Bulgaria and Romania are characterised by very wide distributions of the pupil/computer ratios with, in certain schools, less than 25 pupils for a computer and, in others, more than 90. Wide distributions are also observed, but to a lesser extent, in the Czech Republic, Latvia, and Poland. Conversely, the Scandinavian countries and, above all, the United Kingdom (England, Northern Ireland and Scotland) are noteworthy for highly concentrated distributions, which reflect a genuinely uniform school computer environment.

These observations may be compared with the overall level of computerisation. The lower the average pupils/computer ratio – indicative of a significant measure of computerisation (see Figure C2) – the more the distribution of the school ratios is concentrated. The higher the average pupils/computer ratio, the broader is the distribution, with some schools well equipped and others clearly less so.

Figure C6: Distribution of the pupil/computer ratios between schools attended by pupils aged 15, 1999/2000



(P)	BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
10	7.5	4.4	3.6	10.1	8.9	8.6	3.7	7.3	5.4	6.5	(:)	3.6	11.9	4.7	5.1	4.9	3.5	3.5	4.9	3.1	2.5	17.5	6.5	1.3	3.1	4.7	22.7
25	9.4	6.1	5.5	14.5	13.9	14.1	6.0	9.9	6.6	8.0	(:)	4.8	20.0	6.3	7.0	6.2	4.8	4.4	7.3	3.8	4.3	26.3	9.3	14.9	5.1	8.0	28.6
50	16.1	8.1	7.8	21.3	27.8	20.4	10.5	14.3	12.1	9.3	(:)	7.1	35.7	8.5	8.1	7.9	6.3	5.4	10.0	4.9	6.0	38.5	15.2	25.6	9.4	24.4	41.7
75	23.8	13.3	11.4	30.3	83.3	28.6	15.4	18.9	19.2	11.1	(:)	15.2	100.0	11.6	10.2	9.5	8.6	6.4	13.3	12.2	8.7	58.8	28.6	38.5	14.9	43.5	66.7
90	34.5	20.0	13.7	38.5	142.9	41.7	23.3	25.6	29.4	12.2	(:)	19.6	166.7	14.1	13.7	11.8	10.8	7.7	16.7	13.5	11.2	90.9	34.5	66.7	22.2	55.6	90.9

(P): Percentile

Source: OECD, PISA 2000 database.

Additional note

Netherlands: The response rate to the PISA 2000 survey was considered to be too low for purposes of meaningful comparison. This is why the data (percentile 10 = 4.22; percentile 25 = 6.29; percentile 50 = 10.1; percentile 75 = 13.89; percentile 90 = 16.95) are not shown in the Figure. See the glossary for further details.

Explanatory note

The definition of a percentile is given in the statistical tool glossary.

In the interests of clarity, the figure only shows the ratios corresponding to percentiles 25, 50, and 75 of the distribution. This choice is justified insofar as the integration of the values to percentiles 10 and 90 (presented in the table under the figure) only slightly modifies the profile of distribution.

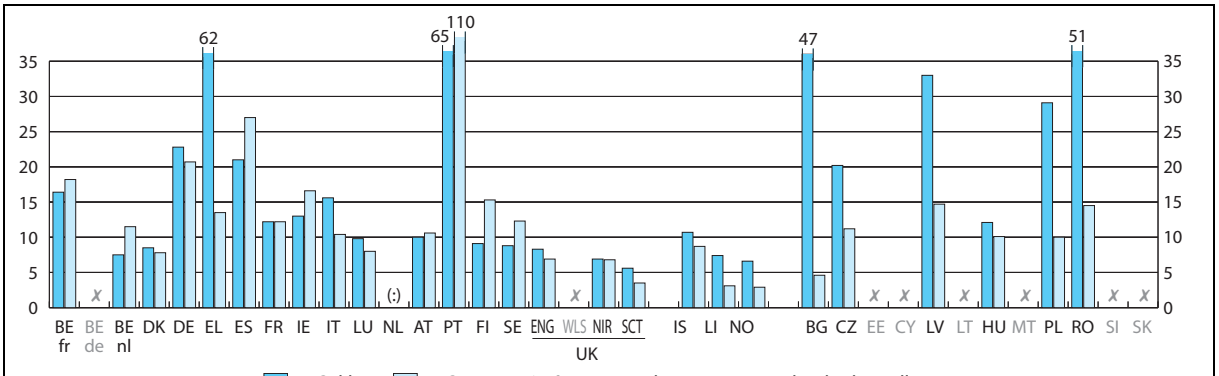
It is also noticeable that in those countries where central regulations concerning investments in information technologies (see Figure C1) require fixed ratios (the number of pupils per computer), variations are small. This is clearly the case in the United Kingdom (England and Scotland). In Hungary and Poland, the set minimum is one computer class by school, regardless of the size of the school. However, in Poland, the size of the schools varies considerably more than in Hungary. This difference partly explains a wider distribution of the pupil/computer ratio than in Hungary.

COMPUTERISATION IN MODESTLY SUBSIDISED PRIVATE SCHOOLS IS MORE FAVOURABLY DEVELOPED

Figure C7 illustrates the scale of the disparities between public-sector and private schools in terms of computer facilities. In 12 countries or regions, there is a significant difference between private and public schools. In Greece, Bulgaria, and to a lesser extent Latvia and Poland, the difference between public and private is particularly high. In most of the countries mentioned above, private schools feature a better computer environment. In general, such schools are primarily financed by private sources, mainly by families. It should be noted that the most significant differences to the benefit of the private schools (partially or not subsidised) are observed primarily within the countries that are characterised by a lower gross domestic product (see Figure A1). As public-sector schools are less computerised, this relation seems to indicate that the wealthiest families capable of investing financially in the schooling of their children, choose to enrol them in private schools. However, these data should be seen in perspective since, as Figure C7 indicates, the proportion of private schools in these countries is very low.

Only Belgium (Flemish Community), Spain, and Ireland display a significant difference in favour of public-sector schools. In these countries, financing of private schools is subsidised to a level similar to that of public-sector schools and access is free.

Figure C7: Average number of pupils per computer in private schools and public-sector schools attended by pupils aged 15, 1999/2000



	BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
Public	16.4	7.5	8.5	22.8	61.6	21	12.2	13	15.6	9.8	(:)	10	64.8	9.1	8.8	8.3	6.9	5.6	10.7	7.4	6.6	46.9	20.2	33	12.1	29.1	51.4
Private	18.2	11.5	7.8	20.7	13.5	27	12.2	16.6	10.4	8	(:)	10.6	110	15.3	12.3	6.9	6.8	3.5	8.7	3.1	2.9	4.6	11.2	14.7	10.1	10	14.5

Source: OECD, PISA 2000 database.

Proportion of private schools whether grant aided or not

BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
71.4	75.7	24.7	4.4	7.2	39.3	21.6	60.9	5.8	12.1	(:)	12.7	7.3	2.8	3.4	9.4	0.9	3.6	0.8	4.3	1.4	0.6	6.0	0.7	5.3	2.9	0.9

Source: Eurostat, UOE 1999.

Additional note

Netherlands: The response rate to the PISA 2000 survey was considered to be too low for purposes of meaningful comparison. This is why the data (public-sector = 8.7; private = 11) are not shown in the Figure. See the glossary for further details.

Explanatory note (Figure C7)

Public-sector schools are directly or indirectly administered by a public education authority. Private schools are directly or indirectly administered by a non-governmental organisation (church, trade union, a private business concern or other body).

The difference between the level of computerisation in public-sector and private schools is significant in Belgium (Flemish Community), Greece, Spain, Ireland, Luxembourg, Iceland, Liechtenstein, Norway, Bulgaria, the Czech Republic, Latvia and Poland. The scale of the standard error (see annex 5) associated with the very low proportion of private schools means that the difference observed in other countries is insignificant in statistical terms.

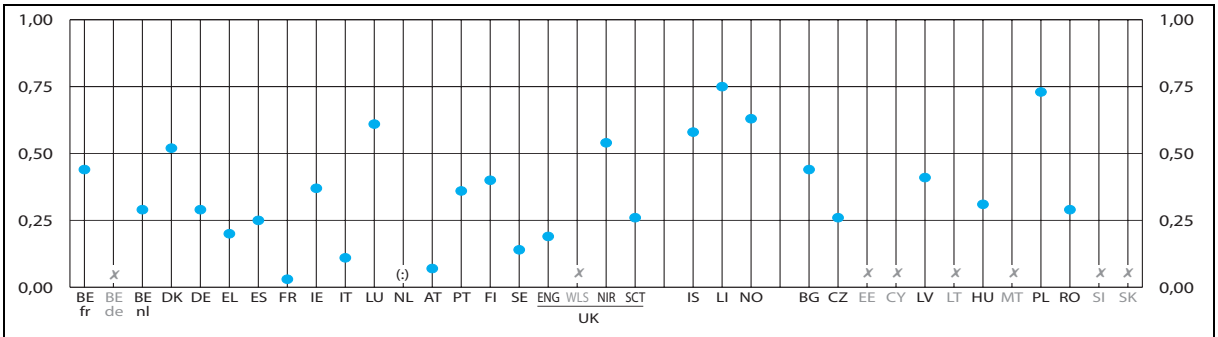
IN SOME COUNTRIES, THERE ARE MORE PUPILS PER COMPUTER IN SMALL SCHOOLS

The size of the school is also one of the factors that can explain the differences observed between schools. If the investment in information technology is proportional to the size of the school, the correlation should approach zero. If this investment is not proportional to the number of pupils, but has a tendency to be constant, independently of the number of pupils, then the correlation should approach 1. In this case, the larger the size of the school, the higher the pupils/computer ratio.

In seven countries (Denmark, Luxembourg, the United Kingdom (Northern Ireland), Iceland, Liechtenstein, Norway and Poland), variations in the computer environment correlate largely to the size of the school. This is particularly significant in two small countries (Luxembourg and Liechtenstein) and in Poland. In other words, the more pupils the school has, the higher the pupils/computer ratio. In those countries, the computer environment is more advantageous in the small schools (which are often rural schools).

Conversely, and with reference to Figure C1, it appears that in those countries or regions that practise fixed investment policies specifying a fixed number of pupils per computer, as in Belgium (Flemish Community) or in the United Kingdom (England and Scotland), computer facilities tend to be proportional to the size of the school. This correlation is very low.

Figure C8: Correlation between the pupils/computer ratio and the size of schools attended by pupils aged 15, 1999/2000



BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
0.44	0.29	0.52	0.29	0.20	0.25	0.03	0.37	0.11	0.61	(:)	0.07	0.36	0.40	0.14	0.19	0.54	0.26	0.58	0.75	0.63	0.44	0.26	0.41	0.31	0.73	0.29

Source: OECD, PISA 2000 database.

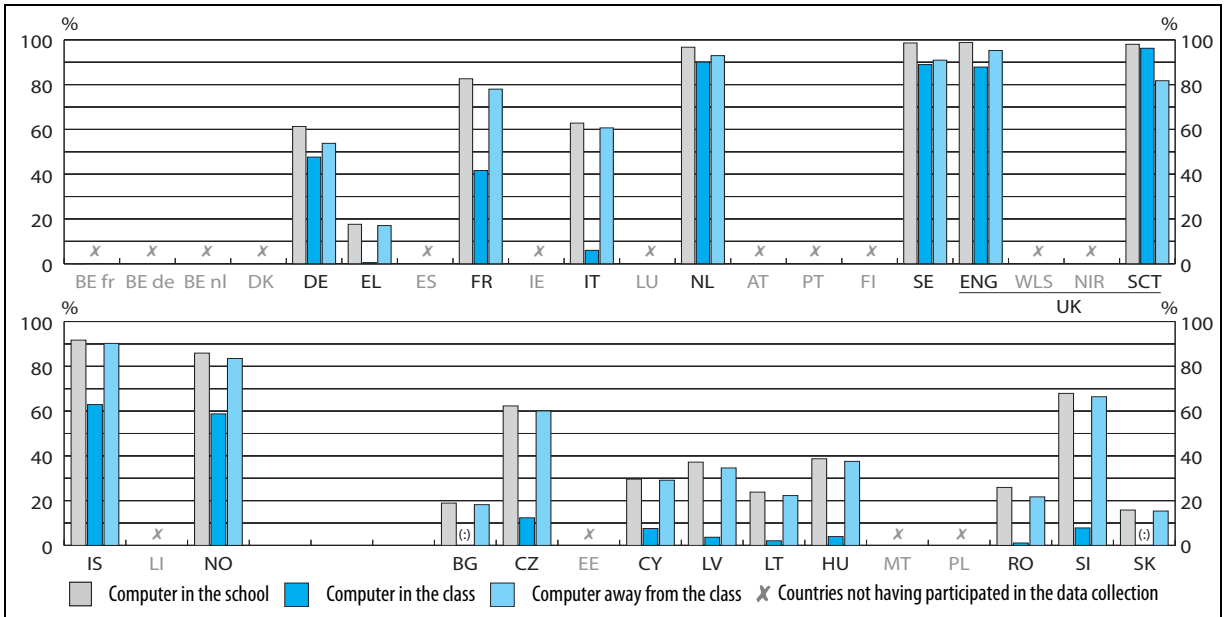
Additional note

Netherlands: The response rate to the PISA 2000 survey was considered to be too low for purposes of meaningful comparison. This is why the data (correlation = 0.3) are not shown in the Figure. See the glossary for further details.

LOCATION OF COMPUTERS AND PUPILS ACCESS AS POINTERS TO THE LEVEL OF SCHOOL COMPUTERISATION

The computerisation of schools in primary education generally presupposes two options which both involve making at least one computer available to an increasingly greater number of pupils. These one or more computers are either located away from the classroom, or within it. Countries in which the level of school computerisation is relatively low generally choose the first option. In the remainder, both options may be possible, with relatively large numbers of pupils able to access the classroom computer and virtually all pupils able to access a computer away from the class. Depending on the level of computerisation, they may do this either in a separate specially equipped room or a multimedia library.

Figure C9: Percentages of pupils who attend a class with access to at least one computer located in or away from the class (grade 4), 2000/01



%	DE	EL	FR	IT	NL	SE	UK ENG	UK SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
	61.3	17.6	82.6	62.8	96.7	98.6	98.8	98.0	91.7	85.9	18.9	62.3	29.6	37.2	23.8	38.7	25.9	67.9	15.8
	47.6	0.5	41.6	6.0	90.0	88.9	87.8	96.2	62.9	58.8	(:)	12.3	7.5	3.6	2.1	3.9	1.1	7.8	(:)
	53.8	17.0	78.0	60.7	92.9	90.9	95.2	81.7	90.2	83.5	18.2	60.1	29.1	34.6	22.3	37.5	21.7	66.4	15.3

Source: IEA, PIRLS 2001 database.

In three countries (the Netherlands, Sweden and the United Kingdom (England and Scotland)), where the teachers surveyed estimate that more than 80 % of the pupils have access to at least one computer in and outside the classroom, computerisation is almost complete.

In four countries (France, Italy, the Czech Republic, and Slovenia), computerisation is relatively well developed in that the estimated percentage of pupils able to access at least one computer away from the classroom is in all cases higher than 60 %.

Finally, in the other countries surveyed (Greece and almost all Eastern European countries), the second option of classroom access to a computer is virtually non-existent. The teachers surveyed estimate that less than 40 % of pupils have access to a computer away from the classroom.

D

TEACHERS

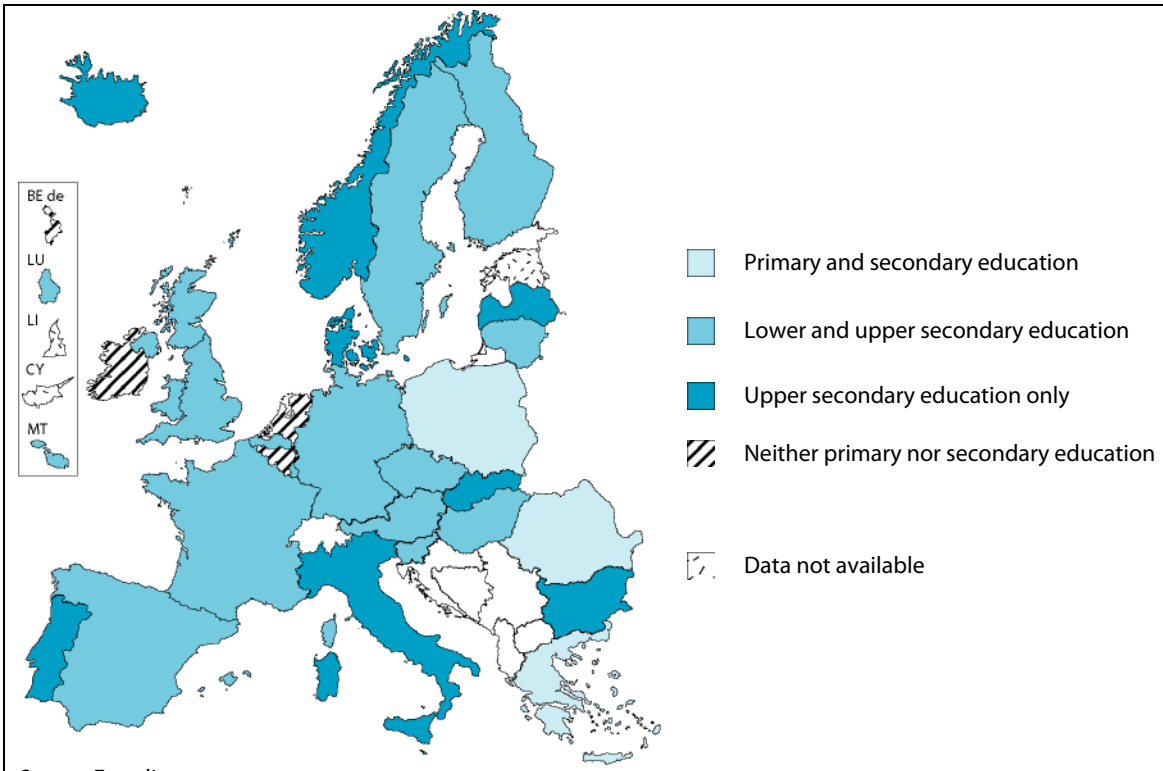
TEACHERS WHO ARE SPECIALISTS IN ICT WORK MAINLY AT SECONDARY LEVEL

Most countries employ specialist teachers for ICT, even in cases where ICT is not a separate subject but used as a tool for other subjects. ICT specialist teachers support the other subject teachers and/or participate in cross-curricular projects.

In almost all countries, these specialist teachers are employed at secondary education level. Only in Greece (in one new type of primary school), Poland, and Romania, specialist teachers in ICT may also be employed at primary level. In eight countries, they are responsible for teaching ICT at upper secondary level only.

Belgium (French and German-speaking Communities), Ireland and the Netherlands do not train specialist teachers in ICT for any level of education.

Figure D1: Specialist ICT teachers.
Primary and secondary education (ISCED 1, 2 and 3), 2002/03



Source: Eurydice.

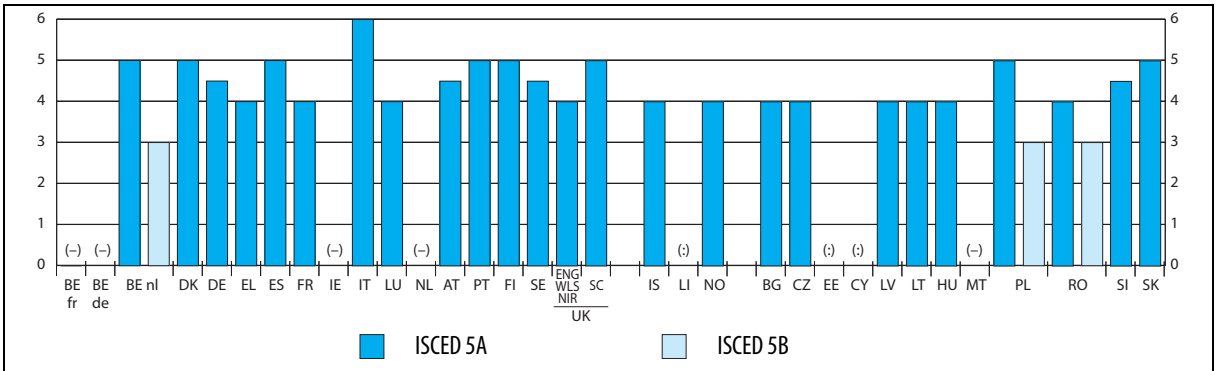
Additional notes

Greece: Specialist ICT teachers work at 'All Day Primary Schools'. This type of school is not compulsory and is for primary school pupils who wish to stay for 3 more hours at school every day. Since October 2002, 2.700 'All Day Primary Schools' have been established.
Malta: Specialist teachers support class teachers at primary level.

Most countries provide an initial education pathway leading to a qualification as an ICT specialist teacher.

In most cases, this initial education is provided at university level and lasts four or five years. Specialists who are intending to teach at primary or lower secondary level are trained in non-university tertiary education in Belgium (Flemish Community), Poland, and Romania. In these cases, education lasts three years.

Figure D2: Minimum length and level of initial teacher education for specialist ICT teachers (ISCED 1, 2 and 3), 2002/03



Source: Eurydice.

Additional notes

Belgium (BE nl): Education at ISCED level 5A is for those intending to work at upper secondary level, education at ISCED level 5B for lower secondary level. ICT teachers may either be teachers with a specialised initial education in informatics or with another initial teacher education and proof of ICT education competence following in-service education. The school is free to decide which teacher to employ.
Germany: Education may last between seven and nine semesters (three-and-a-half and four-and-a-half years) depending on the level of education at which the future teacher intends to teach. The figure shows the length of education for teachers qualifying for the upper secondary level.
Greece, Latvia and **Hungary**: Education may last four or five years.
France: Students who have obtained a university degree and been successful in an open competition are admitted to professional education in the *Institut universitaire de formation des Maîtres* (IUFM).
Austria: The study course shown exists since the academic year 2000/01. It is provided for teachers intending to work in *allgemeinbildende höhere Schulen*. Before then, teachers who already held a teaching qualification in other subjects had to take specialised courses at the so-called *Pädagogischen Instituten* (institutions for in-service education). For teachers intending to work in *Hauptschulen*, ICT may be chosen as an additional subject specialisation.
Bulgaria: Education may also be provided at ISCED level 6.
Poland: Three-year education is for teachers intending to work at primary or lower secondary level, five-year education for teachers intending to work at upper secondary level.
Romania: Education for teachers intending to work at primary and lower secondary level may be provided at ISCED level 5A or 5B and may last three or four years, education for those intending to work at upper secondary level four or five years at ISCED level 5A.

Explanatory note

The table shows the compulsory minimum length of training but does not include the final 'on-the-job' qualifying phase (induction stage).

In addition, in many countries, teachers who are already fully qualified (i.e. staff who have satisfactorily completed teacher education and are qualified to teach the subject(s) in which they provide instruction at a given educational level), may take further teaching qualifications in order to work as a specialist ICT teacher. In Malta, this is the only route to becoming an ICT teacher: there is no specific initial education, only teachers already fully qualified for other subjects have access to a special qualification.

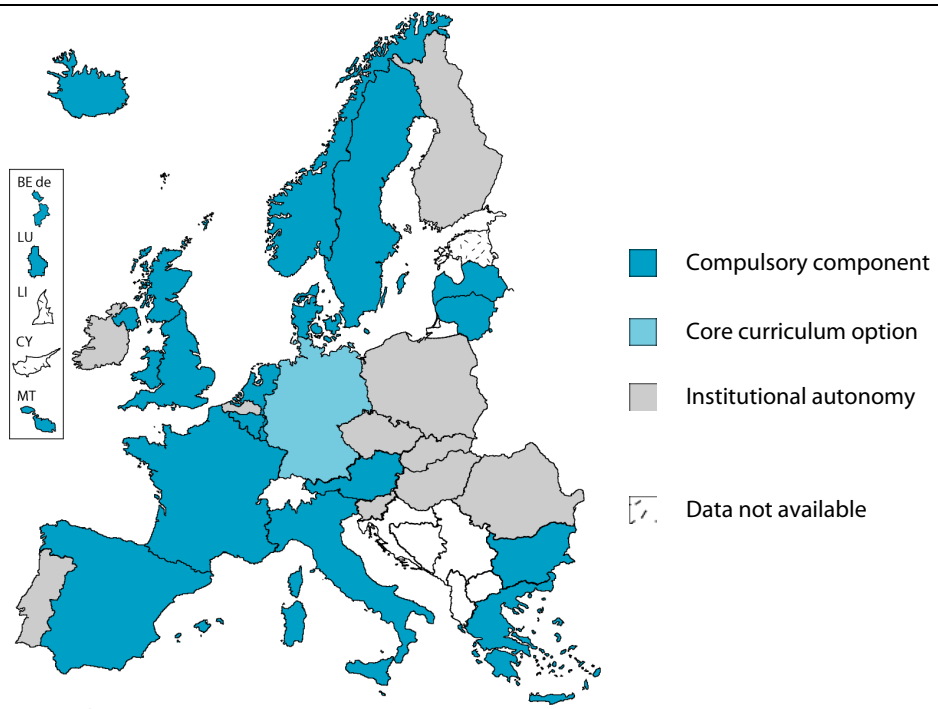
Such specific education for fully qualified teachers exists in Finland and Eastern European countries and is usually provided at university level (ISCED level 5A and 6). The length varies between one and two years. In many countries, it is also possible for teachers to obtain all seven modules of the European Computer Driving Licence. Those teachers are allowed to teach ICT.

In Belgium (German-speaking Community), Germany, Luxembourg, and the United Kingdom (Scotland) an additional teaching qualification may be awarded within the framework of in-service education courses of varying length.

ICT OFTEN INCLUDED IN INITIAL TEACHER EDUCATION

At all levels of education, ICT is included in the minimum core curricula for pupils of most European countries (see Figures B2 and B3). However, in only half of the European countries, is education in ICT either a compulsory component or forms part of the minimum qualification standards required at the end of initial education for all future teachers whether they are intending to work in primary education (Figure D3), lower or upper secondary education (Figure D4).

Figure D3: Inclusion of ICT in the initial education of all teachers (except specialist ICT teachers). Primary education (ISCED 1), 2002/03



Source: Eurydice.

Additional notes

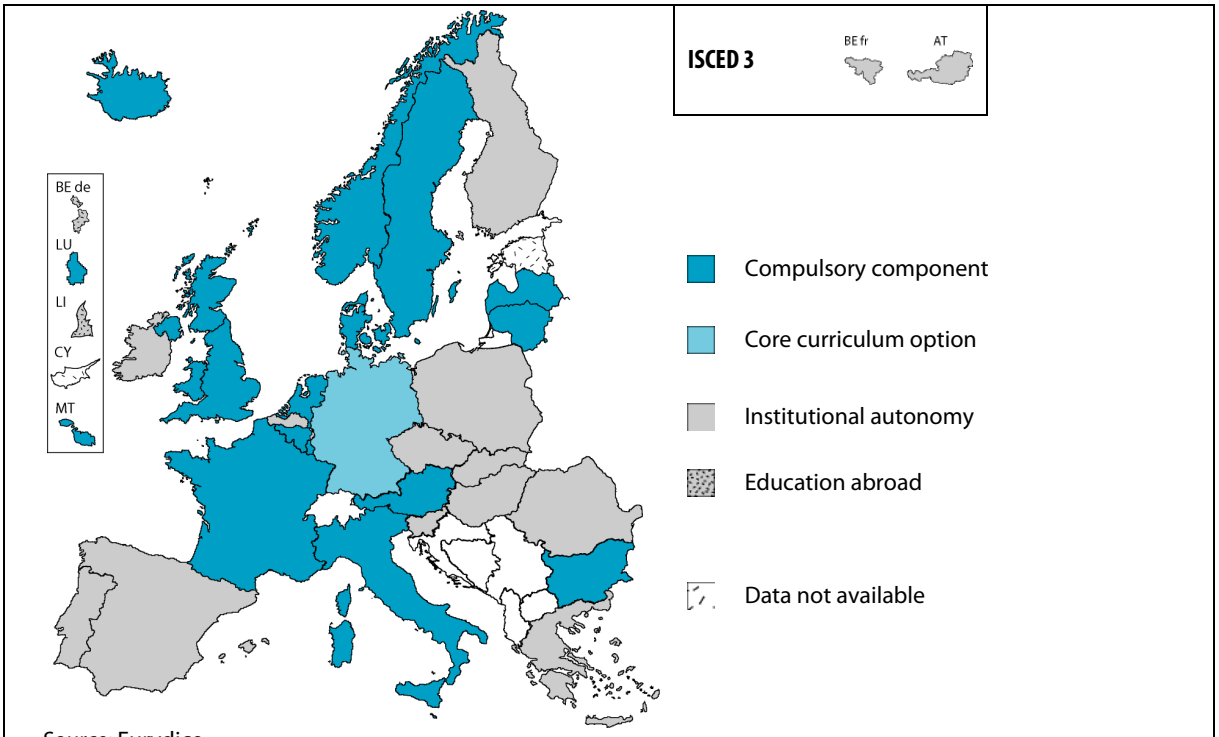
Finland: The development plan for teacher education by the Ministry of Education (2001) states that the pedagogical use of ICT must form a part of initial and further teacher education.
Poland: In accordance with new legislation concerning teacher education standards, ICT will become a compulsory part of initial teacher education from the 2003/04 academic year onwards.
Hungary: There is more than one curriculum leading to a teachers' degree for a certain education level specialising in a given subject, or range of subjects. In certain initial teacher education curricula, ICT may be included as a compulsory subject. Therefore, institutions have limited autonomy if they choose to propose such a curriculum.

Explanatory note

The term 'core curriculum option' refers to one of a range of subjects offered by institutions of teacher education, from which trainees have to select a limited number in order to cover part of their compulsory minimum curriculum. As used here, the term also implies that all institutions are obliged to include ICT in this range of subjects.

'Institutional autonomy' means that these institutions are free to decide whether education offered in ICT is compulsory or otherwise.

Figure D4: Inclusion of ICT in the initial education of all teachers (except specialist ICT teachers). General lower and upper secondary education (ISCED 2 and 3), 2002/03



Source: Eurydice.

Additional notes

Luxembourg: The information shown relates solely to the final 'on-the-job' qualifying phase, given that this is the only phase offered in Luxembourg.
Austria: The information shown relates to education for teachers intending to work at *Hauptschulen* and *Polytechnische Schulen*. Institutions offering education for teachers intending to work at *allgemeinbildende höhere Schulen* are free to decide whether to offer ICT or not.
Finland: The development plan for teacher education by the Ministry of Education (2001) states that the pedagogical use of ICT must form a part of initial and further teacher education.
Poland: In accordance with new legislation concerning teacher education standards, ICT will become a compulsory part of initial teacher education from the 2003/04 academic year onwards.
Hungary: There is more than one curriculum leading to a teachers' degree for a certain education level specialising in a given subject, or range of subjects. In certain initial teacher education curricula, ICT may be included as a compulsory subject. Therefore, institutions have limited autonomy if they choose to propose such a curriculum.

Explanatory note

The term 'core curriculum option' refers to one of a range of subjects offered by institutions of teacher education, from which trainees have to select a limited number in order to cover part of their compulsory minimum curriculum. As used here, the term also implies that all institutions are obliged to include ICT in this range of subjects.

'Institutional autonomy' means that these institutions are free to decide whether education offered in ICT is compulsory or otherwise.

In Germany, education in the teaching of ICT is one of the core curriculum options. Consequently, the institutions of teacher education concerned are obliged to offer the subject, but it is left to the trainees to decide whether or not to include it in their overall course of education. This applies to the initial education of primary and secondary school teachers.

In some countries, institutions are totally free to devise and structure their curricula as they wish. Therefore, depending on the institution concerned, education in ICT may be a compulsory subject, a core curriculum option or an optional subject. This applies to the initial education of teachers in ten countries for all levels of education considered here.

In Spain and in Greece, education in ICT is compulsory for those intending to teach at primary level. On the other hand, ICT education for future secondary school teachers depends on the institution where they undertake their initial education.

In Slovakia, the opposite situation exists: initial education of secondary school teachers has to include ICT-related components, whereas the inclusion of ICT in the initial education of primary school teachers depends on the institution they attend.

DETAILED OFFICIAL RECOMMENDATIONS ON THE TEACHING OF ICT IN SOME COUNTRIES ONLY

The compulsory nature of ICT-related education as such does not reveal anything about the actual knowledge and skills which future teachers acquire in order to use ICT for educational purposes. The official recommendations which educational authorities issue to institutions of initial teacher education provide some information concerning this matter. Figures D5 and D6 illustrate examples frequently given in official recommendations of what might be regarded as basic skills for educational use of ICT. ICT-related teacher education in the various countries may of course include categories other than those shown here.

In seven countries (Ireland, Portugal, the Czech Republic, Hungary, Poland, Romania and Slovakia), institutions providing education for future teachers in primary and secondary education are fully autonomous as regards the provision of ICT-related teaching. Not only are they free to decide whether to offer it and, if they do, to determine how much time should be devoted to such teaching (see Figure D7), but they are equally free to specify its content,

In some countries, the recommendations of the educational authorities do no more than state that teaching about ICT is mandatory, without specifying what skills should be developed and what content should be included. This applies to Denmark, Finland, Bulgaria, and Latvia.

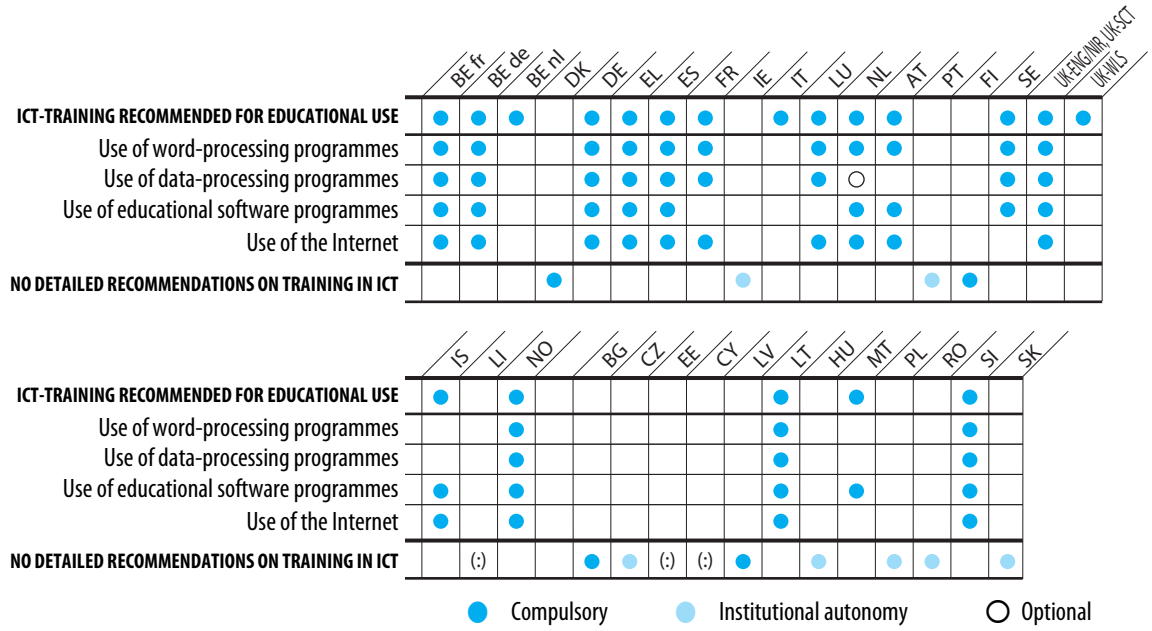
In countries in which teaching in the field of ICT is governed by documents that describe the skills to be developed during initial education and/or the skills expected of teachers on the completion of education, the detail in the recommendations may vary from one country to another. Such recommendations may be very general, as is the case in Belgium (Flemish Community), Italy or the United Kingdom (Wales).

In Belgium (French Community), Germany, France, Luxembourg, the Netherlands, Austria, the United Kingdom (England and Scotland), Iceland, Norway, Lithuania, Malta and Slovenia all or almost all the fields referred to here are recommended for future teachers in primary and secondary education. In Belgium (German-speaking Community), Greece and Spain, the recommendations are also relatively precise for primary education.

In the Netherlands and the United Kingdom, the content of ICT-related education is determined at a broad level by the standards specified for the award of the teaching qualification. The way in which the content is structured and the amount of time allocated are determined by the individual institution.

In the majority of countries in which the areas to be taught are specified, as much importance is attached to a practical command of ICT for personal use, as to mastery of it for teaching purposes. In some countries, particular importance is also attached to the development of a capacity for team-work and collaborative learning related to ICT.

Figure D5: ICT skills for educational use according to official recommendations for the initial education of all teachers (except specialist ICT teachers). Primary education (ISCED 1), 2002/03



Source: Eurydice.

Additional notes

Belgium (BE fr): The decrees of 12 December 2000 and 8 February 2001 state that teachers are trained among other things to use critically and exploit for educational purposes the media and ICT.
Belgium (BE nl): The recommendations in the basic competences specify that teachers should know how to use multimedia techniques and are able to find information about learning resources by means of IT.
Iceland: The information shown refers to education for primary and lower secondary level.

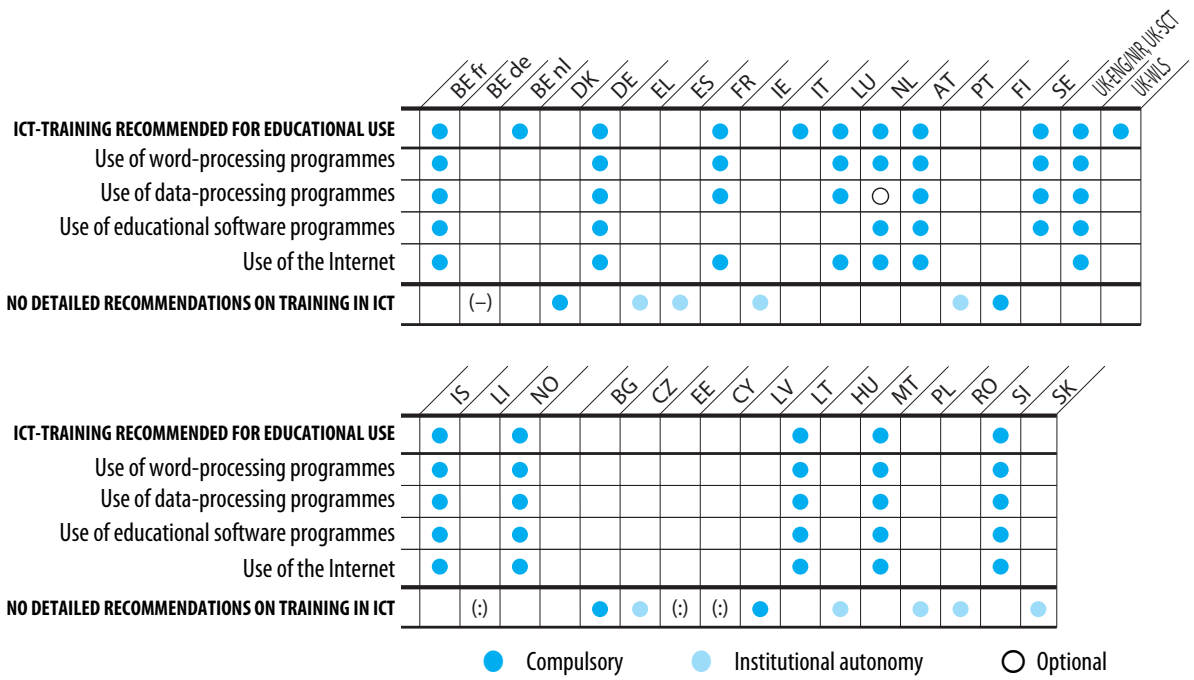
Explanatory note

Definition of concepts used in the key:

Compulsory: Also includes core curriculum options.
Institutional autonomy: Institutions of teacher education are free to decide whether they offer courses for these skills or not.
Optional: Subjects recommended as optional courses.

The areas listed were chosen as examples of what might be regarded as basic skills in the field concerned. The categories and fields listed do not necessarily correspond to the precise titles of the courses in each country.

Figure D6: ICT skills for educational use according to official recommendations for the initial education of all teachers (except specialist ICT teachers). General secondary education (ISCED 2 and 3), 2002/03



Source: Eurydice.

Additional notes

Belgium (BE fr): The decrees of 12 December 2000 and 8 February 2001 state that teachers are trained among other things to use critically and exploit for educational purposes the media and ICT.
Belgium (BE de): Initial education is provided outside the Community. Most teachers are trained in the French Community of Belgium.
Belgium (BE nl): The recommendations in the basic competences specify that teachers should know how to use multimedia techniques and are able to find information about learning resources by means of IT.
Luxembourg: The situation relates solely to the final 'on-the-job' qualifying phase.
Austria: The information shown relates to the education of teachers for the *Hauptschulen* and *Polytechnische Schulen*.
Iceland: The information shown refers to education of teachers intending to work at upper secondary level only.

Explanatory note

Definition of concepts used in the key:

Compulsory: Also includes core curriculum options.
Institutional autonomy: Institutions of teacher education are free to decide whether they offer courses for these skills or not.
Optional: Subjects recommended as optional courses.

The areas listed were chosen as examples of what might be regarded as basic skills in the field concerned. The categories and fields listed do not necessarily correspond to the precise titles of the courses in each country.

INSTITUTIONS OF INITIAL TEACHER EDUCATION ARE OFTEN FREE TO DETERMINE THE AMOUNT OF TIME DEVOTED TO EDUCATIONAL ICT

In some countries, institutions are free to decide whether or not they will offer training in ICT to prospective teachers. If they do, they may decide to make it a compulsory subject, a core curriculum option, or an optional subject. In all such instances, institutions are also free to decide on the number of hours of teaching devoted to ICT. This situation exists in Belgium (Flemish Community), Greece, Ireland, Portugal, the Czech Republic, Hungary, Poland, and Romania.

Among the countries in which ICT is a compulsory component of the initial education of all teachers, it is not always possible to indicate the proportion of time devoted to ICT in the curriculum because of the autonomy of institutions in determining the amount of teaching involved. There is no recommendation establishing a minimum amount of teaching to be allocated to ICT. This applies to Denmark, Italy, the Netherlands, Finland, the United Kingdom, Norway, Latvia, and Slovakia.

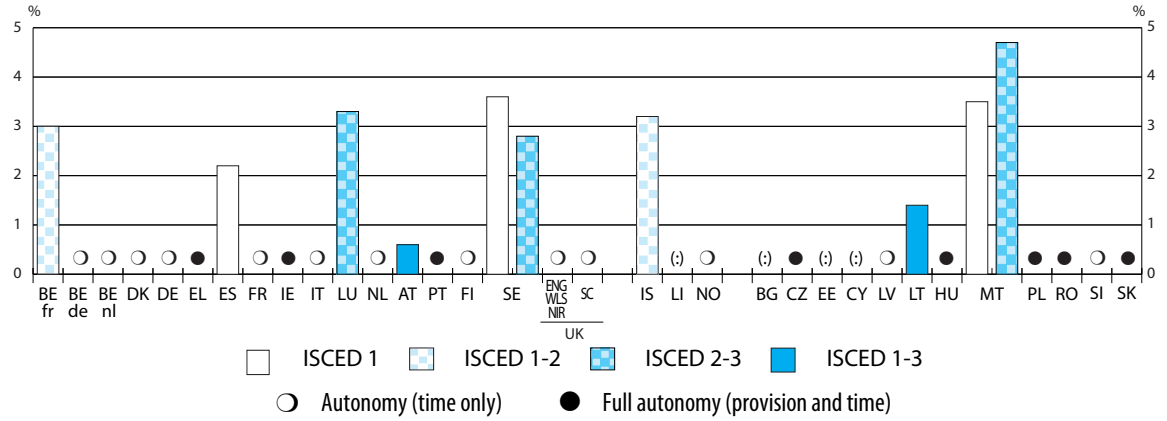
In Germany, ICT is a core curriculum option. Institutions are free to decide on the amount of teaching in the timetable that should be devoted to these core curriculum options.

The time officially recommended for ICT courses in initial education can therefore only be calculated for a few countries, namely Belgium (French Community), Spain, Luxembourg, Austria, Sweden, Iceland, Lithuania and Malta. Such calculations are generally estimates and variations may exist from one institution to another. Differences in the proportion of time devoted to ICT may be twice as much in some of these countries as in others and the proportion is especially high in Malta. However, the amount of education devoted to ICT is in general very low and is under 4 % in almost all cases.

The percentage share of ICT in teacher education is no pointer to the actual number of hours devoted to it. This varies enormously and there is no correlation between it and the foregoing percentage. This is largely attributable to differences, from one country to another, in the amount of time in the entire compulsory curriculum for initial teacher education.

The total amount of time earmarked for ICT is greatest in Sweden, Iceland and Lithuania.

Figure D7: Percentage share of compulsory teaching related to ICT, and the minimum number of hours devoted to such teaching, in the initial education of all teachers (except specialist ICT teachers). Primary and general secondary level (ISCED 1, 2 and 3), 2002/03



		BE fr	ES	LU	AT	SE		IS	LT	MT	
		ISCED 1, 2	ISCED 1	ISCED 2, 3	ISCED 1-3	ISCED 1	ISCED 2, 3	ISCED 1, 2	ISCED 1-3	ISCED 1	ISCED 2, 3
Minimum number of compulsory hours	Total	2 465	1 800	450	1 968	5 600	7 200	2 480	5 600	1 204	1 204
	ICT	75	40	15	12	200	200	80	80	42	56
Percentage		3.0	2.2	3.3	0.6	3.6	2.8	3.2	1.4	3.5	4.7

Source: Eurydice.

Additional notes

Belgium (BE fr): Institutions of teacher education for upper secondary level are free to decide on the number of hours devoted to ICT.
Belgium (BE de): Courses in ICT are compulsory in initial teacher education for primary schools, but their content is an integral part of other subjects. Initial teacher education for lower and upper secondary level is provided outside the German-speaking Community. Most teachers are trained in the French Community of Belgium.
Germany: It is each *Land*, and not its individual institutions, that is autonomous.
Luxembourg: The amount of time calculated relates solely to the final 'on-the-job' qualifying phase, given that this is the only phase offered in Luxembourg.
Austria: The figure refers to education for teachers intending to work at primary level or at *Hauptschulen* and *Polytechnische Schulen*. Because of the integrated use of ICT in teaching methodology the percentage rises to at least 1 %.
Iceland: The amount of time indicated relates to the education of student teachers enrolled at the Iceland University of Education *(Kennaraháskóli Íslands)*.

Explanatory note

Definition of concepts used in the key:

Autonomy: ICT is part of the compulsory curriculum or is a core curriculum option, but institutions of teacher education are free to decide how much time should be devoted to each subject in the curriculum.
Full autonomy: Institutions are free to decide whether or not they offer courses in ICT and if they do so, they are free to decide the amount of time devoted to ICT.
Calculation: The numbers of units devoted to ICT are expressed as percentages of the total number of separate compulsory units. These units are also expressed in hours. ICT integrated into other subjects cannot be taken into account in this calculation.
In the case of the consecutive model of teacher education (general education in one or several subjects is provided in a first phase, followed by specific teacher training in a second stage), the share of teaching devoted to ICT refers solely to the professional stage of education.

NATIONAL PROGRAMMES TO ENHANCE THE EDUCATIONAL ICT SKILLS OF TEACHERS IN SERVICE ARE VERY WIDESPREAD

Irrespective of whether it is part of initial teacher education, the acquisition of ICT-related knowledge, including the educational use of ICT, is provided in all countries within continuous professional development.

In the majority of countries, in-service education in ICT is part of a national programme to initiate, develop and improve the use of ICT by teachers. Most of these specific projects provide courses for teachers for all three levels of education. In Denmark, there are separate programmes specifically aimed at teachers working in compulsory education and those working at upper secondary level. The United Kingdom (England, Wales and Northern Ireland) and Hungary provide special projects for teachers working at lower secondary level.

The periods covered by these national programmes vary, but in most countries, they are planned for at least two years.

In some countries, teachers are only one target group of national programmes aiming at enhancing ICT knowledge of pupils as well as teachers. This is the case in Germany, Finland, Sweden, the Czech Republic, Latvia, Lithuania, and Slovenia. In general, these kinds of projects have a longer time schedule and run for at least five years.

Teachers are normally not obliged to participate in these programmes. Even in countries where in-service education is compulsory, in general teachers may choose which training is most suitable for them. However, in some countries, schools draw up education plans for their staff, in other cases, courses may be prescribed or recommended following evaluation procedures.

The names of the national programmes to enhance the ICT skills of teachers in service are available in the annex 4.

PROCESSES

AT THE AGE OF 15, THE MAJORITY OF EUROPEAN PUPILS CLAIM TO USE SCHOOL COMPUTERS REGULARLY

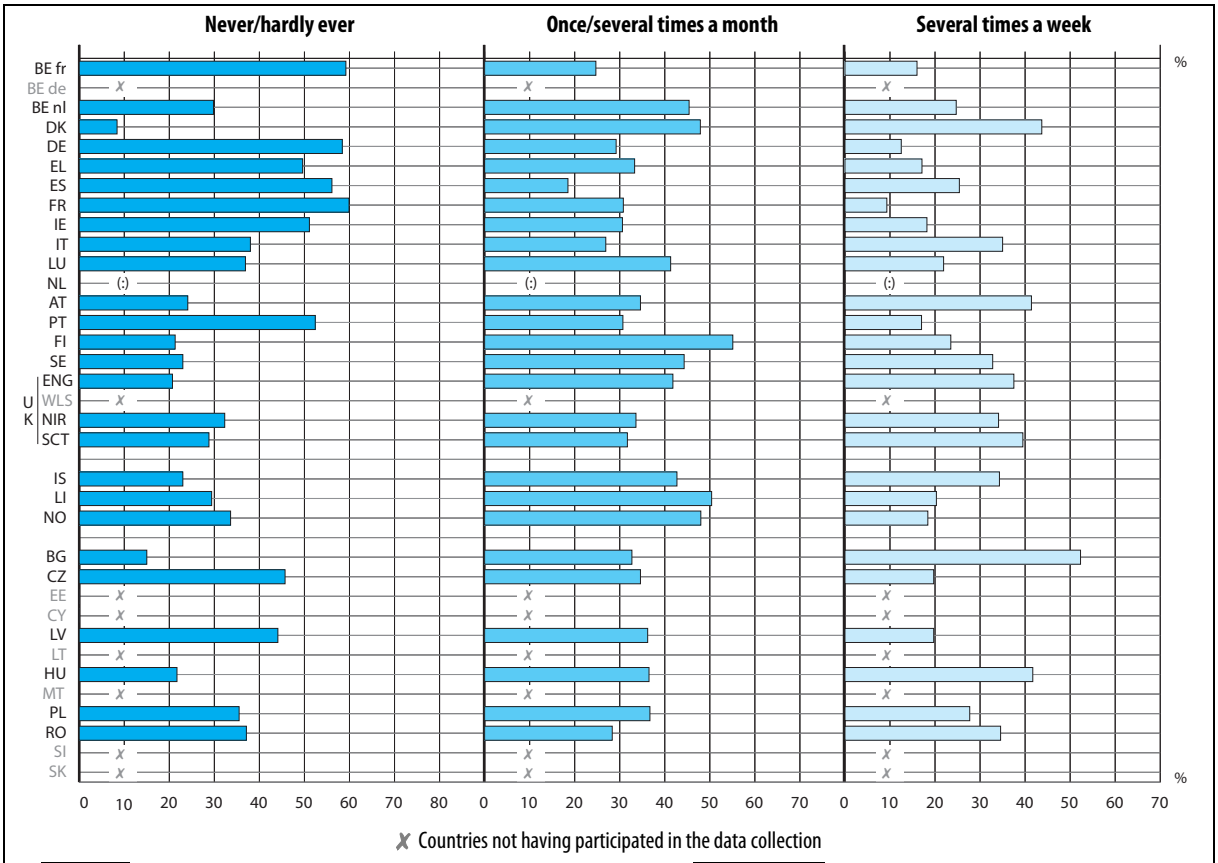
The presence of computers at school does not guarantee that they are used. Within the framework of the Pupil Questionnaire in the PISA study, 15-year-old pupils were asked to make a statement about the frequency of use of computers at school (Figure E1). Their answers highlight that the regularity of the use of computers in school activities is quite heterogeneous across countries overall.

Indeed, while on average around two-thirds of the 15-year-old European respondents (64 %) claim to use a computer at school once or several times a month, there are wide variations between countries. In some countries, the majority of pupils claim that they never – or almost never – use a computer. This is the case in particular in the French Community of Belgium, Germany and France. On the other hand, in Denmark, Austria, Bulgaria, and Hungary in particular, respondents reported using computers weekly or even daily.

A link between the level of computer equipment in schools for educational purposes and the frequency of use by the pupils can be established. Indeed, countries that feature a regular use of computers appear amongst those where the number of pupils per computer is low (Figure C2). In the same way, in general, in countries where the ratio is high, the pupils seldom use computers at school. However, there are some exceptions. In Bulgaria, more than half the pupils claim to use a computer at school several times per week in spite of the above-average number of pupils per computer (Figure C2). On the contrary, in spite of a favourable ratio, regular use of computers by pupils appears to be more limited in France.

The pupils also gave an opinion on the frequency of use of Internet at school (Figure E2). The national profiles are rather similar to those observed for the use of computers, but the frequency at which Internet is used in schools appears to be lower everywhere. Surfing on the Internet is a different, less commonly encountered activity than using a computer. Its less frequent use can be also explained by the lower connection rates found in schools (Figure C5). The use of Internet is particularly frequent in Denmark, Austria, Finland, Sweden, and Iceland. Conversely, the frequency of use is low in Spain, Italy, Latvia, and Poland.

Figure E1: Distribution of 15-year-old pupils according to their frequency of use of computers in schools, 1999/2000



	BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
	59.2	29.8	8.4	58.4	49.6	56.1	59.9	51.1	38.0	36.9	(:)	24.1	52.4	21.3	23.0	20.7	32.3	28.8	23.0	29.4	33.6	15.0	45.7	44.1	21.7	35.5	37.1
	24.7	45.4	47.9	29.2	33.3	18.5	30.8	30.6	26.9	41.3	(:)	34.6	30.7	55.1	44.3	41.8	33.6	31.7	42.7	50.4	48.0	32.7	34.6	36.2	36.5	36.7	28.3
	16.0	24.7	43.7	12.5	17.1	25.4	9.3	18.2	35.0	21.9	(:)	41.4	17.0	23.5	32.8	37.5	34.1	39.5	34.3	20.3	18.4	52.3	19.7	19.7	41.7	27.7	34.6

Source: OECD, PISA 2000 database.

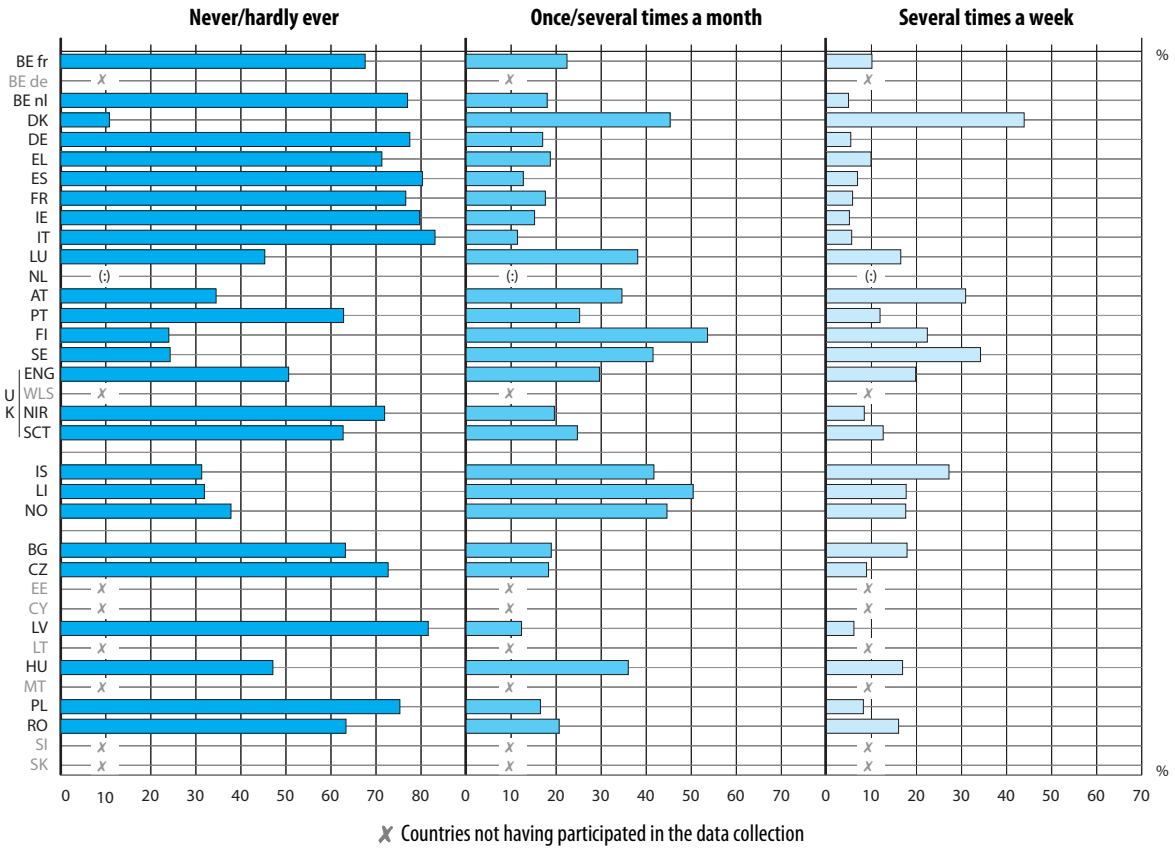
Additional note

Netherlands: The response rate to the PISA survey was considered to be too low for purposes of meaningful comparison. This is why the data ('Never/hardly ever' = 43.9; 'Once/several times a month' = 32.5; 'Several times a week' = 23.6) are not shown in the Figure. See the glossary for further details.

Explanatory note

The PISA Pupil Questionnaire includes five types of answer: (i) 'Never or hardly ever', (ii) 'A few times a year', (iii) 'About once a month', (iv) 'Several times a month' and (v) 'Several times a week'. Figure E1 narrows down these options by combining the first two ('Never or hardly ever' and 'A few times a year') under the heading 'Never/hardly ever', as well as the third and fourth to give 'Once/several times a month', and by retaining the last option unchanged ('Several times a week').

Figure E2: Distribution of 15-year-old pupils according to the frequency of use of Internet in schools, 1999/2000



	BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
	67.6	77.0	10.8	77.5	71.3	80.3	76.6	79.7	83.1	45.3	(:)	34.5	62.8	24.0	24.3	50.6	71.9	62.7	31.3	31.9	37.8	63.2	72.7	81.6	47.1	75.3	63.3
	22.4	18.0	45.3	17.0	18.7	12.7	17.6	15.2	11.4	38.1	(:)	34.6	25.2	53.6	41.5	29.6	19.6	24.7	41.7	50.4	44.6	18.9	18.3	12.3	36.0	16.5	20.7
	10.1	4.9	43.9	5.4	9.9	6.9	5.8	5.1	5.6	16.5	(:)	30.9	11.9	22.4	34.2	19.8	8.4	12.6	27.2	17.7	17.6	17.9	8.9	6.1	16.9	8.2	16.0

Source: OECD, PISA 2000 database.

Additional note

Netherlands: The response rate to the PISA survey was considered to be too low for purposes of meaningful comparison. This is why the data ('Never/hardly ever' = 57.1; 'Once/several times a month' = 25.9; 'Several times a week' = 17) are not shown in the Figure. See the glossary for further details.

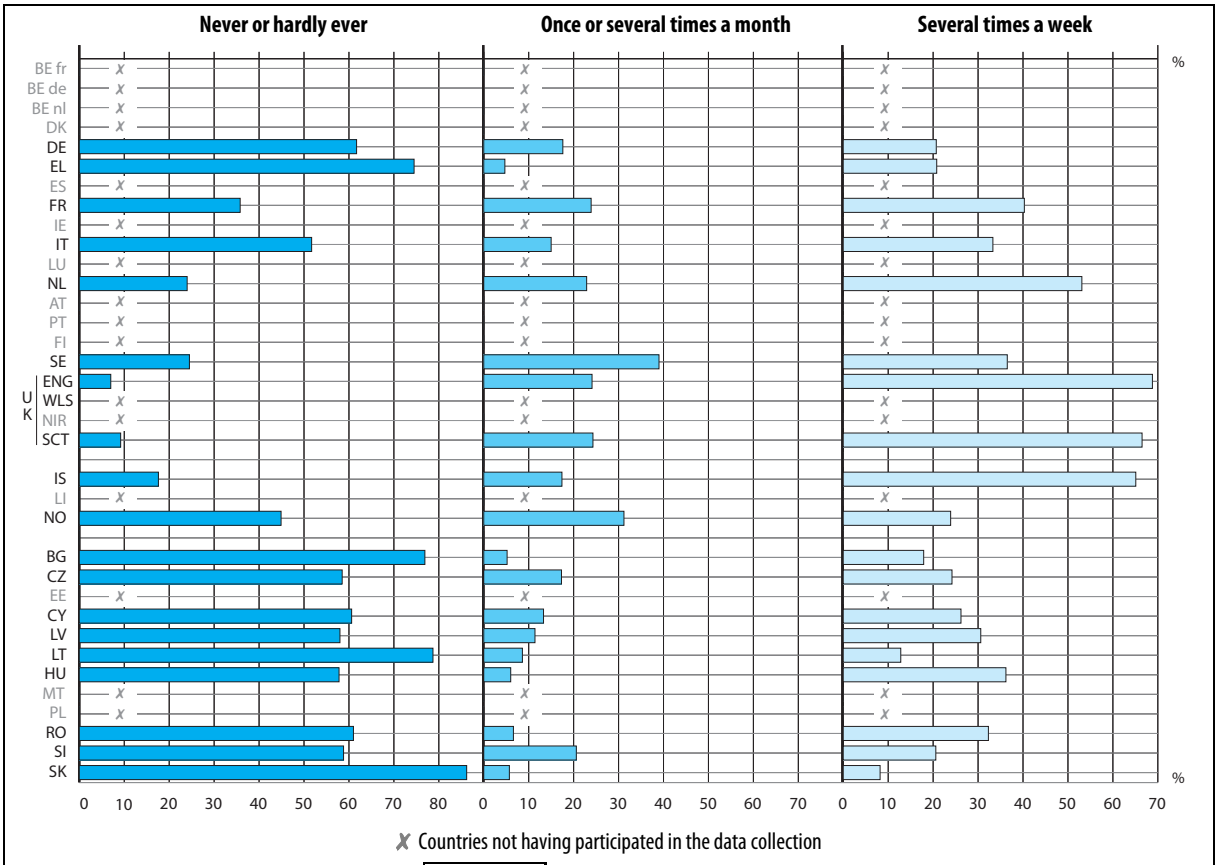
Explanatory note

The PISA Pupil Questionnaire includes five types of answer: (i) 'Never or hardly ever', (ii) 'A few times a year', (iii) 'About once a month', (iv) 'Several times a month' and (v) 'Several times a week'. Figure E2 narrows down these options by combining the first two ('Never or hardly ever' and 'A few times a year') under the heading 'Never/hardly ever', as well as the third and fourth to give 'Once/several times a month', and by retaining the last option unchanged ('Several times a week').

PUPILS AGED 9 OR 10 SELDOM USE COMPUTERS AT SCHOOL

Despite wide variations across countries, the data indicate **low frequency** of computer use by children in the fourth year of primary school (grade 4). On average, virtually half of these pupils 'never/hardly ever' use the computer at school. This situation is most marked in Greece, Bulgaria, Lithuania, and Slovakia in which the percentages are highest.

Figure E3: Frequency of computer use by grade 4 pupils in schools, 2000/01



	DE	EL	FR	IT	NL	SE	UK ENG	UK SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
	61.7	74.5	35.8	51.7	24	24.5	7.0	9.2	17.6	44.9	76.9	58.5	60.6	58.0	78.7	57.8	61.0	58.8	86.2
	17.6	4.7	23.9	15.0	22.9	39.0	24.1	24.3	17.4	31.2	5.2	17.3	13.3	11.4	8.6	6.0	6.6	20.6	5.7
	20.7	20.8	40.3	33.3	53.1	36.5	68.8	66.5	65.1	23.9	17.9	26.2	24.2	30.6	12.8	36.2	32.3	20.6	8.2

Source: IEA, PIRLS 2001 database.

Explanatory note

The PIRLS questionnaires have four types of answer: (i) 'every day or almost every day', (ii) 'Once or twice a week', (iii) 'Once or twice a month' and (iv) 'Never or almost never'. To facilitate the comparison of Figure E3 with Figure E1, these answers are grouped into three categories: 'Never/hardly ever', 'Once/several times a month' and 'Several times a week'.

In Europe, on average, a third of pupils in the fourth year of primary education (33.6 % on average) use a school computer 'Several times a week'. The highest percentages are reported in the Netherlands, the United Kingdom (England and Scotland) and Iceland.

In comparison with 15-year-old pupils at the end of compulsory education, the use of computers by pupils in the fourth year of primary education seems to be more 'polarised'. They use them either very regularly, or seldom or never. In the category 'Once/several times a month', percentages are relatively low (16.6 % on average) whereas 51.4 % of the 15-year-old pupils fall into this category (Figure E1).

WRITING AND SEARCHING FOR INFORMATION USING ICT ARE KEY ACTIVITIES FOR PUPILS AGED 9 OR 10 IN MOST COUNTRIES

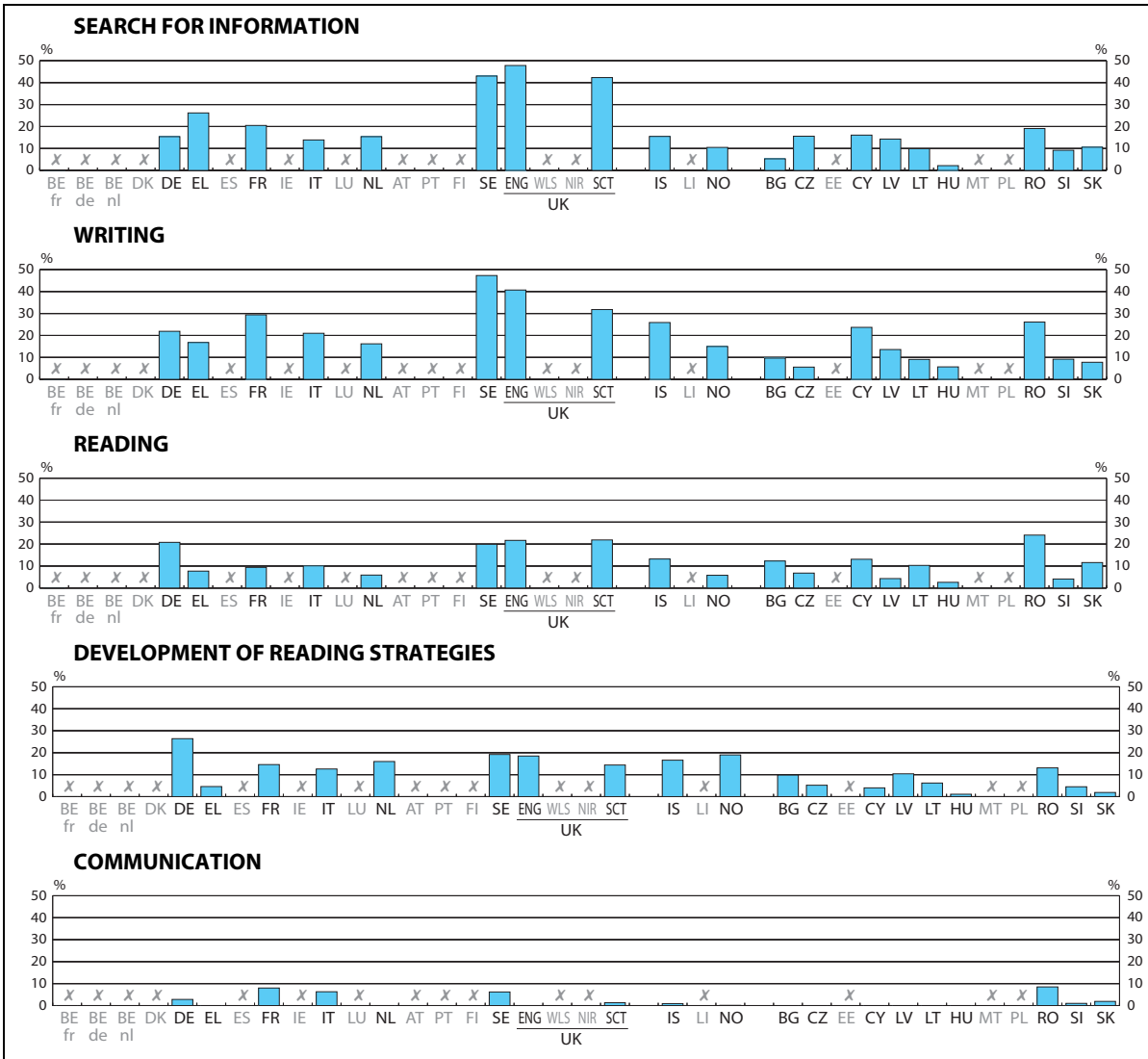
Overall, the two most common computer activities for grade 4 pupils are those related to **writing** and the **search for information**. Percentages pertaining to both types of activity are fairly similar, except in the Czech Republic in which the 'writing' activity is almost three times lower than the 'search for information' activity. It should be noted that access to computers as described in Figure C9 (which distinguishes between computers located inside or outside the class) does not have any impact on the frequency of these types of activity.

The highest percentages for both categories are reported in Sweden and in the United Kingdom (England and Scotland).

A similar proportion of pupils are involved in the **reading** activities of 'reading' and 'development of reading strategies' at least once a week – on average between 11.9 % and 11.5 %, respectively. In some countries, these two activities account for percentages higher than those for 'writing' and/or the 'search for information'. In Bulgaria, Lithuania, and Slovakia, reading even seems to be the main use of computers. The activity 'development of reading strategies' is most widespread in Germany and Norway.

The proportion of pupils who use a computer at least once a week for **communication** purposes appears to be negligible (1.9 % on average) in most countries. In nine countries (Greece, the Netherlands, the United Kingdom (England), Bulgaria, the Czech Republic, Cyprus, Lithuania, Latvia and Hungary), no pupils claim to use a computer that regularly.

Figure E4: Proportion of grade 4 pupils using computers at least once a week to search for information, write and read texts, develop reading strategies and communicate at school, 2000/01



✗ Countries not having participated in the data collection

							U K												
	DE	EL	FR	IT	NL	SE	ENG	SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
Search for information	15.4	26.2	20.5	13.9	15.4	43.0	47.8	42.3	15.5	10.5	5.3	15.6	16.1	14.3	9.9	2.2	19.1	9.2	10.6
Writing	21.9	16.8	29.4	21.0	16.2	47.3	40.7	31.8	25.9	15.0	9.7	5.6	23.7	13.6	9.1	5.7	26.1	9.2	7.8
Reading	20.8	7.7	9.4	10.1	5.9	19.9	21.7	21.9	13.2	5.8	12.3	6.8	13.1	4.3	10.3	2.6	24.1	4.1	11.6
Development of reading strategies	26.4	4.6	14.6	12.6	16.0	19.2	18.5	14.4	16.6	19.0	9.8	5.2	4.0	10.4	6.2	1.1	13.1	4.5	1.9
Communication	2.8	0.0	8.0	6.3	0.0	6.2	0.0	1.3	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	8.5	1.0	1.9

Source: IEA, PIRLS 2001 database.

GLOSSARY

Country codes

EU	European Union
BE	Belgium
BE fr	Belgium – French Community
BE de	Belgium – German-speaking Community
BE nl	Belgium – Flemish Community
DK	Denmark
DE	Germany
EL	Greece
ES	Spain
FR	France
IE	Ireland
IT	Italy
LU	Luxembourg
NL	Netherlands
AT	Austria
PT	Portugal
FI	Finland
SE	Sweden
UK	United Kingdom
UK-ENG	England
UK-WLS	Wales
UK-NIR	Northern Ireland
UK-SCT	Scotland

EFTA/EEA countries	The three countries of the European Free Trade Association which are members of the European Economic Area
IS	Iceland
LI	Liechtenstein
NO	Norway

Candidate countries (during preparation of the publication)

BG	Bulgaria
CZ	Czech Republic
EE	Estonia
CY	Cyprus
LV	Latvia
LT	Lithuania
HU	Hungary
MT	Malta
PL	Poland
RO	Romania
SI	Slovenia
SK	Slovakia

Abbreviations of statistical tools and other classifications

(:)	Data not available
(–)	Not applicable
GDP	Gross domestic product
PPS	Purchasing Power Standard

International Standard Classification of Education (ISCED 1997)

The international standard classification of education (ISCED) is an instrument suitable for compiling statistics on education internationally. It covers two cross-classification variables: levels and fields of education with the complementary dimensions of general/vocational/pre-vocational orientation and educational/labour market destination. The current version, ISCED 97 ([1]) distinguishes seven levels of education.

ISCED 97 LEVELS

Empirically, ISCED assumes that several criteria exist which can help allocate education programmes to levels of education. Depending on the level and type of education concerned, there is a need to establish a hierarchical ranking system between main and subsidiary criteria (typical entrance qualification, minimum entrance requirement, minimum age, staff qualification, etc.).

ISCED 0: Pre-primary education

Pre-primary education is defined as the initial stage of organised instruction. It is school- or centre-based and is designed for children aged at least three years.

ISCED 1: Primary education

This level begins between four and seven years of age, is compulsory in all countries and generally lasts from five to six years.

ISCED 2: Lower secondary education

It continues the basic programmes of the primary level, although teaching is typically more subject-focused. Usually, the end of this level coincides with the end of compulsory education.

ISCED 3: Upper secondary education

This level generally begins at the end of compulsory education. The entrance age is typically 15 or 16 years. Entrance qualifications (end of compulsory education) and other minimum entry requirements are usually needed. Instruction is often more subject-oriented than at ISCED level 2. The typical duration of ISCED level 3 varies from two to five years.

ISCED 4: Post-secondary non-tertiary education

These programmes straddle the boundary between upper secondary and tertiary education. They serve to broaden the knowledge of ISCED level 3 graduates. Typical examples are programmes designed to prepare pupils for studies at level 5 or programmes designed to prepare pupils for direct labour market entry.

ISCED 5: Tertiary education (first stage)

Entry to these programmes normally requires the successful completion of ISCED level 3 or 4. This level includes tertiary programmes with academic orientation (type A) which are largely theoretically based and tertiary programmes with occupation orientation (type B) which are typically shorter than type A programmes and geared for entry into the labour market.

ISCED 6: Tertiary education (second stage)

This level is reserved for tertiary studies that lead to an advanced research qualification (Ph.D. or doctorate).

([1]) http://unescostat.unesco.org/en/pub/pub0.htm

PISA and PIRLS Data

PISA (Programme for International Student Assessment): an international survey conducted under the auspices of the OECD in 32 countries worldwide, including 26 countries involved in the SOCRATES Programme. The aim of the survey is to measure the performance level of pupils aged 15 in reading literacy, mathematical literacy and scientific literacy. Data collection has been programmed in three stages, namely PISA 2000 (used to prepare the present publication), PISA 2003 and PISA 2006.

Among the countries covered by the Socrates Programme, Belgium (the German speaking Community), the United Kingdom (Wales), Estonia, Cyprus, Lithuania, Malta, Slovenia and Slovakia did not take part in the collection of data for PISA 2000.

Besides measurements of outcome (tests in reading, mathematics and science), the survey includes questionnaires for pupils and school heads, which are intended to identify variables linked to family and school circumstances that may help explain the findings. It is these questionnaires that have been used to prepare the indicators in the present publication.

The survey is based on representative samples of 15-year-old pupils in secondary education, who were selected by their school. Education at each school may last a greater or lesser number of years corresponding to curricula at ISCED levels 2 and/or 3, or in some cases even ISCED level 1. This explains why the titles to Figures in the present publication refer to schools attended by pupils aged 15 and not secondary education in general.

PIRLS (Progress in International Reading Literacy Study): an international survey conducted in 2001 under the auspices of the International Association for the Evaluation of Educational Achievement (IEA) in 35 countries worldwide, including 19 involved in the Socrates Programme. The aim of this survey is to measure the performance levels of pupils in reading comprehension, in the fourth year of primary education. In the majority of countries these pupils are aged 9 or 10.

Among the countries covered by the SOCRATES Programme, Belgium, Denmark, Spain, Ireland, Luxembourg, Austria, Portugal, Finland, the United Kingdom (Wales and Northern Ireland), Liechtenstein, Estonia, Malta and Poland did not take part in the data collection.

In addition to measurements of outcome (tests in reading), the survey includes questionnaires for pupils, their parents, teachers and school heads, which are intended to identify variables linked to family and school circumstances that may help explain the findings among pupils. It is these questionnaires that have been used to prepare the indicators in the present publication.

The survey is based on representative samples of fourth-year classes in primary school. These classes are given in schools able to offer provision lasting a greater or lesser number of years.

Further observations on PISA and PIRLS

The indicators derived from the OECD/PISA and IEA/PIRLS databases have to be interpreted in context. For example, the percentage of pupils aged 15 who said they had a computer at home cannot be interpreted as the percentage of families with a computer. Neither can the percentage of pupils in the fourth year of primary school who said they had a computer at home.

Where the number of replies to the surveys in general, or to one particular question, is insufficient to ensure that the data are truly representative, the latter are not shown in the Figures. In the case of the Netherlands, in which the proportion of those who did not reply to the PISA 2000 survey is relatively high, the data are not given in the Figures, but in an additional note under them. It should be noted that a study carried out in this country after publication of the PISA findings showed that, despite its low rate of response, the sample remained representative.

Definition of statistical tools and notes on the calculations

Correlation coefficient: The correlation coefficient indicates the degree of association between two variables, of which the values may vary within the limits from -1 to +1. Negative values of the correlation coefficient reflect an inverse relationship between the two variables: the values of one variable decrease as the values of the other variable increase. For instance, the coefficient of variation between the age of an individual and his remaining life expectancy tends to -1. When the values of two variables increase or decrease more or less simultaneously, the correlation coefficient is positive. For instance, there is a positive correlation between the size of an individual and the size of his feet. The closer a correlation approaches -1 or +1, the stronger the relationship between the two variables. A correlation coefficient with a value of 0 reflects the absence of any relationship between the two variables.

Percentile: A percentile is a value on a scale of one hundred that indicates the percent of a distribution that is equal to or below this value. The median is defined conveniently as the 50^{th} percentile. For example, the smallest test score which is, greater than 90 % of the scores of the people taking the test, is said to be at the 90th percentile. In short, percentiles are the 99 values that divide a set of statistical data or a frequency distribution into 100 sub-divisions, each containing the same (or approximately the same) number of individuals.

Purchasing Power Standard: Purchasing Power Standard (PPS) shall mean the artificial common reference currency unit used in the European Union to express the volume of economic aggregates for the purpose of spatial comparisons in such a way that price level differences between countries are eliminated. Economic volume aggregates in PPS are obtained by dividing their original value in national currency units by the respective PPP. PPS thus buys the same given volume of goods and services in all countries, whereas different amounts of national currency units are needed to buy this same volume of goods and services in individual countries, depending on the price level.

Standard error: The standard error corresponds to the standard deviation of the sampling distribution of a population parameter. It is a measure of the degree of uncertainty associated with the estimate of a population parameter inferred from a sample. Indeed, due to the randomness of the sampling procedure, one could have obtained a different sample from which a more or less different results could have been inferred. Suppose that, based on a given sample, the estimated population average were 10 and the standard error associated with this sample estimate were two units. One could then infer with 95 % confidence that the population average must lie between 10 plus and 10 minus two standard deviations, i.e. between 6 and 14.

ANNEXES

Annexe 1

Correlation coefficients for the socio-economic level, the father's level of qualification and mother's level of qualification, and the number of home computers and availability of at least one home computer respectively,1999/2000

	Number of computers			Availability of at least 1 computer		
	Socio-economic level	Father's level of qualification	Mother's level of qualification	Socio-economic level	Father's level of qualification	Mother's level of qualification
BE fr	0.37	0.24	0.26	0.27	0.19	0.21
BE nl	0.35	0.22	0.24	0.23	0.18	0.21
DK	0.28	0.22	0.17	0.16	0.11	0.15
DE	0.30	0.22	0.21	0.22	0.13	0.19
EL	0.32	0.28	0.28	0.32	0.28	0.27
ES	0.39	0.35	0.33	0.33	0.31	0.3
FR	0.31	0.27	0.24	0.29	0.24	0.23
IE	0.25	0.21	0.16	0.24	0.20	0.17
IT	0.28	0.28	0.24	0.25	0.25	0.22
LU	0.34	0.33	0.25	0.24	0.27	0.21
NL	(:)	(:)	(:)	(:)	(:)	(:)
AT	0.28	0.25	0.22	0.22	0.19	0.18
PT	0.46	0.37	0.37	0.43	0.34	0.34
FI	0.29	0.26	0.22	0.24	0.20	0.16
SE	0.27	0.19	0.16	0.11	0.11	0.11
UK-ENG	0.17	0.15	0.13	0.17	0.13	0.12
UK-NIR	0.16	0.17	0.13	0.19	0.19	0.18
UK-SCT	0.11	0.09	0.09	0.15	0.12	0.11
IS	0.15	0.15	0.13	0.10	0.11	0.10
LI	0.16	0.23	0.19	0.03	0.11	0.09
NO	0.22	0.17	0.17	0.16	0.11	0.12
BG	0.32	0.25	0.25	0.33	0.26	0.28
CZ	0.35	0.32	0.33	0.33	0.30	0.33
LV	0.13	0.17	0.13	0.17	0.19	0.16
HU	0.39	0.4	0.39	0.38	0.39	0.40
PL	0.32	0.33	0.34	0.34	0.35	0.35
RO	0.51	0.39	0.41	0.50	0.39	0.41

Source: OECD, PISA 2000 database.

Annexe 2

National or official bodies responsible for supervising and/or promoting national policy for ICT in education, 2002/03

	Name of the body	Website
BE fr	Communauté française de Belgique	http://www.cfwb.be/
	AGERS (General Administration for Education and Scientific Research)	http://www.enseignement.be/prof/dossiers/tice/index.asp
BE de	Ministerium der Deutschsprachigen Gemeinschaft, Abteilung Unterrichtswesen, Verwaltungswebsite (Ministry of the German speaking Community, Education department, administration website)	http://www.unterrichtsverwaltung.be/
	Ministerium der Deutschsprachigen Gemeinschaft, Abteilung Unterrichtswesen, Pädagogischer Website (Ministry of the German speaking Community, Education department, educational website)	http://www.learnbox.be/
BE nl	Ministerie van de Vlaamse Gemeenschap, departement onderwijs (Ministry of the Flemish Community, Education department)	http://www.ond.vlaanderen.be/ict
DK	Undervisningsministeriet (Ministry of Education)	http://www.uvm.dk/
	UNI*C	http://www.uni-c.dk/

	Name of the body	Website
DE	**Kultusministerien/Wissenschaftsministerien (Länder)** (Ministries of Education and Cultural Affairs/Ministries of Science *(Länder)*)	http://www.kmk.org/aktuell/home.htm?links
	Bundesministerium für Bildung und Forschung (Bund) (Federal Ministry of Education and Research (Bund))	www.bmbf.de
EL	**Pourgeio Ethnikis Paedeias kai Thriskevmaton (YP.E.P.TH.)** (Ministry for National Education and Religious Affairs)	www.ypepth.gr
	EAITY (Research Academic Computer Technology Institute – RACTI)	www.cti.gr
	Paedagogiko Institouto (Pedagogical Institute)	www.pi-schools.gr
	Grafeio tis koinonias tis pliroforias (Information Society Office)	www.ypepth.gr/ktp/
ES	**Centro Nacional de Información y Comunicación Educativa – CNICE** (National Centre for Information and Communication in Education) **(Ministerio de Educación, Cultura y Deporte)** (Ministry of Education, Culture and Sport)	http://www.cnice.mecd.es/
	Ministerio de Ciencia y Tecnología (Ministry of Science and Technology)	http://www.mcyt.es/
	Xarxa Telemática Educativa de Catalunya (Educational Telematic Network in Catalunya)	http://www.xtec.es/
	Centro Multimedia de Galicia (Galician Multimedia Centre)	http://www.xunta.es/conselle/cultura/cmg/
	Red Telemática Educativa de Andalucía (Educational Telematic Network in Andalucía)	http://www.juntadeandalucia.es/averroes/
FR	**Ministère de la jeunesse, de l'éducation nationale et de la recherche, direction de la technologie** (Ministry of Youth, National Education and Research, Technology Department)	http://www.educnet.education.fr/
IE	**Department of Education & Science**	http://www.education.ie/
	National Centre for Technology in Education	http://www.ncte.ie/
	National Council for Curriculum & Assessment	http://www.ncca.ie/
IT	**MIUR – Ministero dell'Istruzione dell'Università e della Ricerca** (Ministry of Higher education and Research)	http://www.istruzione.it/
LU	**Centre de Technologie – CTE** (Technology Centre)	http://www.cte.lu/
	Service de Coordination de la Recherche et de l'Innovation Pédagogique et Technologique (Coordination Service for Research and Educational and Technological Innovation)	http://www.script.lu/
NL	**Ministerie van Onderwijs, Cultuur en Wetenschap** (ICT department)	http://www.ictonderwijs.nl/
	Kennisnet (Organisation of the educational portal site and network)	http://www.kennisnet.nl/
	Surfnet (Organisation of the educational network for higher education)	http://www.surfnet.nl/
	Stichting ICT op School (Maintenance cooperation between schools and local authorities, commercial development of the educational use of ICT and innovation in its use)	http://www.ictopschool.net/
	Expertise centre (Support for the development of educational multimedia projects)	
	Pedagogical Centre (Support for schools)	http://www.kpcgroep.nl/kennisonline/index.asp http://www.cps.nl/ http://www.aps.nl/ict
	Dutch educational inspectorate (Management and development of ICT policies)	http://www.owinsp.nl/
AT	**Bundesministerium für Bildung, Wissenschaft und Kultur** (Federal Ministry of Education, Science and Culture)	http://www.efit.at/
PT	**DAPP – Programme Nonio XXI Century**	http://www.nonioxxi.pt/

	Name of the body	Website
FI	Opetusministeriö – Undervisningsministeriet (Ministry of Education)	http://www.minedu.fi/
	Opetushallitus – Utbildningsstyrelsen (National Board of Education)	http://www.oph.fi/
	SITRA (Finnish National Fund for Research and Development)	http://www.sitra.fi/
SE	Myndigheten för skolutveckling (The Swedish National Agency for School Improvement)	http://www.skolutveckling.se/
UK-ENG **UK-WLS** **UK-NIR**	British Educational Communications and Technology Agency – Becta	http://www.becta.org.uk/index.cfm
UK-ENG **UK-WLS** **UK-NIR**	New Opportunities Fund	http://www.nof.org.uk/
UK-ENG	Teacher Training Agency	http://www.tta.gov.uk/
UK-ENG	Department for Education and Skills	http://www.dfes.gov.uk/index.htm
UK-ENG **UK-WLS**	Local Education Authorities	
UK-WLS	National Assembly for Wales Department for Training and Education	http://www.learning.wales.gov.uk/
UK-NIR	Department of Education	http://www.deni.gov.uk
UK-NIR	Education and Library Boards	
UK-NIR	Education Technology Strategic Management Group	http://www.class-ni.org.uk/etstrategy/etstrat/index.htm
UK-SCT	Learning and Teaching Scotland	http://www.ltscotland.org.uk/
IS	Menntamálaráðuneytið (Ministry of Education, Science and Culture)	http://www.menntamalaraduneyti.is/
LI	Schulamt, Arbeitsstelle Schulinformatik (Office for Education, Department for technology in education)	http://www.schulnetz.li/
NO	Utdannings- og forskningsdepartementet (Ministry of Education and Research)	http://www.dep.no/ufd/
	Læringsenteret (Norwegian Board of Education)	http://ls.no
	Forsknings- og kompetansenettverk for IT i utdanning (ITU) (Network for IT-Research and Competence in Education)	http://www.itu.no
BG	Ministerstvo na obrazovanieto i naukata (Ministry of Education and Science)	http://www.minedu.government.bg/
CZ	Ministerstvo školství, mládeže a tělovýchovy (Ministry of Education, Youth and Sports)	http://www.msmt.cz/, http://www.e-gram.cz/
	Koordinační centrum (Coordinating Centre of the Ministry of Education, Youth and Sports)	
	Ministerstvo informatiky (Ministry of Informatics)	http://www.micr.cz/
EE	(:)	
CY	(:)	
LV	Izglītības un zinātnes ministrija (Ministry of Education and Science)	http://www.izm.gov.lv/
	Izglītības satura un eksaminācijas centrs (Centre for Curriculum Development and Examination)	http://www.isec.gov.lv/
	Latvijas Universitāte (University of Latvia)	http://www.lu.lv/
	LIIS projekta uzraudzības padome (Latvian Education Computerisation System Surveillance Board)	http://www.liis.lv/

	Name of the body	Website
LT	Švietimo ir mokslo ministerija (Ministry of Education and Science)	http://www.smm.lt/
	Švietimo informacinių technologijų centras (Centre of Information Technologies for Education)	http://www.ipc.lt/
HU	Oktatási Minisztérium (Ministry of Education)	http://www.om.hu/
	Sulinet Iroda (Office of the [Hungarian] Schoolnet Programme)	http://www.sulinet.hu/
	Megyei Pedagógiai Intézetek (Regional Pedagogical Institutes)	
	Informatikai és Hírközlési Minisztérium (Ministry of Informatics and Communication)	http://www.ihm.gov.hu/
	Oktatási Minisztérium (Ministry of Education)	http://www.om.hu/
	Kormányzati Informatikai és Társadalmi Kapcsolatok Hivatala (Bureau of Governmental ICT Policy and Civil Relations)	http://www.kancellaria.gov.hu/hivatal/informatika/
MT	Education Division – Ministry of Education	http://www.education.gov.mt/
PL	Ministerstwo Edukacji Narodowej i Sportu (Ministry of National Education and Sport)	http://www.menis.gov.pl/
RO	Consiliul pentru Informatizarea Educației Naționale (ICT Council of the Ministry of Education)	http://www.edu.ro/
	Comisia Națională pentru Informatică (National Commission for ICT)	http://www.cni.ro/
	Consiliul pentru Coordonarea RoEduNet (Council for Coordination of the Romanian Education Network)	http://www.roedu.net/
SI	Svet za informatizacijo šolstva (Council for Computerisation of Schools); supported by a group of experts	http://www.mszs.si/slo/solstvo/informatizacijaviz/ http://www.zrss.si
SK	Ministerstvo školstva SR, metodické centra (Ministry of Education)	http://www.education.gov.sk/
	Infovek (Project for ICT development)	http://www.infovek.sk/

Source: Eurydice.

Annexe 3

Relationship between the average number of 15-year-old pupils per school computer and per capita GDP expressed in PPS (1999/2000)

																UK		
	BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	ENG	NIR	SCT
Number of pupils per computer	18.2	10.5	8.4	22.8	57.9	23.7	12.3	15.3	15.3	9.6	(:)	10.1	67.4	9.3	8.9	8.2	6.9	5.5
GDP 2000	106.4	106.4	115.5	102.0	66.0	83.4	103.8	115.1	101.3	198.7		114.4	70.4	104.1	109.1	103.9	103.9	103.9

	IS	LI	NO	BG	CZ	LV	HU	PL	RO
Number of pupils per computer	10.7	7.2	6.5	46.6	19.6	31.5	12.0	28.5	50.8
GDP 2000	114.7		147.0	24.5	59.6	31.5	48.8	41.4	23.1

Correlation coefficient = -0.34

Source: OECD, PISA 2000 database; GDP 2001: Eurostat, data obtained in February 2004.

Annexe 4

National programmes to enhance the ICT skills of teachers in service (ISCED 1, 2, 3), 2002/03

	Name of the programme	Period covered	ISCED levels
BE fr	Plan stratégique en matière d'intégration des TIC à l'école	2003-2010	1-3
BE de	Einführung in MacOSX	since 2001	1
	Erstellung einer Schul-homepage	since 2000	1-3
	Verwendung des Internets im Unterricht	since 2000	1-3
BE nl	Regionale expertisenetwerken	2000-2005	1-3
DK	Skole-IT	since 2000	1-2
	Gymnasie-IT	since 2000	3
DE	Neue Lernwelten	1998-2003	1-3
	SEMIK (Systematische Einbeziehung von Medien, Informations- u. Kommunikationstechnologien in Lehr- und Lernprozesse)	1998-2003	1-3
	e-nitiative.nrw: Netzwerk für Bildung	Continuing	1-3
	Fortbildung online für Lehrerinnen und Lehrer	Continuing	1-3
	Net@school	Continuing	1-3
	InfoSchul	1997-2002	1-3
	Schulen ans Netz e.V	Continuing	1-3
EL	In-service training on the integration of ICTs in the Teaching Practice	since January 2002	1-3
ES	Programa de formación del profesorado del CNICE	since 1998	1-3
FR	(–)		
IE	Teaching Skills Initiative	since 1998	1-3
IT	Piano nazionale di formazione degli insegnanti sulle Tecnologie dell'Informazione e della Comunicazione (FOR TIC)	2003-2004	1-3
LU	(–)		
NL	Grassroots	since 2002	1-3
	DRO (Digital Drivers Licence)	since 2000	1-3

National programmes to enhance the ICT skills of teachers in service (ISCED 1, 2, 3), 2002/03

	Name of the programme	Period covered	ISCED levels
AT	Intel – Lehren für die Zukunft	since 2000	1-3
PT	Formação Contínua e Especializada nos Ensinos Básico e Secundário	2000-2006	1-3
FI	OPE.FI	1996-2004	1-3
SE	ITiS (Nationellt program för IT i skolan)	1999-2002	1-3
UK-ENG UK-WLS UK-NIR	NOF (New Opportunities Fund) Training	1999-2002	1-3
UK-ENG	Training on the implantation of the ICT strand within the Key Stage 3 strategy	2002-2003	2
UK-SCT	NOF (New Opportunities Fund) ICT Training Programme for Teachers & School Librarians	1999-2002	1-3
	ICT Masterclass Programme	since 2002	1-3
IS	(–)		
LI	(:)		
NO	LærerIKT	2002-2004	1-3
BG	Strategia za vuviejdanie na IKT v srednoto obrazovanie (Strategy for introducing ICTs in secondary Education)	since 2003	1-3
CZ	Státní informační politika ve vzdělávání, Projekt I Informační gramotnost	2001-2005	1-3
EE	(:)		
CY	(:)		
LV	LIIS (Latvijas izglītības informatizācijas sistēmas izveides projekts)	1997-2004	1-3
LT	Informacijos ir komunikacijos technologijų diegimo švietime strategija	2001-2004	1-3
HU	IKT alapú pedagógiai továbbképzés (Pilot-project for 10 000 teachers)	since 2003	2
MT	(–)		
PL	Intel Teach to the Future	2001-2003	1-3
RO	(–)		
SI	RO (program računalniškega opismenjevanja)	1994-2003	1-3
	Informatizacija šol	2001-2006	1-3
SK	(–)		

Source: Eurydice.

Annexe 5

Tables of data by Figure with standard error

(Figure A1 and A4.) Percentage of pupils (grade 4) who claim they have a computer at home, 2000/01

							UK												
	DE	EL	FR	IT	NL	SE	ENG	SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
Percentage	84.6	55.3	75.7	80.3	92.5	95	84.9	76.5	89.0	92.4	17.7	64.7	60.6	29.1	29.9	58.3	18.7	64.8	45.3
Standard error	*0.6*	*2.0*	*1.0*	*0.9*	*0.5*	*0.5*	*0.8*	*1.2*	*0.5*	*0.6*	*1.1*	*1.4*	*1.2*	*1.2*	*1.4*	*1.3*	*1.4*	*1.2*	*1.4*

Source: IEA, PIRLS 2001 database.

(Figures A2 and A3; C3.) Percentage of 15-year-old pupils who claim to have a computer at home, 1999/2000

	BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
Percentage	76.2	88.1	91.2	87	44.7	67.4	65.8	67.4	69.7	82.9	(:)	88	56.9	81.7	94.6	90.8	85.9	86.3	95.5	88.3	93	31.5	55.2	25.9	51.1	45.1	28.7
Standard error	*1.5*	*0.8*	*0.5*	*0.6*	*1.1*	*1.4*	*0.8*	*1.1*	*0.9*	*0.6*		*0.6*	*1.6*	*0.6*	*0.4*	*0.5*	*0.8*	*0.8*	*0.3*	*1.8*	*0.5*	*1.8*	*1.1*	*1.0*	*1.4*	*1.6*	*1.3*

Source: OECD, PISA 2000 database.

(Figures A2 and A3.) Percentage of 15-year-old pupils who claim to have an Internet connection at home, 1999/2000

	BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
Percentage	38.0	46.2	66.1	40.0	25.0	24.0	27.1	43.0	32.7	50.0	(:)	39.1	24.3	55.2	82.8	59.2	52.6	51.9	80.0	48.7	71.2	26.3	14.7	9.3	12.9	19.0	12.8
Standard error	*1.6*	*1.1*	*1.0*	*1.0*	*1.2*	*1.2*	*0.8*	*1.3*	*0.9*	*0.9*		*0.9*	*1.2*	*0.9*	*0.7*	*0.9*	*1.2*	*1.5*	*0.6*	*2.5*	*1.1*	*1.6*	*0.7*	*0.8*	*0.7*	*1.0*	*0.9*

Source: OECD, PISA 2000 database.

(Figure A4.) Percentage of pupils (grade 4) who have a computer at home and who claim to use it at least once a week, 2000/01

							UK												
	DE	EL	FR	IT	NL	SE	ENG	SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
Percentage	66.1	37.2	59.7	52.7	76.3	75.5	74.5	67.9	68.7	70.3	21.5	49.6	44.1	25.0	29.5	52.8	18.1	57.7	34.0
Standard error	*0.8*	*1.8*	*1.0*	*1.0*	*0.9*	*0.7*	*1.0*	*0.9*	*0.9*	*1.0*	*1.2*	*1.4*	*1.6*	*1.2*	*1.3*	*1.2*	*1.5*	*1.2*	*1.3*

Source: IEA, PIRLS 2001 database.

(Figure A5.) Percentage of pupils (grade 4) who use a computer at least once a week in a place other than the home or school, 2000/01

							UK												
	DE	EL	FR	IT	NL	SE	ENG	SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
Percentage	18.9	25.7	24.2	17.1	24.1	24.6	29.0	34.0	28.3	27.5	32.6	22.1	19.3	20.4	19.2	23.6	16.8	27.5	16.8
Standard error	*0.7*	*1.2*	*0.9*	*0.7*	*0.8*	*0.8*	*1.1*	*1.1*	*0.9*	*1.2*	*1.4*	*1.0*	*1.1*	*1.0*	*1.0*	*1.0*	*1.5*	*1.2*	*0.9*

Source: IEA, PIRLS 2001 database.

(Figure A6.) Percentage of pupils (grade 4) who use the computer at home at least once a week to play, write, search for information or exchange e-mail, 2000/01

Play							UK											
	DE	**EL**	**FR**	**IT**	**NL**	**SE**	**ENG**	**SCT**	**IS**	**NO**	**BG**	**CZ**	**CY**	**LV**	**LT**	**HU**	**RO**	**SI**	**SK**
Every day or almost every day	34.8	27.8	35.7	29.8	44.9	33.9	41.1	43.2	42.4	34.8	35.5	37.3	43.7	28.9	35.6	40.4	31.4	43.4	35.9
Standard error	*0.9*	*1.6*	*1.1*	*1.1*	*1.2*	*0.9*	*1.3*	*1.2*	*0.9*	*1.3*	*1.6*	*1.3*	*1.4*	*1.6*	*1.5*	*1.1*	*2.8*	*1.5*	*1.5*
Once or twice a week	40.8	35.4	35.6	28.8	38.0	42.7	39.1	36.5	36.8	40.8	28.9	38.4	33.5	38.3	36.9	36.8	39.6	36.1	34.2
Standard error	*1.0*	*1.5*	*0.9*	*1.0*	*1.1*	*0.8*	*1.1*	*1.1*	*0.8*	*1.2*	*1.3*	*1.0*	*1.5*	*1.7*	*1.6*	*1.1*	*3.2*	*1.4*	*1.3*
Write							UK											
	DE	**EL**	**FR**	**IT**	**NL**	**SE**	**ENG**	**SCT**	**IS**	**NO**	**BG**	**CZ**	**CY**	**LV**	**LT**	**HU**	**RO**	**SI**	**SK**
Every day or almost every day	11.1	22.8	14.7	17.7	7.1	5.8	10.8	10.7	5.6	5.4	11.2	8.4	14.7	6.8	6.1	5.2	8.8	12.5	8.8
Standard error	*0.6*	*1.5*	*0.8*	*1.0*	*0.6*	*0.4*	*0.7*	*1.0*	*0.4*	*0.5*	*0.9*	*0.6*	*1.1*	*0.7*	*0.7*	*0.5*	*0.9*	*0.9*	*0.7*
Once or twice a week	21.3	29.6	26.4	25.5	19.6	21.8	28.1	30.2	14.9	15.4	17.3	20.9	27.2	16.4	15.0	11.8	22.7	23.6	16.2
Standard error	*0.8*	*1.8*	*1.1*	*0.9*	*0.9*	*1.0*	*1.0*	*1.3*	*0.6*	*0.9*	*1.1*	*1.1*	*1.4*	*1.2*	*1.2*	*0.8*	*2.4*	*1.1*	*0.9*
Information search							UK											
	DE	**EL**	**FR**	**IT**	**NL**	**SE**	**ENG**	**SCT**	**IS**	**NO**	**BG**	**CZ**	**CY**	**LV**	**LT**	**HU**	**RO**	**SI**	**SK**
Every day or almost every day	13.9	18.7	14.6	19.7	13.7	11.6	18.4	18.9	10.0	8.0	15.5	10.9	16.2	9.1	10.5	11.6	10.0	15.2	9.5
Standard error	*0.5*	*1.3*	*0.8*	*1.0*	*0.8*	*0.7*	*1.0*	*1.0*	*0.5*	*0.6*	*1.1*	*0.9*	*1.0*	*1.0*	*1.0*	*0.9*	*1.1*	*1.0*	*0.8*
Once or twice a week	21.0	19.7	20.6	20.7	21.7	24.6	37.1	31.1	19.3	19.7	16.7	16.7	20.3	14.6	17.6	17.6	13.9	16.9	11.9
Standard error	*0.7*	*1.6*	*0.9*	*0.8*	*0.9*	*0.7*	*1.2*	*1.5*	*0.7*	*0.9*	*1.0*	*1.1*	*1.1*	*1.4*	*1.0*	*1.1*	*1.8*	*0.9*	*1.0*
Send and receive electronic mail							UK											
	DE	**EL**	**FR**	**IT**	**NL**	**SE**	**ENG**	**SCT**	**IS**	**NO**	**BG**	**CZ**	**CY**	**LV**	**LT**	**HU**	**RO**	**SI**	**SK**
Every day or almost every day	12.3	11.8	7.4	10.2	10.9	12.7	15.2	14.6	10.7	8.0	11.2	7.6	10.8	5.4	6.7	5.6	7.0	9.0	5.0
Standard error	*0.5*	*0.9*	*0.6*	*0.7*	*0.8*	*0.8*	*0.8*	*0.8*	*0.5*	*0.6*	*0.8*	*0.7*	*0.7*	*0.6*	*0.8*	*0.5*	*0.8*	*0.7*	*0.6*
Once or twice a week	11.5	12.1	8.3	9.0	15.3	19.1	18.0	17.8	14.0	12.3	11.8	9.5	9.0	8.8	8.7	6.5	10.3	9.0	6.9
Standard error	*0.6*	*1.1*	*0.6*	*0.6*	*0.8*	*1.0*	*0.9*	*0.9*	*0.6*	*0.9*	*0.9*	*0.7*	*0.7*	*0.7*	*0.9*	*0.6*	*1.3*	*0.6*	*0.7*

Source: IEA, PIRLS 2001 database.

(Figures C2 et C3.) Average number of pupils per computer in schools attended by pupils aged 15, 1999/2000

	BE fr	**BE nl**														UK										
			DK	**DE**	**EL**	**ES**	**FR**	**IE**	**IT**	**LU**	**NL**	**AT**	**PT**	**FI**	**SE**	**ENG**	**NIR**	**SCT**	**IS**	**LI**	**NO**	**BG**	**CZ**	**LV**	**HU**	**PL**	**RO**
Number of pupils	18.2	10.5	8.4	22.8	57.9	23.7	12.3	15.3	15.3	9.6	(:)	10.1	67.4	9.3	8.9	8.2	6.9	5.5	10.7	7.2	6.5	46.6	19.6	31.5	12.0	28.5	50.8
Standard error	*1.3*	*0.5*	*0.3*	*0.7*	*5.3*	*1.2*	*0.7*	*0.6*	*0.9*	*0.01*		*0.5*	*6.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*	*0.02*	*0.02*	*0.2*	*2.5*	*0.9*	*2.7*	*0.8*	*2.1*	*2.3*

Source: OECD, PISA 2000 database.

(Figure C4.) Average percentage of computers exclusively reserved for the use of teachers in schools attended by pupils aged 15, 1999/2000

	BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
Percentage	10.5	7.2	8.2	9.9	24.4	18.0	8.6	10.3	10.2	9.4	(:)	8.7	27.5	10.7	14.0	10.3	15.4	10.3	14.9	18.9	17.7	13.3	20.3	24.1	10.7	14.3	4.2
Standard error	*1.9*	*1.3*	*0.6*	*1.0*	*2.9*	*1.1*	*1.3*	*1.3*	*1.3*	*0.0*		*1.4*	*2.6*	*0.6*	*0.7*	*0.6*	*1.7*	*1.2*	*0.03*	*0.05*	*1.3*	*2.4*	*1.2*	*3.7*	*0.6*	*1.9*	*0.6*

Average percentage of computers exclusively reserved for the use of administrative staff in schools attended by pupils aged 15, 1999/2000

	BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
Percentage	18.6	14.2	10.4	12.9	33.0	9.0	13.4	8.4	13.0	7.0	(:)	7.3	33.6	8.3	10.1	7.4	6.2	5.6	7.7	7.7	14.2	16.3	15.1	18.8	10.3	13.4	14.8
Standard error	*2.1*	*0.7*	*0.5*	*0.6*	*3.4*	*0.6*	*0.8*	*0.5*	*0.6*	*0.01*		*0.5*	*2.3*	*0.4*	*0.4*	*0.5*	*0.6*	*0.5*	*0.01*	*0.05*	*0.5*	*1.3*	*1.0*	*2.7*	*0.7*	*1.2*	*0.7*

Source: OECD, PISA 2000 database.

(Figure C5.) Average percentage of computers connected to the Internet in schools attended by pupils aged 15, 1999/2000

	BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
Percentage	47.2	42.6	65.0	37.3	26.4	40.7	26.3	46.6	24.1	87.8	(:)	69.3	35.3	83.7	74.3	53.8	30.9	37.8	82.6	78.9	49.8	28.5	39.8	42.4	58.5	35.3	26.7
Standard error	*3.5*	*2.8*	*1.7*	*2.6*	*2.7*	*3.1*	*2.2*	*3.1*	*2.4*	*0.1*		*3.4*	*2.3*	*1.6*	*2.4*	*3.4*	*2.4*	*3.8*	*0.08*	*0.2*	*2.3*	*3.1*	*2.6*	*3.9*	*2.4*	*3.1*	*2.8*

Source: OECD, PISA 2000 database.

(Figure C7.) Average number of pupils per computer in PUBLIC-SECTOR SCHOOLS attended by pupils aged 15, 1999/2000

	BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
Number of pupils	16.4	7.5	8.5	22.8	61.6	21.0	12.2	13.0	15.6	9.8	(:)	10.0	64.8	9.1	8.8	8.3	6.9	5.6	10.7	7.4	6.6	46.9	20.2	33.0	12.1	29.1	51.4
Standard error	*1.9*	*0.7*	*0.4*	*0.8*	*5.7*	*1.3*	*0.8*	*0.9*	*0.9*	*0.0*		*0.6*	*5.9*	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*	*0.02*	*0.02*	*0.2*	*2.5*	*1.0*	*3.0*	*0.9*	*2.2*	*2.4*

Source: OECD, PISA 2000 database.

(Figure C7.) Average number of pupils per computer in PRIVATE SCHOOLS attended by pupils aged 15, 1999/2000

	BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
Number of pupils	18.2	11.5	7.8	20.7	13.5	27.0	12.2	16.6	10.4	8.0	(:)	10.6	109.7	15.3	12.3	6.9	6.8	3.5	8.7	3.1	2.9	4.6	11.2	14.7	10.1	10	14.5
Standard error	*1.5*	*0.6*	*0.7*	*4.2*	*3.2*	*2.3*	*1.9*	*0.7*	*3.7*	*0.0*		*1.6*	*40.2*	*3.3*	*4.2*	*0.9*	*0.0*	*1.3*	*0.3*	*0.0*	*1.6*	*0.0*	*2.0*	*0.0*	*1.4*	*2.5*	*10.4*

Source: OECD, PISA 2000 database.

(Figure C8.) Correlation between the student/computer ratio and the size of schools attended by pupils aged 15, 1999/2000

	BE fr	BE nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK ENG	UK NIR	UK SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
Ratio	0.44	0.29	0.52	0.29	0.20	0.25	0.03	0.37	0.11	0.61	(:)	0.07	0.36	0.40	0.14	0.19	0.54	0.26	0.58	0.75	0.63	0.44	0.26	0.41	0.31	0.73	0.29
Standard error	*0.13*	*0.10*	*0.06*	*0.08*	*0.11*	*0.09*	*0.09*	*0.06*	*0.12*	*0.00*		*0.08*	*0.07*	*0.06*	*0.08*	*0.07*	*0.04*	*0.14*	*0.00*	*0.00*	*0.05*	*0.09*	*0.09*	*0.11*	*0.07*	*0.05*	*0.08*

Source: OECD, PISA 2000 database.

(Figure C9.) Percentages of pupils who attend a class with access to at least one computer located in or away from the class (grade 4), 2000/01

							UK												
	DE	EL	FR	IT	NL	SE	ENG	SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
Computer in the class	47.6	0.5	41.6	6.0	90.0	88.9	87.8	96.2	62.9	58.8	0.0	12.3	7.5	3.6	2.1	3.9	1.1	7.8	0.0
Standard error	*3.9*	*0.3*	*4.7*	*1.8*	*2.8*	*2.6*	*3.2*	*1.7*	*0.4*	*4.1*	0.0	*2.8*	*2.8*	*1.4*	*1.0*	*1.5*	*0.6*	*2.2*	0.0
Computer away from the class	53.8	17.0	78.0	60.7	92.9	90.9	95.2	81.7	90.2	83.5	18.2	60.1	29.1	34.6	22.3	37.5	21.7	66.4	15.3
Standard error	*3.5*	*3.3*	*4.3*	*3.1*	*3.2*	*2.0*	*2.1*	*4.3*	*0.2*	*3.2*	*3.0*	*4.0*	*4.5*	*3.9*	*3.7*	*4.6*	*3.4*	*4.0*	*2.9*

Source: IEA, PIRLS 2001 database.

(Figure E1.) Distribution of 15-year-old pupils according to their frequency of use of computers in schools, 1999/2000

	BE	BE														UK										
	fr	nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	ENG	NIR	SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
Never or hardly ever	40.3	18.9	1.7	38.5	32.9	41.2	37.5	34.8	26.8	23.4	(:)	15.7	31.1	6.4	10.2	8.0	15.6	15.3	10.0	12.5	11.4	9.6	33.0	31.0	15.3	28.6	30.8
Standard error	*2.9*	*28.3*	*0.2*	*1.4*	*1.6*	*1.6*	*1.4*	*1.6*	*1.8*	*0.7*		*1.1*	*1.5*	*0.8*	*0.9*	*0.7*	*0.7*	*0.7*	*0.5*	*1.9*	*1.1*	*1.2*	*1.9*	*1.8*	*1.5*	*2.2*	*1.1*
A few times a year	18.9	10.9	6.7	19.9	16.7	14.9	22.4	16.3	11.2	13.5	(:)	8.4	21.3	14.9	12.8	12.7	16.7	13.5	13.0	16.9	22.2	5.4	12.7	13.1	6.4	6.9	6.3
Standard error	*1.5*	*15.6*	*0.8*	*0.9*	*0.6*	*0.9*	*0.8*	*0.8*	*0.7*	*0.6*		*0.5*	*0.8*	*1.0*	*0.8*	*0.7*	*0.7*	*0.7*	*0.5*	*2.0*	*1.2*	*0.4*	*0.8*	*0.8*	*0.6*	*0.6*	*0.5*
About once a month	10.2	5.3	11.1	9.1	11.2	6.4	16.3	6.4	7.5	10.7	(:)	7.6	13.5	13.4	16.5	14.3	12.5	11.5	10.0	12.7	21.8	7.5	6.6	9.4	4.4	6.4	6.3
Standard error	*0.9*	*11.9*	*0.8*	*0.6*	*0.6*	*0.5*	*0.6*	*0.5*	*0.6*	*0.6*		*0.5*	*0.6*	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*0.5*	*1.8*	*0.8*	*0.5*	*0.5*	*0.6*	*0.4*	*0.5*	*0.5*
Several times a month	14.5	40.1	36.8	20.1	22.1	12.1	14.5	24.2	19.4	30.6	(:)	27.0	17.2	41.7	27.8	27.5	21.1	20.2	32.7	37.7	26.2	25.2	28.0	26.8	32.1	30.3	22.0
Standard error	*1.4*	*20.6*	*1.1*	*0.9*	*1.1*	*0.9*	*0.8*	*1.5*	*1.1*	*0.8*		*0.9*	*0.8*	*1.2*	*0.9*	*1.0*	*1.0*	*1.0*	*0.8*	*2.6*	*1.4*	*1.1*	*1.4*	*1.2*	*1.4*	*1.7*	*0.8*
Several times a week	16.0	24.7	43.7	12.5	17.1	25.4	9.3	18.2	35.0	21.9	(:)	41.4	17.0	23.5	32.8	37.5	34.1	39.5	34.3	20.3	18.4	52.3	19.7	19.7	41.7	27.7	34.6
Standard error	*1.4*	*23.6*	*1.5*	*0.7*	*0.9*	*1.3*	*0.6*	*1.1*	*1.8*	*0.6*		*1.3*	*0.8*	*1.1*	*1.6*	*1.3*	*1.3*	*1.3*	*0.8*	*2.3*	*1.4*	*1.7*	*1.2*	*1.1*	*1.7*	*1.6*	*1.2*

Source: OECD, PISA 2000 database.

(Figure E2.) Distribution of 15-year-old pupils according to the frequency of use of Internet in schools, 1999/2000

	BE	BE														UK										
	fr	nl	DK	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	ENG	NIR	SCT	IS	LI	NO	BG	CZ	LV	HU	PL	RO
Never or hardly ever	51.4	58.5	3.6	62.8	57.6	69.9	62.2	69.0	74.9	31.8	(:)	25.8	45.7	9.5	12.7	38.3	58.0	49.2	16.7	16.1	17.2	56.0	65.5	71.7	36.5	67.9	56.3
Standard error	*3.0*	*46.7*	*0.8*	*1.7*	*1.5*	*2.2*	*1.8*	*1.7*	*2.1*	*0.9*		*1.5*	*1.7*	*1.0*	*1.3*	*2.0*	*2.0*	*2.0*	*0.6*	*2.0*	*1.8*	*2.0*	*2.3*	*1.7*	*2.2*	*2.7*	*1.5*
A few times a year	16.2	18.5	7.2	14.7	13.7	10.4	14.4	10.7	8.2	13.5	(:)	8.7	17.1	14.5	11.6	12.3	13.9	13.5	14.6	15.8	20.6	7.2	7.2	9.9	10.6	7.4	7.1
Standard error	*1.0*	*10.4*	*0.7*	*0.8*	*0.7*	*0.9*	*0.8*	*0.8*	*0.6*	*0.6*		*0.6*	*0.6*	*0.9*	*0.8*	*0.6*	*0.6*	*0.6*	*0.6*	*1.8*	*1.1*	*0.5*	*0.7*	*0.7*	*0.7*	*0.6*	*0.4*
About once a month	9.9	8.2	12.0	8.3	8.5	6.0	9.5	6.9	5.4	13.8	(:)	11.0	11.5	14.2	16.1	12.9	11.1	11.1	12.6	15.3	19.6	7.7	5.4	6.3	10.7	5.5	8.0
Standard error	*1.0*	*9.9*	*0.7*	*0.6*	*0.6*	*0.5*	*0.7*	*0.6*	*0.6*	*0.7*		*0.7*	*0.6*	*0.6*	*0.7*	*0.8*	*0.8*	*0.8*	*0.6*	*2.0*	*0.9*	*0.5*	*0.5*	*0.5*	*0.6*	*0.8*	*0.6*
Several times a month	12.5	9.8	33.3	8.7	10.2	6.7	8.1	8.3	6.0	24.3	(:)	23.6	13.7	39.4	25.4	16.7	8.5	13.6	29.1	35.1	25.0	11.2	12.9	6.0	25.3	11.0	12.7
Standard error	*1.3*	*16.0*	*1.0*	*0.7*	*0.7*	*0.6*	*0.7*	*0.8*	*0.7*	*0.8*		*1.1*	*0.8*	*1.2*	*0.9*	*0.8*	*0.8*	*0.8*	*0.8*	*2.4*	*1.5*	*0.8*	*1.0*	*0.7*	*1.4*	*1.6*	*0.7*
Several times a week	10.1	4.9	43.9	5.4	9.9	6.9	5.8	5.1	5.6	16.5	(:)	30.9	11.9	22.4	34.2	19.8	8.4	12.6	27.2	17.7	17.6	17.9	8.9	6.1	16.9	8.2	16.0
Standard error	*1.2*	*17.0*	*1.6*	*0.4*	*0.6*	*1.1*	*0.6*	*0.6*	*0.8*	*0.6*		*1.3*	*0.8*	*1.2*	*1.7*	*1.1*	*1.1*	*1.1*	*0.8*	*2.1*	*1.4*	*1.3*	*0.9*	*0.7*	*1.2*	*1.1*	*1.0*

Source: OECD, PISA 2000 database.

(Figure E3.) Frequency of computer use by grade 4 pupils in schools, 2000/01

							UK												
	DE	EL	FR	IT	NL	SE	ENG	SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
Every day	2.9	3.5	6.2	2.9	11.8	4.5	5.2	11.8	4.5	3.2	3.9	4.2	5.7	3.1	2.0	1.9	5.8	3.6	1.8
Standard error	*0.4*	*0.5*	*0.8*	*0.6*	*1.4*	*0.6*	*0.9*	*1.4*	*0.4*	*0.6*	*0.5*	*0.8*	*0.7*	*0.7*	*0.5*	*0.4*	*2.1*	*0.6*	*0.5*
Once or twice a week	17.8	17.3	34.1	30.4	41.3	32.0	63.6	54.7	60.6	20.7	14.0	20.0	20.5	27.5	10.8	34.3	26.5	17.0	6.4
Standard error	*1.5*	*3.3*	*2.5*	*2.9*	*2.6*	*1.8*	*2.7*	*2.5*	*0.8*	*2.1*	*2.2*	*2.0*	*2.4*	*3.4*	*2.2*	*3.5*	*4.3*	*1.7*	*1.3*
Once or twice a month	17.6	4.7	23.9	15.0	22.9	39.0	24.1	24.3	17.4	31.2	5.2	17.3	13.3	11.4	8.6	6.0	6.6	20.6	5.7
Standard error	*1.3*	*1.1*	*1.6*	*1.5*	*1.4*	*1.4*	*2.1*	*2.1*	*0.6*	*2.0*	*1.1*	*2.0*	*2.1*	*1.1*	*1.7*	*0.9*	*1.6*	*2.0*	*1.4*
Never or almost never	61.7	74.5	35.8	51.7	24.0	24.5	7.0	9.2	17.6	44.9	76.9	58.5	60.6	58.0	78.7	57.8	61.0	58.8	86.2
Standard error	*2.3*	*3.6*	*3.3*	*3.1*	*2.5*	*1.5*	*1.1*	*1.3*	*0.6*	*3.2*	*2.7*	*3.0*	*3.3*	*3.4*	*3.2*	*3.8*	*4.4*	*2.5*	*2.4*

Source: IEA, PIRLS 2001 database.

(Figure E4.) Proportion of grade 4 pupils using computers at least once a week to search for information, write and read texts, develop reading strategies and communicate at school, 2000/01

Search for information							UK												
	DE	EL	FR	IT	NL	SE	ENG	SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
Every day or almost every day	3.5	0.0	2.9	1.9	3.0	12.1	4.3	11.2	1.9	1.4	2.6	2.3	0.0	4.2	0.0	0.0	0.0	2.0	0.0
Standard error	*1.5*	*0.0*	*1.7*	*1.3*	*1.6*	*2.4*	*1.5*	*3.5*	*0.1*	*0.8*	*2.5*	*1.7*	*0.0*	*3.0*	*0.0*	*0.0*	*0.0*	*1.4*	*0.0*
Once or twice a week	11.9	26.2	17.6	12.0	12.4	30.9	43.5	31.1	13.6	9.1	2.7	13.3	16.1	10.1	9.9	2.2	19.1	7.2	10.6
Standard error	*4.1*	*16.2*	*3.4*	*3.3*	*3.2*	*3.8*	*4.9*	*4.9*	*0.3*	*2.7*	*2.6*	*3.4*	*7.8*	*4.0*	*5.2*	*1.6*	*7.5*	*2.6*	*6.8*
Writing							UK												
	DE	EL	FR	IT	NL	SE	ENG	SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
Every day or almost every day	4.8	0.0	2.6	1.8	3.6	11.7	8.1	3.3	1.2	0.6	0.0	0.0	1.3	2.5	2.8	0.0	6.1	2.4	0.0
Standard error	*1.8*	*0.0*	*1.2*	*1.3*	*1.6*	*2.5*	*2.5*	*1.7*	*0.1*	*0.5*	*0.0*	*0.0*	*1.3*	*2.5*	*2.7*	*0.0*	*6.2*	*1.7*	*0.0*
Once or twice a week	17.1	16.8	26.8	19.2	12.6	35.6	32.6	28.5	24.7	14.4	9.7	5.6	22.4	11.1	6.3	5.7	20.0	6.8	7.8
Standard error	*3.4*	*11.0*	*4.3*	*3.8*	*2.3*	*3.1*	*4.3*	*4.0*	*0.4*	*3.2*	*5.2*	*2.1*	*8.6*	*4.9*	*4.3*	*2.9*	*8.4*	*2.6*	*5.5*
Reading							UK												
	DE	EL	FR	IT	NL	SE	ENG	SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
Every day or almost every day	2.9	0.0	0.9	0.0	1.4	3.1	0.0	2.3	1.9	0.1	0.0	0.0	1.3	0.0	0.0	0.0	0.0	1.0	0.0
Standard error	*1.8*	*0.0*	*0.7*	*0.0*	*1.0*	*1.0*	*0.0*	*1.4*	*0.1*	*0.1*	*0.0*	*0.0*	*1.3*	*0.0*	*0.0*	*0.0*	*0.0*	*1.0*	*0.0*
Once or twice a week	17.9	7.7	8.5	10.1	4.5	16.8	21.7	19.6	11.3	5.7	12.3	6.8	11.8	4.3	10.3	2.6	24.1	3.1	11.6
Standard error	*3.6*	*5.4*	*2.1*	*3.1*	*1.9*	*1.9*	*4.0*	*4.0*	*0.2*	*2.0*	*5.6*	*2.9*	*7.2*	*3.1*	*5.4*	*1.7*	*8.3*	*1.9*	*7.1*
Development of reading strategies							UK												
	DE	EL	FR	IT	NL	SE	ENG	SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
Every day or almost every day	5.8	0.0	0.7	0.9	5.2	3.4	1.6	1.8	0.0	2.4	0.0	0.0	1.3	2.3	0.0	0.7	0.0	1.0	0.0
Standard error	*2.4*	*0.0*	*0.5*	*0.9*	*2.0*	*1.2*	*1.2*	*1.2*	*0.0*	*1.2*	*0.0*	*0.0*	*1.3*	*2.3*	*0.0*	*0.7*	*0.0*	*1.0*	*0.0*
Once or twice a week	20.6	4.6	13.9	11.7	10.8	15.8	16.9	12.6	16.6	16.6	9.8	5.2	2.7	8.1	6.2	0.4	13.1	3.5	1.9
Standard error	*3.5*	*4.4*	*2.7*	*3.0*	*3.0*	*2.1*	*3.4*	*3.0*	*0.2*	*3.8*	*5.4*	*2.4*	*1.6*	*3.4*	*4.2*	*0.4*	*7.2*	*2.1*	*1.8*
Communication							UK												
	DE	EL	FR	IT	NL	SE	ENG	SCT	IS	NO	BG	CZ	CY	LV	LT	HU	RO	SI	SK
Every day or almost every day	0.9	0.0	0.4	0.9	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Standard error	*0.9*	*0.0*	*0.4*	*0.9*	*0.0*	*0.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Once or twice a week	1.9	0.0	7.6	5.4	0.0	5.3	0.0	1.3	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	8.5	1.0	1.9
Standard error	*1.1*	*0.0*	*2.6*	*2.5*	*0.0*	*1.6*	*0.0*	*1.1*	*0.1*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*5.7*	*1.0*	*1.8*

Source: IEA, PIRLS 2001 database.

THEMATIC INDEX OF FIGURES

Computer access	Internet connection	Pupil activity	Specialist teacher
Curriculum	Investment policy	School equipment	Teacher education
Decision-making authority	Number of pupils per computer	School subject	Teaching objective
Frequency of use	Primary education level	Secondary education level	Teaching time
Home equipment	Private education	Skills to be developed	Type of use

Frequency of use

Home equipment

Internet connection

Investment policy

Number of pupils per computer

Primary education level

Private education

Pupil activity

School equipment

School subject

Secondary education level

Skills to be developed

Specialist teacher

Teacher education

Teaching objective

Teaching time

Type of use

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EN

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