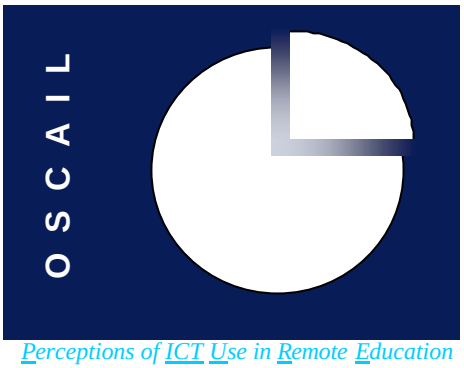

Perceptions of ICT Use in Remote Education

The Digital Divide in the EU:

National Policies and Access to ICTs in the Member States

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www.oscail.ie/picture.htm

Introduction

The meeting of the European Council in Lisbon, March 2000, marked a new departure by European heads of state when they set out their vision that Europe would become "the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion"(European Commission, 2001b) was to be reached within a ten-year period. The adaptation of education and training systems to meet this challenge is viewed as a vital element in the reaching of this goal, and thus was placed at the top of the political agenda. The eEurope action plan (eEurope, 2000a) placed much importance on technology supported learning (eLearning) as the use of information and communication technologies (ICTs) within education could be used as a catalyst for change through providing an opening for increased effectiveness, convenience, diversity and quality. The 'eLearning: Designing tomorrow's education' initiative (European Commission, 2001a) is a part of the eEurope action plan and was adopted on 24 May 2000 by the European Commission. The eLearning initiative has three main aims:

- To accelerate the deployment in the EU of a high quality infrastructure at a reasonable cost
- To step up the training drive at all levels by promoting universal digital literacy and the availability of training as well as courses on the educational use of technology and management of change for teachers and trainers
- To strengthen cooperation and dialogue and improve links between measures and initiatives at all levels and to continue the establishment of public/private partnerships. (European Commission, 2001c)

This initiative fuelled the development of a wave of initiatives, programmes and projects, which have been and are being implemented to date at a national and international level throughout the European Union. One such programme is the PICTURE project. The origins of the PICTURE project lie in the efforts made by the staff of OSCAIL, the National Distance Education Centre for Ireland, to introduce online support for students on its programmes. To date, OSCAIL has utilised mainly 'second generation' distance teaching methods, the main elements of which are specially written self-instructional course texts supported by tutorials in local study centres.

In using ICTs in its programmes, Oscail's pedagogical approach has been attuned to the needs and preferences of students with regard to access and abilities to use ICTs. However, with increasing access to ICTs it is now feasible to envisage a move to third and even fourth generation technologies in the delivery of programmes. The introduction of online support for distance education students gives rise to a number of practical and research issues. Funding was obtained under the EU Socrates/Minerva programme to investigate a number of these issues under the project title PICTURE (**P**erception of **ICT U**se in **R**emote **E**ducation). The project partners are Oscail, Queens University Belfast, and the Danish Association of Open Universities. The following issues are to be investigated within the PICTURE project:

- Access to ICTs
- Level of student ICT expertise
- Student attitudes and expectations of using ICT
- Use and exploitation of online resources developed by commercial publishers
- The online teaching of higher order teaching skills
- Tutor input in online tutoring (Fox and Mac Keogh, 2001).

This report outlines the findings of the investigation into the levels of ICT access within Europe.

Rapid advances in ICTs have resulted in new and faster ways of storing, handling, distributing and accessing information. With the subsequent substantial reductions in their cost resulting in their being more widely accessible, these new technologies can break down barriers to knowledge and participation (UNDP, 2001). A result of these advancements has been the evolution of utopian scenarios focusing exclusively on the positive elements of the

emergence of an information revolution, age or society. Casting a shadow over this is the realisation that ICTs are spatially biased, tend to underpin new and old geographic divisions and hierarchies, and can contribute to new patterns of homogenisation and differentiation (Robins and Gillespie, 1992).

This 'digital divide' can be 'between individuals, households, businesses and geographic areas at different socio-economic levels with regard to both their opportunities' and ability 'to access ICTs and to their use of the Internet for a wide variety of activities' (OECD, 2001). Spatial disparities in the availability of high-speed connections are also shaping the divide as those unable to tap into the full capabilities of the Internet, at an adequate speed, are also at a disadvantage. This study is a comparative analysis of each of the fifteen EU member states with respect to differential access to ICTs and quality of connections, both generally and within the education systems, and the various national policies for implementing the Information Society.

Each country profile begins with an outline of the socio-economic background, then a description of access to a number of technologies such as the number of PCs and Internet connections both generally and within the education systems. Other indicators are examined including the number of public Internet access points (PIAPs), the number of technology and science graduates, and the amount of European Computer Driving Licence (ECDL) skill cards which were issued. The ICT policy context is also described for each country. These include the regulation of the telecommunications market, the provision of technology to the education system and the implementation of information society initiatives. The first section of the report takes all of these considerations into account in performing a comparative analysis of the EU member states.

The analysis reveals that there is a definite pattern evident throughout the EU member states where differential access to and use of ICTs is concerned. This pattern generally reflects the extent of information society initiatives that have been implemented. Those states which led the way in this area tend to perform better for all of the indicators investigated. This, however, does not go far enough in explaining the levels of differential access between the states as the time period between their implementing their first information society initiatives is not substantial. The socio-economic background, level of each country's telecommunications infrastructure and how radical and thorough the provision of these services are, is suggested as a further reason for these differences. As a result of this, it is suggested that there are different types of digital divides within the EU. These take the form of the more commonly documented divides such as gender, language and urban/rural within and between each of the countries. However, general divisions between the countries also exist. These are in the form of a north-south and a tripartite division. These will be examined and the implications, both generally and for eLearning and distance education, will be discussed.

Much of the data was obtained through public information sources via the Internet. The European Commission and the Information Society Promotion Office produced the more general reports concerning Europe and information society indicators. These included eEurope publications and specific sections of surveys such as the Eurobarometer survey. Statistics from the International Telecommunication Union and United Nations Development Programme (UNDP) reports proved useful while Eurostat publications both online and printed made up the majority of statistics used. The more specific statistics, such as those concerned with education, were obtained through sources such as Eurydice (The Information Network on Education in Europe) and the European Association of Distance Teaching Universities (EADTU). Some information, such as the number of ECDL skill cards issued in each country and figures on distance learning for both Greece and Italy was obtained through personal correspondence from people involved in their development.

To ensure comparability, only statistics available for all of the fifteen member states, compiled at the same time, were drawn upon. This was the case for the socio-economic and access to technology indicators. These could then be brought into play for the individual country profiles resulting in the compilation of an identical analysis for each member state. Similarly, the majority of information gathered in relation to the policy context section

contained information on all of the countries of interest. Through an individual analysis of both the indicators and policies for each country any patterns or trends present could be revealed. For each of the access to technology indicators the countries were ranked to illustrate their performance in relation to each other. When differences in the policy contexts were examined in the light of these findings, the dimensions of the European digital divide came to light. Inevitably, some of the technology indicators are already out of date, however the comparative perspective remains valid.

Comparative Analysis

Introduction

This section summarises the comparisons between the fifteen member states in terms of technology access and policy regimes. The detailed figures for each country are provided in a series of country profiles following this analysis.

Access to Mobile Phones - 2000

The number of mobile phone subscriptions per 100 inhabitants in the EU in 2000 was 63.5. The five leaders are Luxembourg (87.2), Austria (77.2), Italy (73.2), the UK (72.9) and Finland (72.1), however the variation between member states is not substantial.

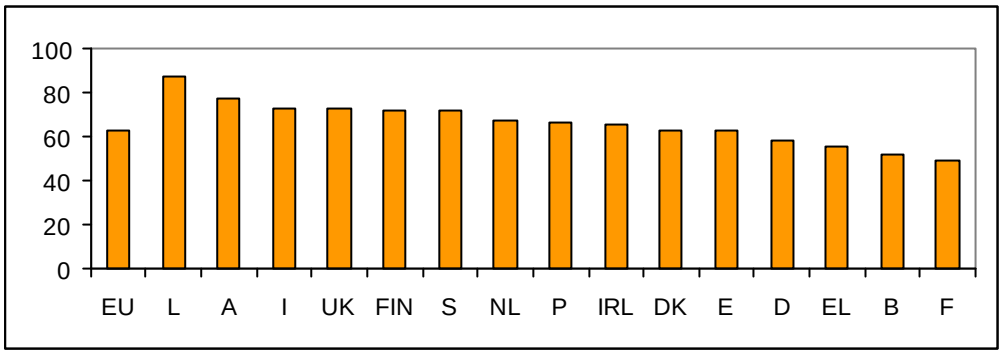


Figure 1: Mobile phone subscriptions per 100 inhabitants, 2000: Source: Eurostat, 2002

Number of PCs - 2000

In 2000, only three countries had over 50% access to PCs. The highest, at 61%, was Denmark followed by Luxembourg (52%) and then Sweden (51%). All of the remaining member states had a total PC rate of above 30% with the exception of Portugal (22%), Italy (20%), Ireland (18%), Spain (15%) and Greece (11%). There is a higher percentage of PCs in homes over businesses among all of the top ten countries with the exception of the UK. Of the bottom five countries Ireland is the only one which does not have a greater number of PCs in businesses than those in homes.

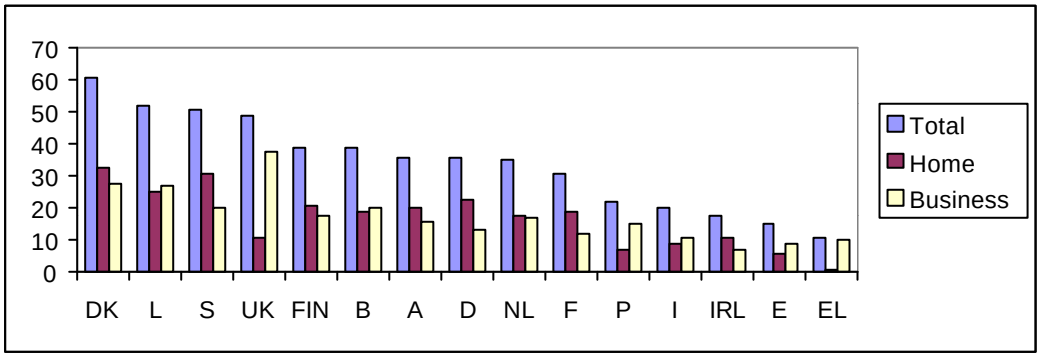
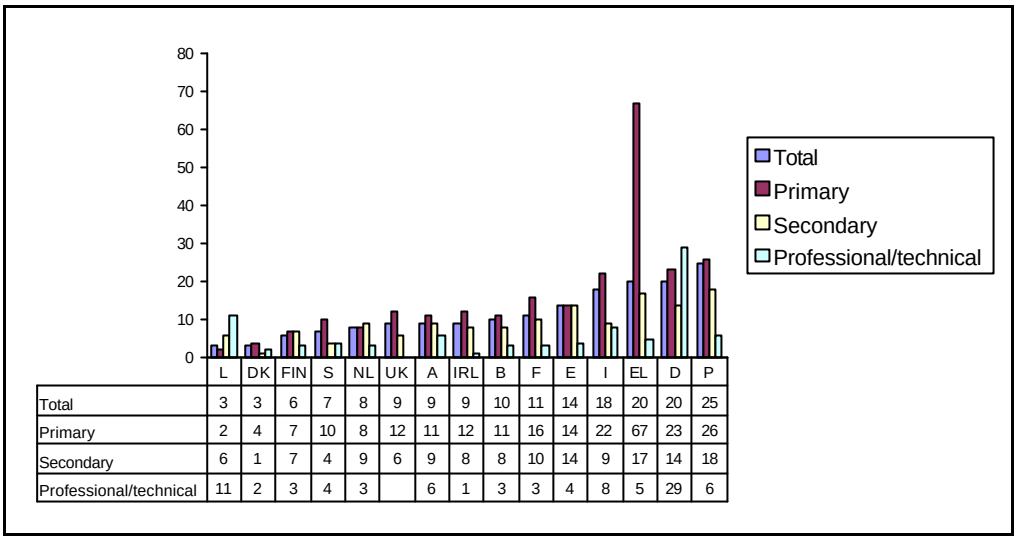


Figure 2: Number of PCs per 100 inhabitants, 2000: Source: ESIS, 2000a

Access to PCs among the student population is similar to the overall distribution when the countries are ranked according to the number of students to a computer. The same general ranking order becomes evident with only a few changes. The countries with the least number of students in total per computer are Luxembourg and Denmark (3), Finland (6), Sweden (7) and the Netherlands (8). Belgium (10) and Germany (20) fall into the bottom half while Ireland (9) moves up into eighth place. All of the countries exhibit similar levels between the levels of education with the exception of Greece which has a highly disproportionate number of students per PC (67) in primary education.



	L	DK	FIN	S	NL	UK	A	IRL	B	F	E	I	EL	D	P
Total	3	3	6	7	8	9	9	9	10	11	14	18	20	20	25
Primary	2	4	7	10	8	12	11	12	11	16	14	22	67	23	26
Secondary	6	1	7	4	9	6	9	8	8	10	14	9	17	14	18
Professional/technical	11	2	3	4	3		6	1	3	3	4	8	5	29	6

Figure 3: Pupils per PC, 2000: Source: eEurope, 2002a, Eurydice, 2001b

Internet Access

There is great variance in the number of people who use the Internet within the member states. Only three countries had over forty percent of their population using it. These were Sweden (44%), Finland (42%) and Denmark (41%). In five countries between 20% and 40% used the Internet (The Netherlands (39%), Luxembourg (24%), Austria and the UK (23%), and Germany (20%)). Of the remaining member states, only three had Internet usage of less than 10% (Spain (10%), Portugal (9%) and Greece (7%)).

As would be expected, there was a higher rate of Internet penetration within companies than in households for all of the countries. Generally, the order in which the countries are ranked for the level of access in different locations followed the same pattern as for the total population Internet usage. There are some exceptions to this but they are only slight. The Netherlands (46%) and Denmark (45%) ranked higher than Finland (28%) for home Internet access. The UK (24%) had a slightly higher rate of home access than Luxembourg (27%) and Austria (17%) while Italy (19%) was slightly higher than Germany (14%). France, Ireland and Belgium reverse the order in which they are placed as Belgium (20%) ranks higher than Ireland (17%) while France (13%) falls behind both.

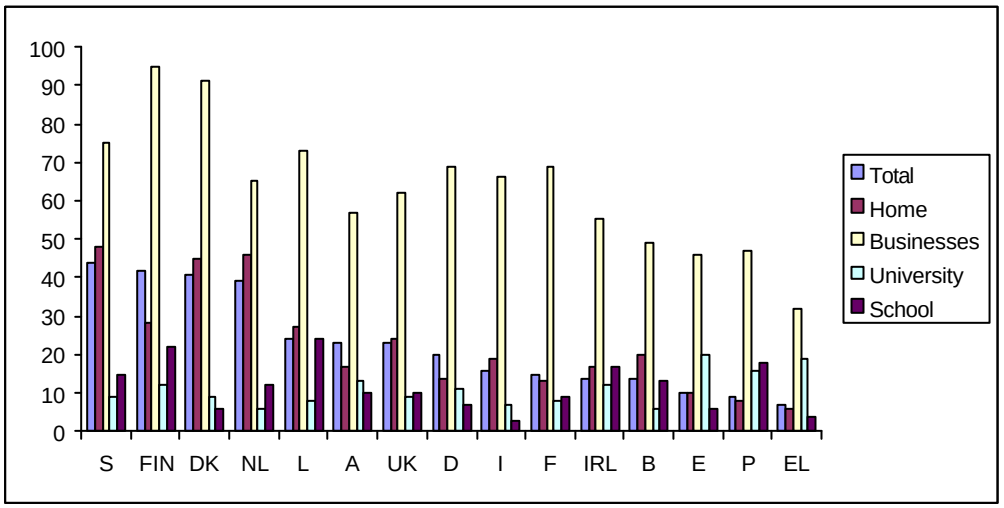
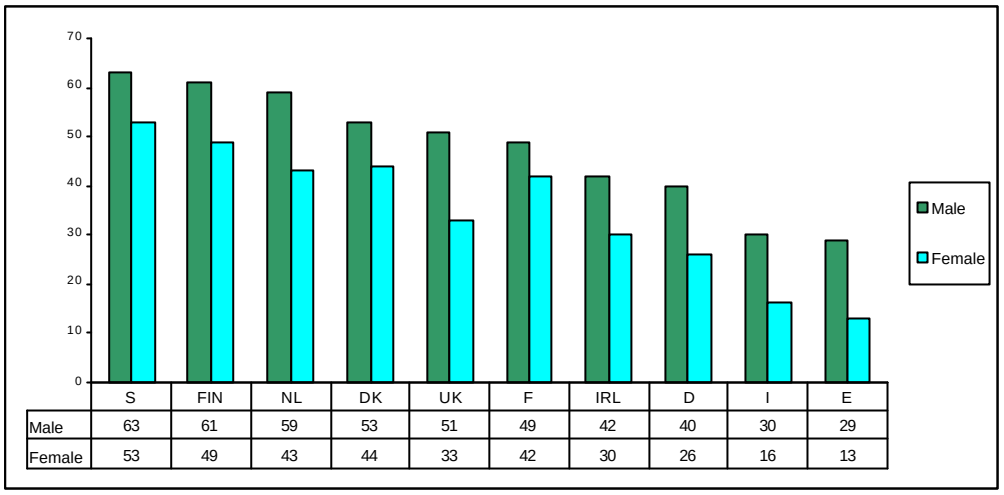


Figure 4: Total population with Internet access and location (%), 2000: Source: Hobley, 2001

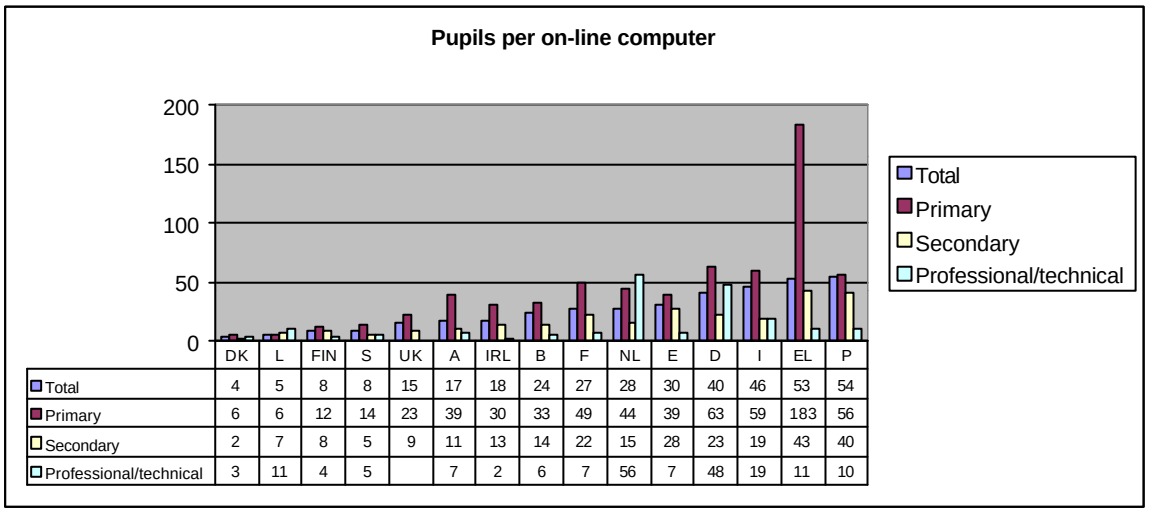
Overall, there are a greater number of males using the Internet throughout all of the countries than there are females. Sweden, Finland and the Netherlands have the highest percentage of both sexes to use the Internet while Germany, Italy and Spain lag behind.



	S	FIN	NL	DK	UK	F	IRL	D	I	E
Male	63	61	59	53	51	49	42	40	30	29
Female	53	49	43	44	33	42	30	26	16	13

Figure 5: Males/females using the Internet (%), 2000: Source: Hobley, 2001

There is a large difference in the number of students per online computer between each of the member states. Analysis of the total number of students, regardless of the level of education, reveals that between the top and bottom states there can be up to fifty more students per online computer. Only four states, Denmark (4), Luxembourg (5), Finland and Sweden (8) have less than ten students per online computer. The UK, Austria and Ireland have between fifteen and twenty while the remaining states, which includes the Netherlands (28), all have over twenty five. There are over forty students per online computer in all of the bottom four states in this category. These are Germany (40), Italy (46), Greece (53) and Portugal (54).



	DK	L	FIN	S	UK	A	IRL	B	F	NL	E	D	I	EL	P
Total	4	5	8	8	15	17	18	24	27	28	30	40	46	53	54
Primary	6	6	12	14	23	39	30	33	49	44	39	63	59	183	56
Secondary	2	7	8	5	9	11	13	14	22	15	28	23	19	43	40
Professional/technical	3	11	4	5		7	2	6	7	56	7	48	19	11	10

Figure 6: Pupils per online computer, 2001: Source: eEurope, 2002a, Eurydice, 2001b

With a few exceptions, throughout the states there is a decrease in the number of students per online computer as they move up through the levels of education. Most of the exceptions are only slight such as Denmark, which only has an increase of one between secondary and professional/technical. There are, however, some much larger increases namely Luxembourg with an increase of four, Germany with an increase of twenty-five, and the Netherlands with an increase of forty-one. As with the number of students per PC at primary level, Greece (183) has a disproportionate number of students per online computer in relation to the other member states.

Other Indicators of Technology Access

A measure of how technologically developed the education system is, and thus the availability of an advanced and well-developed infrastructure, can be obtained through an investigation of the type of connections used by schools to connect to the Internet. The highest number of standard dial-up connections can be found in Greece and Ireland (59%), Luxembourg (54%), France (46%), and Spain (38%) while the lowest numbers are in Germany (22%), Finland (13%), and Denmark (10%). The highest number of ISDN lines are in Germany (93%), the UK (83%) and Belgium (76%) while the lowest are in Ireland (50%), Finland (38%) and Denmark (26%). The largest numbers of ISDN lines are in Finland (51%), Denmark (46%) and Sweden (18%) with the least being in Germany (1%), Greece and Ireland (O%). Cable modem connections are greater in the Netherlands (25%), Denmark (17%) and Belgium (14%). The least number of these connections are in Finland (1%), Luxembourg and Ireland (0%). The reasons for this variance between the states in relation to the type and thus speed of its connections used in schools are revealed in the analysis of policies undertaken below.

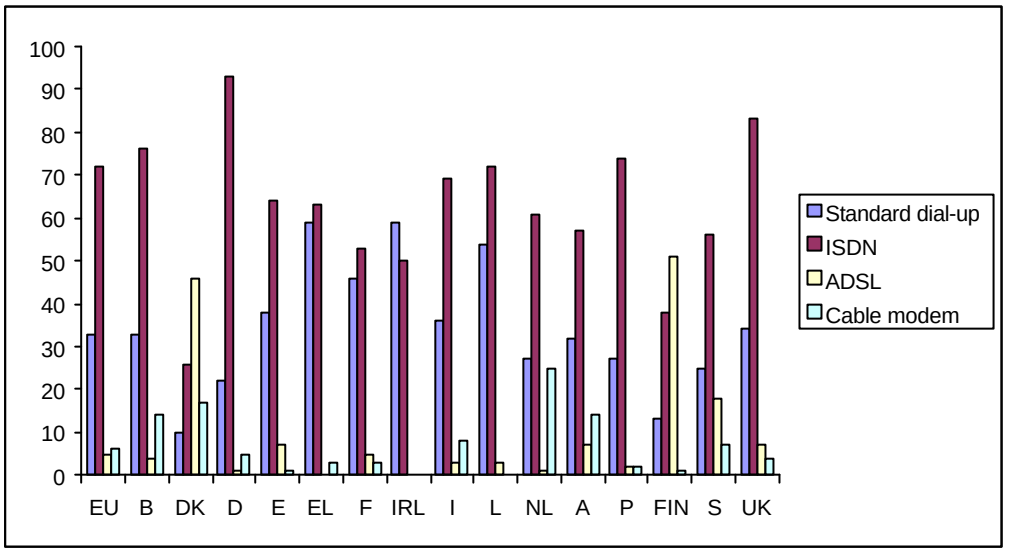


Figure 7: Types of Internet connections in EU schools: Source: eEurope, 2002a

The total number of graduates in science and technology as a percentage of twenty to twenty-four year olds ranges from 5.3% to 1.2%. Finland has the highest percentage 5.3%) with the UK, France and Ireland all above 4%. Germany, Belgium, Sweden, Denmark, the Netherlands and Spain, make up the middle grouping, between 2.4% and 3.2%, while Portugal, Austria and Italy have the lowest number of graduates all having less than 1.5%.

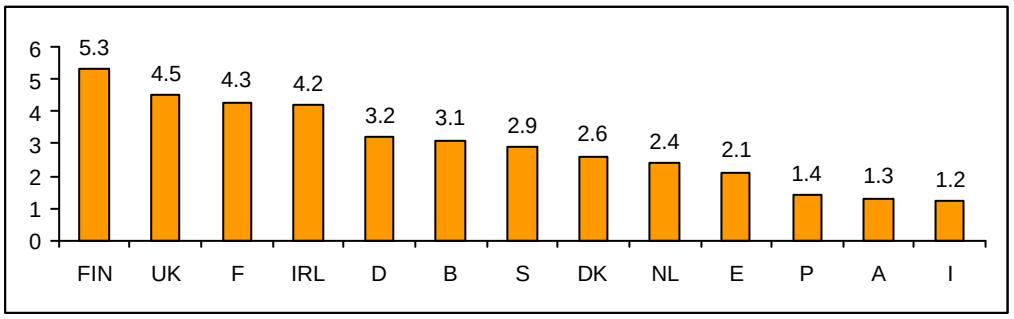


Figure 8: Total graduates in science and technology as % of 20-24 year oldSource, ESDIS, 2001

Figures for the number of public Internet access points (PIAPs) are not available for all of the member states. A dominance of the Northern European countries is evident among the top

ranking countries for which figures are available. Finland has more than three times the number of PIAPs over the second and third place states. Ireland is ranked second, ahead of Denmark and Sweden in this respect. In comparison to these states, Belgium, the Netherlands and Germany have around half the number of PIAPs. With 0.3:1000 points, France and the UK have half the number of these again. The number of PIAPs available to citizens within the member states is a good measure of how accessible the Internet is to the general public whether it is for recreation or, more importantly for this study, for education purposes.

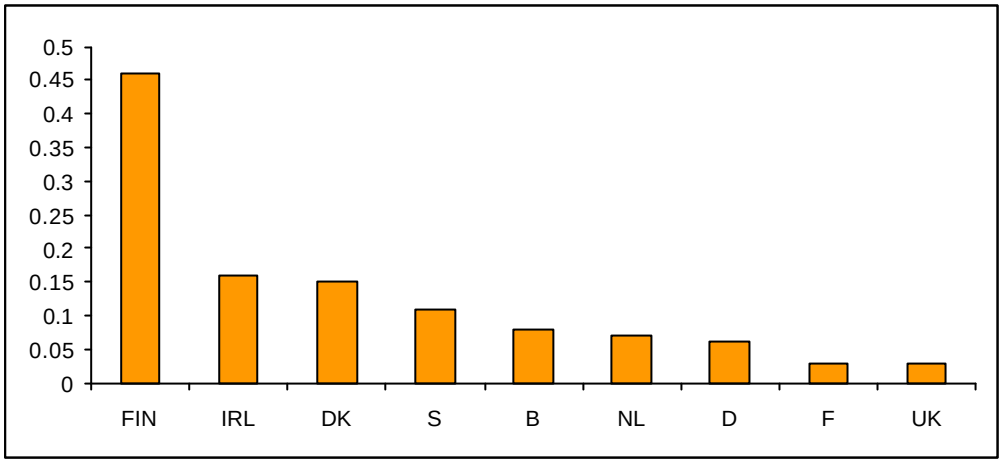


Figure 9: Public Internet access points per 1000 inhabitants: Source: European Communities, 2001

The level of home ISDN access is quite low generally. However, a comparison of the levels reflects the general ranking of the member states in terms of access to technology. The countries with the least home ISDN access are France, Spain, Ireland, Portugal, all with between 1% and 3%. Surprisingly, Greece had no home ISDN connections in 1999. Finland (6%) and Sweden (4%), which were in the top five countries for the majority of the indicators fall to sixth and seventh place respectively. The UK, Belgium and Italy make up the remaining countries falling within 3% to 4% access. The Netherlands, Luxembourg and Denmark all have over 10% ISDN home connection.

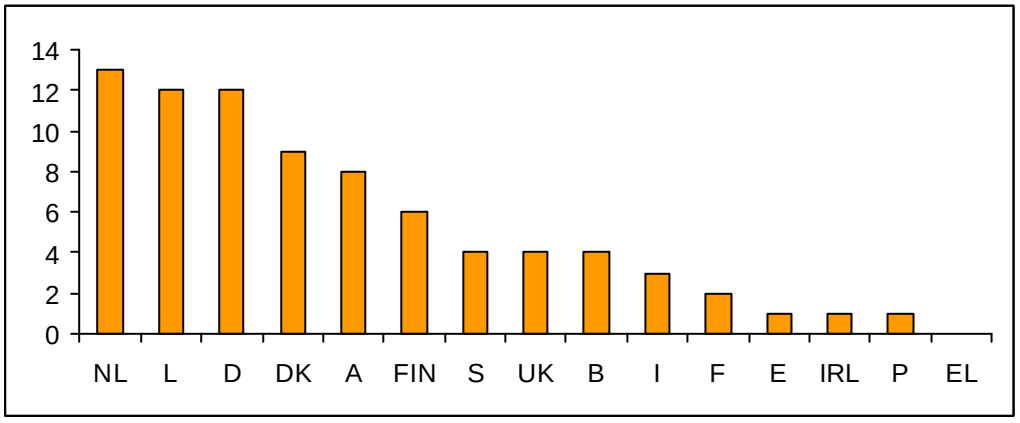


Figure 10: Home ISDN access (%), 1999: Source: Hobley, 2001

A study undertaken by the European Competitive Telecommunications Association (ECTA, 2002) revealed that the total number of Digital Subscriber Lines (DSL) in the EU had reached almost six million after one million lines had been added in the second quarter of 2002. Three percent of these are over unbundled lines. Of the remaining lines, 80-90% are typically retailed by the incumbents. The UK placed highest among the member states in terms of the level of competition. With regard to the numbers of DSL connections, Germany, France and Spain rank most highly while Ireland, Greece and Luxembourg have the lowest.

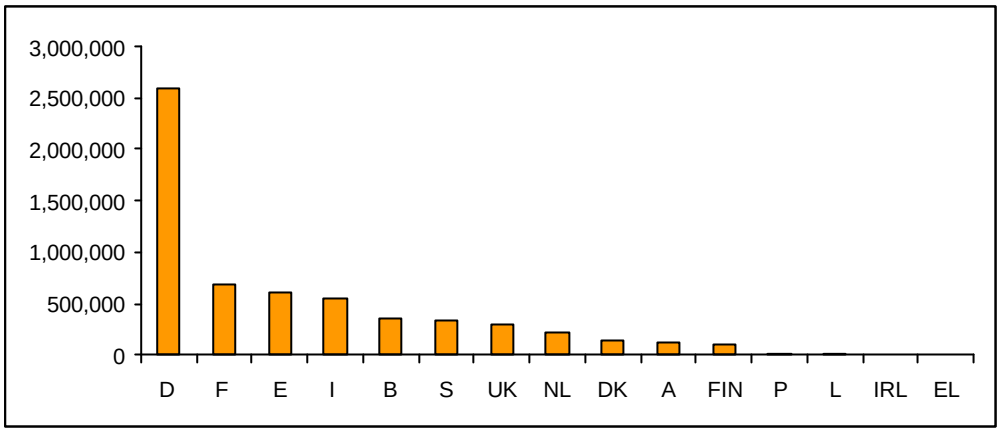


Figure 11: Total DSL connections: Source: ECTA, 2002

The final indicator, which will be investigated, is the numbers of European Computer Driving Licence (ECDL) skill cards issued within the member states. Skill cards are issued when a student enrols for the course. At a very general level, one can see that Sweden, the UK, and Italy rank highest among the member states with above 200,000 skill cards issued, Ireland and Denmark have over 100,000, Germany and Austria have over 80,000 while the remaining states, France the Netherlands and Greece have above 16,000. The remaining countries, Belgium, Portugal and Spain have less than 4,000. It should be noted that the figures for Luxembourg are included in the French figure, Finland has its own computer driving licence (CDL) amounting to over 100,000, while Spain, Portugal, Belgium and Greece started late.

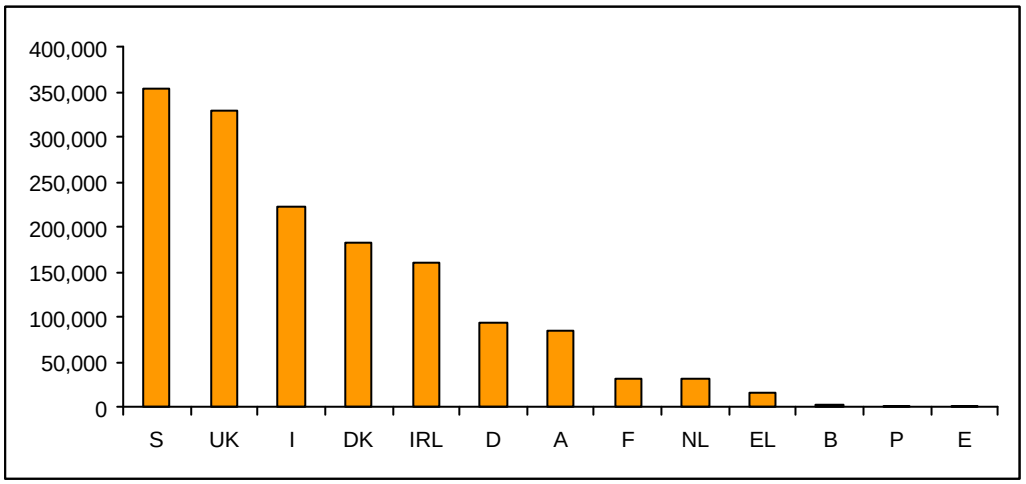


Figure 12: ECDL cards issued to the end of December 2001 (Source: Personal Correspondence)

Policy Contexts

The rigorous implementation and liberalisation of the telecommunications market throughout the EU is progressing. Through offering innovative and cheaper services a demand for communication and access services is developing, which in turn stimulates new investment. It is quite difficult to draw comparisons between the countries as all exhibit both positive and negative elements when all aspects of the market are taken into account. For example, the Greek, Spanish and Portuguese markets have all been fully liberalised but, despite this fact, many vital services are lacking. Local loop competition/unbundling, leased line competition/prices, and the promotion of broadband Internet services are all lacking. This is one of the key factors leading to their poor rating in comparison to the other member states for most of the access to technology indicators. The level of telecommunications deregulation can also partly explain the poor performance of Ireland in relation to the other states and their access to technology. No local loops have been unbundled, 3G rollout is sluggish and access to broadband connections is quite low. However, as stated above, there are positive elements

as the government is taking measures, outlined in the section covering Ireland, to address this problem.

Through the findings of the survey undertaken by the ECTA it was revealed that the incumbents have too much power within the broadband market (ECTA, 2002),. Figures revealed that DSL connections are three times more common than cable. Thus, future mass-market provision of broadband will rely greatly on DSL. With the number of connections through local loop unbundling only amounting to 3%, it is obviously not working. The blame for this is attributed to too high up-front costs and excessive pricing and provisioning delays by the incumbents. The report stated that the "incumbents are extending their dominance from retail voice into the new broadband market". An example of this dominance can be seen in France and Germany where over ninety percent of the market is controlled by the incumbent and effective interconnect products are not available. European incumbents are producing ten times more DSL connections per week than local loops are being unbundled. The ECTA believe that there should be a 'twin-track response' by policy makers. There should be "stronger enforcement of existing local loop unbundling law by both the European Commission and National Regulatory Authorities, coupled with new measures to introduce effective cost-orientated DSL interconnection". Without undertaking these measures, there will not be a competitive broadband market in Europe.

The countries performing the best in most of the access to technology indicators are those with advanced telecommunications markets despite their having some negative elements. In Sweden, fair competition has not been allowed to develop but the 3G rollout is on target and the partially state-funded provision of broadband services to all houses is progressing well. Non-compliance to free rights of way of local authorities and other bodies, along with the inhibiting of third generation rollout, is causing problems in Belgium. Access to unbundled local loops, however, is ensured and Belgium is one of the first of the member states to provide shared use on a commercial basis which is availed of. There is no evidence of significant uptake of shared access to the local loop and new entrants into the market are complaining about market entry barriers in Finland. Despite this, Finland has a very highly developed telecommunications market and infrastructure. Local loop unbundling and competition in the leased lines market is problematic in the UK but OFTEL offers flat rates for Internet access. Denmark is witnessing substantial growth in the number of unbundled loop lines while Austria has the fastest ASDL rollout in the EU. In Luxembourg, the incumbent dominates fixed local loop access and no licensing regime for 3G has been adopted. These seem relatively irrelevant when the fact that all of the countries' legislation with regards to licensing, interconnection, tariffs, rights of way and consumer issues meet with EU legislation and it ranks highly within the EU concerning access to technology.

Despite many problems within its telecommunications market, such as poor competition and the slow development of licensing procedures, the Netherlands seems to consistently appear in the top half of the access to technology indicators within the member states. As a result of active opening of the telecommunications market, Germany has reduced Internet and telephone charges, has a high level of local loop provision and rapidly developing and innovative market. Thus it is not surprising that it ranks quite highly in the levels of access to technology in the EU. However, it does not surpass the countries mentioned in the above paragraph. Other countries that are progressing well in the deregulation of their telecommunications market but generally do not rank in the top half are Italy and France.

The industry seems to play an important part in a number of initiatives throughout all of the member states. Public/private partnerships are evident in all of the states. This can be in any of the sectors. The education systems in the EU have benefited greatly from such partnerships with a large amount of investment in software, hardware and skills deriving from such arrangements. Various initiatives, which provide technology for the general public and assist in infrastructural development, mentioned in the individual country profiles have also been quite effective. Thus, the rapid development of the European information society owes much to the assistance of the various industries regardless of their motivations for such assistance.

One overriding commonality among all of the EU member states is their realisation that involvement in the emerging information society is of vital importance. All of the states invested huge amounts of money into all sectors and areas of society, at both a national and local level, with the aim of diffusing access and information and to develop individual and workforce skills. Without exception, they all identified the development of the education system as a key factor for, and vital driving force behind, this development. Policies have provided schools with low cost, subsidised, and in some cases, free access and equipment to enhance diffusion and raise the human capital of each country. It is important to note at this point that there is a definite connection between levels of income, education and ICT adoption/use. To investigate levels of income and educational attainment, which are important in causing the digital divide, would be beyond the scope of this paper. It is worth noting, however, that at the same level of income higher levels of education will result in higher rates of ICT adoption (OECD, 2001b). Thus, the attention education systems are receiving from information society policies is definitely warranted. Public institutions such as libraries, post offices, government facilities etc. have all been targeted by policies as these offer cheap, if not free, access which in turn will develop skills and familiarity. Underprivileged groups such as the elderly, disabled, those living in rural areas or in poverty have all been the focus of policies to improve access. Many policies have been put in place to encourage small businesses to adopt ICTs.

With this in mind the disparities in access to, and use of, ICTs, which is evident through the comparison above, might seem puzzling. The level of telecommunications deregulation partly explains this but does not go far enough. If all of the states are actively pursuing the development of their information societies, how can there be such great disparities present? After the levels of telecommunications regulation are considered, there are two interconnected factors. The first is the date the member states began implementing initiatives to address the problem. It will become apparent below, that this, while being of importance and significance, does not go far enough in explaining the disparities. The second factor is the varying levels of socio-economic development which presumably in turn influenced, to a greater or lesser extent, the state's ability to focus efforts and investment on information society initiatives.

States may be divided into four groupings with regard to date of implementation of information society initiatives (not the realisation of the need for policy change or the drawing up of initiatives, which occurred before the dates of implementation in some cases). The first grouping, comprising Belgium, Finland, France, Denmark, the Netherlands and Sweden, took actions towards addressing issues relating to the information society pre-1995. The second grouping, consisting of Austria, the UK, Spain and Luxembourg, began implementing initiatives in this area in 1995. (It must be noted that Spain falls within this grouping due to the fact that one of its initiatives, which was purely technology orientated, dates to 1995. Its more information society related initiatives, however, began at a later date). Germany stands alone in the third grouping as it began implementing information society type initiatives in 1996. The final grouping (post-1996) is made up of Greece, Ireland, Italy and Portugal.

A vital factor in a country's ability to propagate an information society, regardless of when it began implementing initiatives or restructuring its telecommunications market, is its socio-economic characteristics. Where wealth and thus infrastructure is concerned, Greece, Spain, Ireland, Italy and Portugal were clearly at a disadvantage prior to any realisation of there being an information society or a need to promote it. For a variety of wide ranging socio-economic and political reasons, these countries were at a disadvantage with regard to their ability to harness the opportunities offered by the 'Information Age' from the start. This, when combined with the timing of their implementation of initiatives and telecommunications market restructuring, helps to make some sense of their generally poor performance with regard to access to technology in many of the areas above.

Emerging Patterns

A very general pattern becomes quite apparent throughout the comparisons of both access to technology and the various policy contexts within the member states. All of the states have

been actively pursuing the development of their information societies and deregulation of telecommunications markets. There is a definite correlation between the time of initiative implementation, level of deregulation, socio-economic background, and the extent of access to technologies, with a few exceptions. Analysis of the combination of factors has proposed a three way split comprising five member states in each group. The first group is most advanced in terms of access to technology, while the bottom group include the poorer performers. The states in the middle group though the order in which they appear varies, tend to remain among the middle third.

The countries which fall into the first grouping, with the exception of France and Belgium, were also the first to implement information society initiatives. They all fall within the top third of states with regard to levels of access to technology. Luxembourg also falls within this top third for all of the access to technology indicators despite being placed within the second grouping of initiative implementation. These countries also seem to have the most cutting-edge telecommunications policies such as the state provision of broadband connections to all homes in Sweden.

The middle grouping comprises France, Austria, Germany, Italy and the UK Italy tends to be within this middle third despite implementing initiatives at a later stage. Belgium, which was among the first of the states to begin implementing initiatives, surprisingly joins the poor performers with regard to use of and access to technology. The other four, Greece, Spain, Portugal and Ireland, are the countries with the least favourable socio-economic background and thus less infrastructural development. They also were the late adopters of initiatives. These consistently fall within the bottom five for most of the indicators.

The Digital Divide

At a quite general level, the digital divide in the EU follows a similar pattern to the situation elsewhere in the world. As the dominant language of the Internet is English there is a division between those who speak English and those who do not.. Despite policies being implemented to promote the use of the native tongue ('Culture Net Sweden') for example, in many countries, the proportion of the population with the ability to speak English will affect the potential for participation in the information society. The chart below illustrates the differing levels of English spoken within the EU and how countries rank in comparison to each other (the UK and Ireland are omitted as English is the offical language).

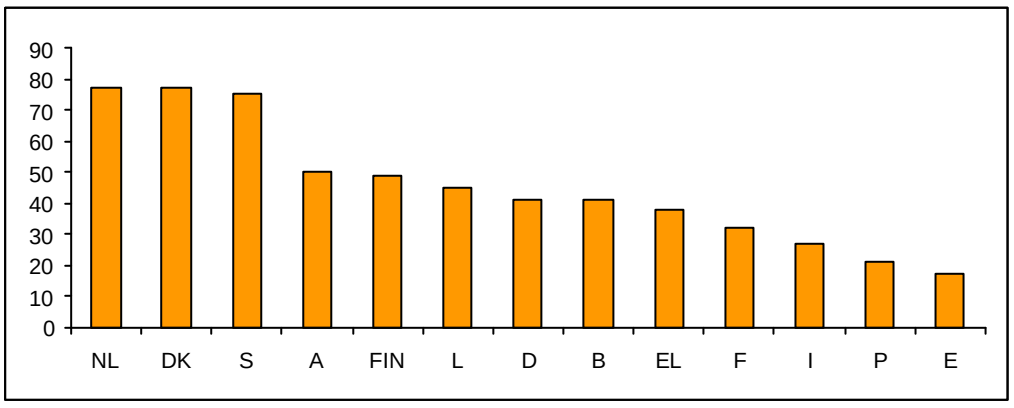


Figure13: English speakers (%), 2000: Source: West et. al. (Eds.), 2000

The language divide is decreasing as the Internet increasingly includes individual national and regional content. Where the problem still remains is in the areas such as online services, where most large companies are unable to respond to foreign-language email in the same language (Worldlingo, 2001a). Worldlingo (2001b) also state "under 5% of the fifty most visited Internet sites responded to foreign language email requests". Thus, as various languages are catered for within many sites, divisions still exist in relation to whether one can read/write English or not.

Another division exists, a gender divide. As illustrated above, throughout all of the European countries analysed there was a higher percentage of men using the Internet than women. This

divide has become much less straightforward. The gender divide used to be purely whether women use the Internet or not and how they compare to men. Today, the situation is much more complicated but still exists. The NTIA 2000 report outlined that, in the US, 'although the aggregate rates of use and growth by gender have equalized, there are still gender related differences in Internet use within various age groups. Women, from approximately twenty years of age to fifty, are more likely to be Internet users than men. From about age sixty and older, men have higher rates of Internet use than women'. It also points out that gender can also be considered in the context of household type. In previous years people who lived in single parent households, with children under the age of eighteen, headed by women were less likely to be Internet users. Thus, the gender divide still exists, just not in the conventional sense. Like other elements of the divide, it is not going to disappear, it will simply change in form.

Urban homes and regions are more connected and have a higher quality of connections than rural ones (OECD, 2001b). Thus, if a country has a higher percentage of population living in urban areas, there will be a greater number of its population with access to higher quality ICTs. Despite having a larger population living in rural areas, Finland rates highly for most of the access to technology indicators (a result of the impact of policies and socio-economic development) while Spain ranks poorly for these despite having a roughly average number of urban residents. As a result, this could not be viewed as a major indicator of how countries rank in terms of the European information society but does illustrate a type of divide within the EU.

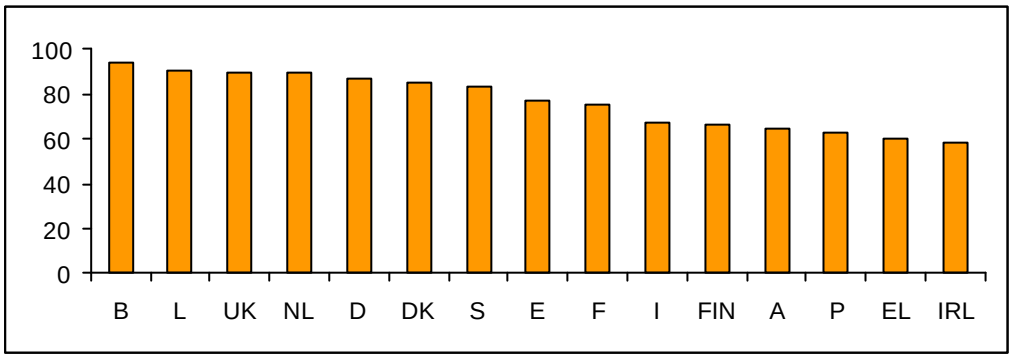


Figure 14: Population living in urban areas (%), 2000: Source: UNDP, 2001

From the analysis of differential access to technology, varying policy contexts and the patterns that emerge, there is overwhelming evidence of the presence of a digital divide between the countries of the European Union. This divide is present as some countries, on average, perform better than others in the provision of ICTs, and ICT related services. There is a variance in how well each of the countries perform over all of the indicators as they may rank higher in some areas but poorly in others. For example Belgium ranks quite highly in terms of the number of PCs per one hundred inhabitants (39) but is among the bottom four countries for the percentage of population with Internet access (14%). Similarly, Germany has a reasonably high percentage of its population (20%) having access to the Internet but is placed among the bottom four nations where pupils per PC both with (40%) and without (20%) Internet connections are concerned. Due to the fact that the majority of states can shift between performing well and quite badly, but on average rank within the same five countries, it will be suggested at this point that there are varying degrees of a digital divide within the EU.

The first form it takes is a division that separates the EU member states into three groups.

This division is as follows:

Leading	*Intermediates*	*Lagging*
Sweden	Austria	Ireland
Finland	Germany	Italy
Denmark	France	Spain
The Netherlands	UK	Portugal
Luxembourg	Belgium	Greece

On average, these countries fall within the same third in terms of access to ICTs. The leading group generally remains as is but there are exceptions. For example, Sweden falls into the 'intermediates' for the percentage of mobile phone subscriptions (71.9%) as does Finland (72.1%), while the Netherlands does for PCs per one hundred inhabitants (35). The same applies for the lagging group as Italy moves into the 'intermediates' for the percentage of population with Internet access (16%) as does Ireland for the number of pupils per PC (9) and per PCs connected to the Internet (18%). Despite the few movements which occur, the countries, as a result of their performance in other areas of access to technology, remain within these groupings thus there is a tripartite division.

Another divide also manifests itself, the 'North-South' divide. In relation to the numbers of PCs, Internet access, the numbers of pupils per computer and access to broadband services, Portugal, Spain and Greece remain in the lagging group without exception. These three countries rank quite highly in terms of the percentage of the population with access to the Internet at university. This will be touched upon below but at this point it will be argued that this is not a sufficiently important indicator to counteract this division. It is the combination of the fact that for any of the major indicators they do not move out of the lagging group at all and the extent to which they are behind the leading group that makes this division of more permanence than the tripartite division.

In terms of PCs per one hundred inhabitants, Greece (11), Spain (15) and Portugal (22) are far outshadowed by the leading countries. Of the leading group, Denmark has sixty-one computers per one hundred inhabitants while Luxembourg has fifty-two and Sweden has fifty-one. There are similar differences between the figures for the numbers of PCs per student off-line. While Sweden, Finland and Denmark all have over forty percent of their population having access to the Internet, Spain, Portugal and Greece all have less than eleven percent. The availability of broadband connections for both schools and homes within these countries, as illustrated in the 'other indicators of access to technology' section above, is a fraction of what the figure is elsewhere.

We have suggested explanations for these differences in access to technology between the southernmost countries in the EU and the other nations. These countries were late starters in terms of when they actually began implementing their initiatives. They are also not developing their telecommunications infrastructure as rapidly as the nations that are constantly being placed above them in terms of ICT use and availability. Most importantly, they did not have the same socio-economic development which was vital in the rapid development of the other nations' information societies. Thus, it is likely that, over time, they will catch up to the levels some of the other countries are at now. However, the other countries may have developed even further by then and, though by today's standards Greece, Portugal, and Spain would be well-developed, they may still be considered to be lacking in future.

Impact of Government Policies

One fact that has become obvious throughout this analysis is that government policies have a substantial impact on the performance of nations in the European information society. The nations which led the way, and generally tend to remain in the lead, are those which have been experiencing very proactive governmental policies from an early stage. The success of these policies seems to have had a knock-on effect, as other nations followed suit in later years. The adoption of policies, and the positive effects which resulted, laid the foundations for the realisation, by heads of state, that Europe has the ability to become "the most

competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion" (European Commission, 2001b).

At a national level, these governmental policies have provided the opportunity for quite substantial development to nations which were, and had been for some time, lagging behind. For example, despite being a very poor performer in terms of access to the Internet and percentage of PCs available to the population, Ireland is placed among the top half of EU member states in areas closely connected to information society policies. Ireland had nine students per PC in 2000. This is only two below the leading three nations, namely Luxembourg (3), Denmark (3) and Finland (6). The group with which Ireland tends to be placed, have almost twice this number in some instances and much more in others. In relation to PIAPs Ireland, again, breaks the trend as it is placed second only to Finland. Ireland also has the fourth highest number of graduates in Science and technology as a percentage of twenty to twenty-four year olds. As Ireland is among the late starters, has one of the least developed telecommunications infrastructures in the EU, and with the exception of these examples, consistently falls into the lagging group, a key reason for performing well in these areas must be the government policies implemented.

Despite their weaker performance in relation to the major indicators, Spain, Portugal and Greece are benefiting from government policies aimed at securing a position in the information society. Evidence of this is that Greece (55%), Spain (63%) and Portugal (71%) are all above the EU average (51%) for the growth of Internet users between 1998 and 1999 (ESIS, 2000a). The fact that these countries, despite their poorer information infrastructures, later implementation of policies, and socio-economic disadvantage, have a high level of Internet access at universities stands as testament to the effectiveness of governmental policies.

Policies to address the social exclusion of underprivileged groups have been numerous throughout the member states. It would be difficult to quantify these but, at any level, measures to include marginalised citizens are of huge significance and importance. Policies have also been used, with great effectiveness, in combating demographic problems such as having a reasonably large rural population, which became evident in the analysis of the urban/rural ratio. Finland, despite having a larger number of rural dwellers then the other leading nations, which could result in lower access to high quality ICTs, has remained an information society leader.

The various policies implemented help to push the leading nations' development as information societies/economies even further. They also assist in the steady development of the majority of the other nations, while presenting the opportunity for the more underdeveloped nations to foster a progressive environment from a stagnant one. Despite this, shortcomings are evident in that divides still exist. However, the situation would be much worse without the measures already taken.

Implications for eLearning and Distance Learning

As eLearning and distance learning are heavily reliant on Internet connections and multimedia equipment, the implication of differential access to these are great. Regardless of there being a demand or need for eLearning/distance education within the states, if the basic requirements are not available they simply could not develop at a rate in line with these demands or needs. The fact that some countries have higher levels of services is resulting in the digital divide encompassing education systems in addition to the other sectors and areas of society. Therefore, the provision of these services is of vital importance. This has been realised by the governments in various jurisdictions as policies and initiatives are being shaped with this in mind. Some countries will always lead in this area but it will be suggested at this point that there is a need to assist in the speeding up of the rate in which the lagging group is progressing. If this is not done, these countries, though developing at a reasonable rate, will always be overshadowed by the leading nations and thus the division will remain.

Also of great importance is the level at which the telecommunications infrastructures are at. The speed of Internet connections is becoming of increasing importance. As the analysis above illustrated, there are large variances in the level of high-speed connections between the states. While the provision of connections is vital, the type of connections is also important. Despite the availability of Internet connections or the numbers using the Internet for learning, if some countries have much faster connections they will, again, be at an advantage over the nations who do not. Broadband connections change the time spent, and the activities undertaken online greatly. It even effects the time spent at other activities such as watching TV and shopping. A detailed study of these changes are presented in a report produced by Pew Internet entitled 'The Broadband difference' (Pew Internet, 2002).

It must be noted at this point that, as it is closely connected to the availability of broadband, content is becoming the 'new frontier' of the digital divide (Children's Partnership, 2000). Again, this will affect eLearning and distance learning as, many simply do not think the Internet has anything for them and subsequently stay away from it. Children's Partnership (2000) states that low-income and underserved people for whom content is not 'useful' find the Internet is not meeting their needs in the following areas:

- Employment, education, business development and other information;
- Information that can be clearly understood by limited-literacy users;
- Information in multiple languages
- Opportunities to create content and interact with it so that it is culturally appropriate.

While some of these are closely related to the traditional divisions, one can see how this is emerging as a new element to the problem – the knowledge divide. If elements of society do not see the Internet as being of any use/relevance, they will not benefit from the opportunities offered through eLearning.

Finally, the importance of the provision of PIAPs to the public could not be overemphasised. While the more developed countries, with the exception of Ireland, tend to provide a greater number of these, it is the less developed states that would benefit the most from them. This is because of the fact that there are not as many Internet connections/PCs within homes in these countries and if the demand for eLearning and distance learning develops at least the public can take part in these services. This will also help the lagging states catch up even further as, again illustrated by the Irish experience, the level of their human capital will increase greatly as a result.

Summary/Conclusions

The comparative analysis has identified a number of technological divides. There is a divide evident as a result of the differing ability of EU citizens to speak English. This is because English has been the dominant language of the Internet and a lack of ability to speak it will result in a form of marginalisation. A gender divide is also evident. Throughout the member states, there is a dominance of males using the Internet. As this division decreases it is simply changing its form not disappearing, as exhibited by many of the other indicators. With only a couple of exceptions, there is another divide resulting from the proportion of people living in urban areas. In most cases, as would be expected, the countries with the larger number of people in urban areas tend to have higher levels of access to higher quality ICTs. These divisions coincide with ones resulting from differing levels of income and quality of housing etc.

Through analysing access to technology issues, it becomes apparent that there are disparities between the member states of the EU. These disparities follow a general trend with only a few exceptions. Generally, the same countries perform exceptionally well throughout all of the indicators. Similarly, the countries at the other end of the information society rating tend to stay there leaving the remainder to make up the middle ground. There is a definite correlation between the performance of these states as information societies, the timing of when they first implemented initiatives, the state of development of their telecommunications infrastructure, and their socio-economic background. On average, the same states perform roughly as well throughout all of the indicators. Two geographical divides have emerged from this analysis. The first divide relates to where states are ranked on a continuum of

technological development. The leading group includes Sweden, Finland, Denmark, the Netherlands and Luxembourg. The second, the 'intermediates', consists of Austria, Germany, France, the UK and Belgium. Finally the lagging group comprises Ireland, Italy, Spain, Portugal and Greece.

The second is a starker divide: the north-south divide. While other states move up or down on the rankings depending on the indicator, Greece, Portugal and Spain tend not to move out of the bottom five member states for the more important indicators investigated and are substantially far behind in their levels of ICT access and use. These countries are late starters and have to develop much to reach the levels the other states are at now but the goal posts could shift as the average level of ICT adoption and use within the EU rises. These countries could always remain in the bottom five states. A change in both national and EU policies is needed to increase the speed in which they are developing and thus assist in their catching up with the other states. At a national level, more focus could be placed on specific areas and through this open a gateway to catching up with other states at least in these areas. An example of how this can be done is evident in the Irish situation in relation to education. Portugal, and to a lesser extent, Spain and Greece have been focusing on education but more effort is required. At an EU level policies should go much further in assisting these nations as their lagging behind does not aid Europe in meeting its goal of becoming the leading knowledge-based society/economy in the world. The effectiveness of government policies in addressing the development of their information societies has become quite clear throughout this study. The early starters became leaders and set an examp le for other European nations, while the late starters and the countries with a lower level of telecommunications infrastructure were not completely left behind as a result of the government policies put into action.

The effect of successful telecommunications deregulation on reducing prices, improving infrastructures, and dispersing ICTs has to be looked to as a way to further assist the lagging group in catching up. This has to be done with more emphasis being placed on the importance of international/European intervention as opposed to individual member state policies. If an active approach was taken, at a European level, to assist the lagging group the 'north/south' divide could be significantly reduced. The importance of next generation communications such as digital TV and third generation mobile telephones cannot be underestimated. Rapid developments in these areas for the lagging group could result in a significant amount of catching up.

Finally, the development of eLearning and distance education throughout the EU will be greatly affected by the divisions mentioned above. Unequal access to the Internet and multimedia equipment will result in varying levels in the uptake of eLearning and distance education regardless of the demand for them. Further to this, even if there are increased connections and hardware/software, the quality of these is of importance. This is because, even though it might be seen as not being as serious, a new division is appearing - a division between states with high-speed connections and cutting edge multimedia equipment and those without. Building upon this even further, the broadband and content divides, on top of the others, if unchecked, could result in eLearning further compounding the problem of the digital divide, as only people from a certain social standing, with certain levels of education can and do avail of it and the advantages associated. This could result in the widening of the divide in this area. The negative side of eLearning has to be taken into consideration when assessing all of the positive factors in future policy making.

Education is the key to an inclusive information society, as it assists in the dispersal of, and confidence in, ICTs while increasing the human capital of a state, which facilitates further development. As the level of education increases, so will the rate of ICT use regardless of the level of income or social standing of citizens. As distance, lifelong and eLearning appear to be the future of learning in Europe, actively promoting their use is of vital importance. The reduction of the digital divide in the EU can be successfully addressed within a shorter timeframe through the development of telecommunications infrastructures, the promotion of PIAPs, and the various information society type initiatives put in place. However, all of these developments are useless if the more long-term solution, the incorporation of ICTs into education systems, does not take priority. Education, coinciding with telecommunications

provision development, provides the most definite solution to the digital divide within the EU. How this development can be accelerated is the key to reducing the divide sooner rather than later.

Appendix One - Austria

Socio-economic background

Austria has a population of 8.21 million (ITU, 2002) with 64.6% living in urban areas (UNDP, 2001). The country is 84,000 square kilometres in size (Eurostat, 2001a) with 98 inhabitants per square kilometre (ITU, 2002). The Austrian GDP[1] for 2000 was €25260 which is 12.1% above the fifteen member states (EU-15) weighted average (Eurostat, 2001b).

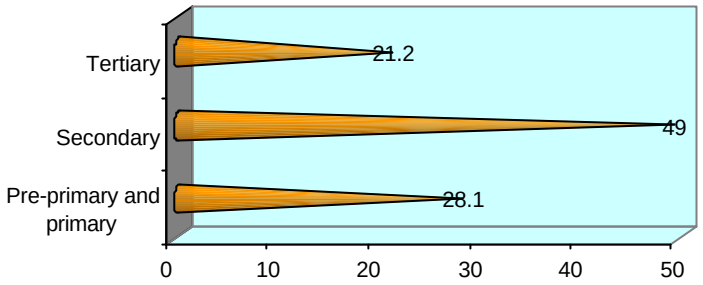


Figure A1: Public education expenditure by level (as % of all levels), 1995-97: Source, UNDP, 2001

10.4% of government expenditure was on public education, this is 5.4% of the GNP (UNDP, 2001). The rate of unemployment in Austria for the fourth quarter of 2000 was 3.9% (Eurostat, 2000b).

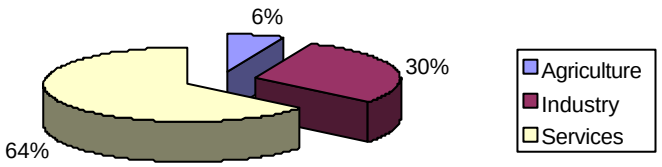


Figure A2: Total employment per sector, 1998: Source: Eurostat, 2000a

German is the most popular language in Austria with 7,500,000 people using it as their first language (Ethnologue, 2002a). Next to German the three most widely spoken second languages are English (50%), French (8%) and Italian (5%) (West et.al. (Eds.), 2000)[2].

Access to Technology

There were 77.2 mobile phone subscriptions per one hundred inhabitants in 2000 (Eurostat, 2002). In 1999 the number of PCs per one hundred inhabitants was 36, 20 of these were in homes while 16 were in businesses (ESIS, 2000a). The number of European Computer Driving Licence skills cards issued by the end of December 2001 was 84,132[3], (personal correspondence). Public Internet access points per one thousand inhabitants in 2001 was 0.04.

[1] All GDP figures used are GDP per capita.
[2] Figures used for spoken second languages throughout the report are percentage of respondents from data on foreign language learning (West et.al. (Eds.), 2000).
[3] Skills Cards are issued when a student enrols and do not reflect the number of people who have completed all 7 ECDL modules.

The total number of graduates in science and technology as a percentage of twenty to twenty four-year-old people in 1997 was 1.3% (ESDIS 2001).

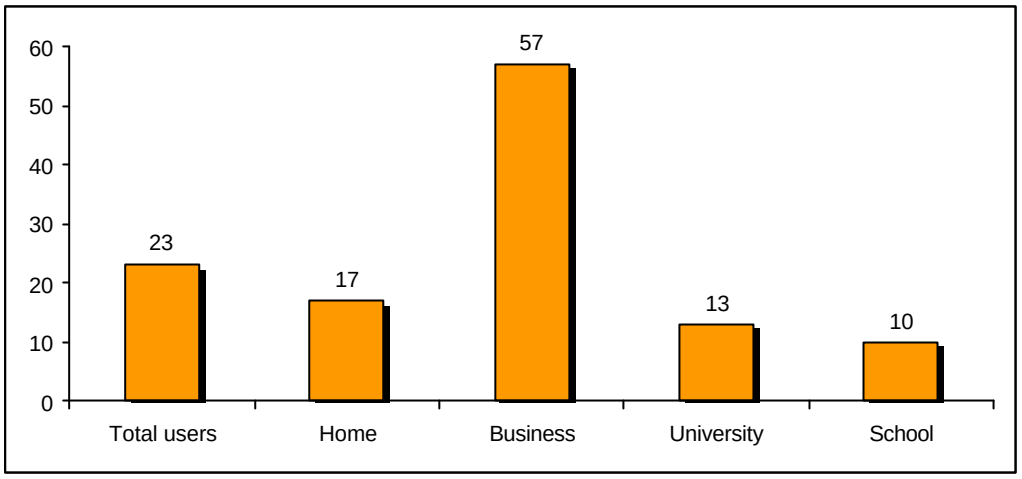


Figure A3: Total population with Internet access and location (%), 1999/2000: Source: ESIS, 2000a, Hobley, 2001

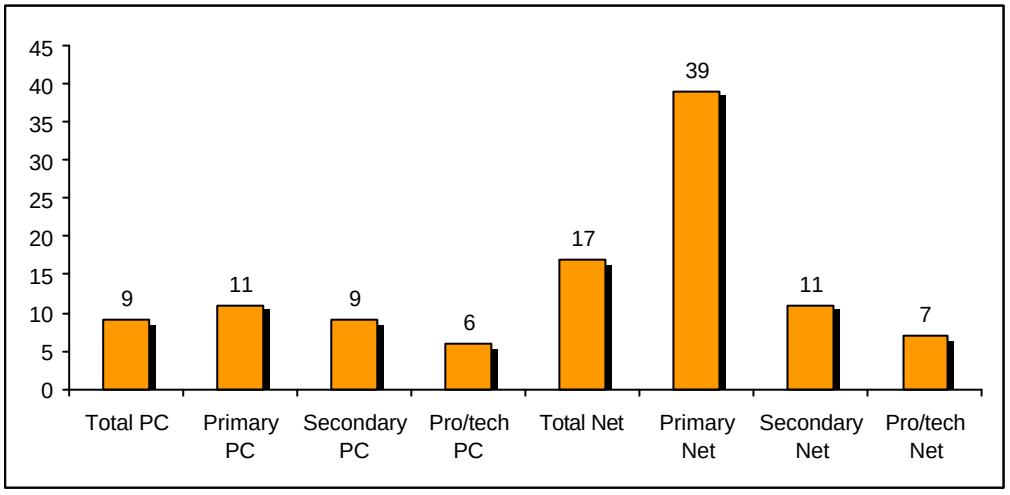


Figure A4: Pupils per PC/PC connected to the Internet, 2001: Source: eEurope, 2002a, Eurydice, 2001b

Extent of participation in distance learning

The Ministry of Science and Research has established study centres since 1981 in cooperation with the German FernUniversität in Hagen and the British Open University in Milton Keynes. The Austrian institution for distance learning, Zentrum für Fernstudien Universität Linz (ZFUL), was established in 1991. As it was part of the University of Linz it was integrated into the national structure of higher education. There are approximately 2000 students registered. The state fully funds the programme. The entry requirements are similar to the Austrian universities. There are three study centres. They are located in Bregenz, Linz and Vienna (EADTU, 1998).

Telecommunications regulation

The Austrian telecommunications market is growing rapidly, 14.4% in 2000, and is mainly driven by the mobile market. ADSL (asynchronous digital subscriber line) roll out is the fastest in the EU. The market share in fixed voice telephony and tariffs of the incumbent (Telecom Austria) have been significantly decreased. There are many other operators competing with the incumbent and further privatisation has resulted in state ownership in it decreasing to 47.8%. The NRA (national regulatory authority) believes that the restructuring

has had no negative effect on the continuity of its regulatory policy. Local loop unbundling is now starting to take off after prolonged incumbent domination which is also evident in relation to tariffs. 3G rollout is to begin in late 2002 (European Commission, 2001b).

Provision of technology to the education system

There are many public/private partnerships within the Austrian education system. For example, companies such as Siemens and Philips have associated themselves with vocational education for a long time. Many initiatives are in place such as the setting up of e-learning academies, ICT scientific centres and the extending of opportunities for training. Infrastructurally, the government's main aim is to secure 'efficient Internet access and the best possible facilities for all schools and training bodies'. All upper secondary schools for which the federal authorities are responsible have been provided with the facilities required to be linked to the Internet since 1999 (Eurydice, 2001a). As well of access through other operators, all Federal schools and nearly half of the national schools have been provided with Internet connections while 17,000 teachers have been provided with Internet access through the Austrian School Network. Half of specialist teachers have been provided with ICT training. There are also plans for an increase of bandwidth in federal schools by the end of 2003 (Chatrie et. al., 2000).

In the index of the information society for the EU Austria ranks eighth. The telecommunications initiative in 1994 marked the beginning of Austria's move towards actively promoting the information society. This set out the framework for subsequent initiatives. Under the Austrian's way into the Information Society initiative (1995-1996), the Federal Chancellery set up the 'Information Society Working Group' to recognise opportunities and threats posed by Information society development within Austria and the best way to enter it. The work done by each of these working groups provided the groundwork necessary to produce 'The Federal Information Society Report: an Austrian Strategy and Action Plan' in April 1997. By October the government prepared an 'Information Society Action Plan' which was updated in 1998. At a regional level, each province had its own initiatives in place in 1996. These include: SchoolNet – Vorarlberg/Brugenland; IndustryNet – Styria; Network for Graphic and Print Industry – Salzburg; CultureNet – Upper Austria; Alpine-Adria Net – Carinthia; and Net for Public Administration – Tyrol.

February 2000 saw the launch of the 'Digital Austria Initiative' which is a partnership between the government and industry with the overriding aim to rapidly develop the information society. In April 2000 the 'Government's Information and Communication Project' was launched. It takes on board the priorities of the eEurope initiative. The actions taken under these initiatives are numerous. Some of the major ones are outlined below.

eGovernment

The @mtshelfer online project connects all of the local and national governmental bodies and public services on one site. Free access to legal and other information is provided. Further development of this site is planned.

eBusiness

ICT programmes such as 'EDI Business Austria', 'Multimedia Business Austria' have been implemented. There has been the establishment of 'competence centres' between the scientific community and businesses. Some operators are offering free Internet access for private households.

ICT for rural areas

An Internet portal for rural areas has been provided by the Agriculture Department. The computer equipment and Internet connections for the rural community under the PC-Aktion, 'Profit-Paket'. The BMLF Infonet is an information system on country, forest and water.

Social Field

Specialist information systems on health have been established.

Museum and cultural heritage

A database of the national library catalogue has been constructed. DERAL provides telematics for libraries in rural areas.

Appendix Two: Belgium

Socio-economic background

Belgium has a total area of 31,000 square kilometres (Eurostat, 2001). The population amounts to 10.16 million with approximately 332 inhabitants per square kilometre (ITU, 2002). A large proportion of the population, 93.7%, lives in urban areas (UNDP, 2001). The GDP for 2000 was €24,220 (Eurostat, 2001b). This is 7.5% above the EU -15 weighted average.

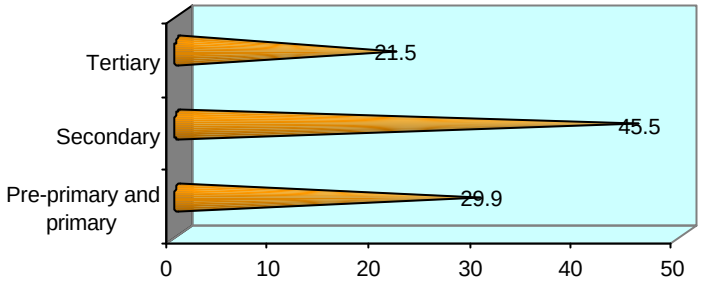


Figure A5: Public education expenditure by level (as % of all levels), 1995-97: Source: UNDP, 2001

Six percent of government expenditure was on public education, 3.1% of the GNP (UNDP, 2000). Unemployment was at 6.7% for the fourth quarter of 2000 (Eurostat, 2000b).

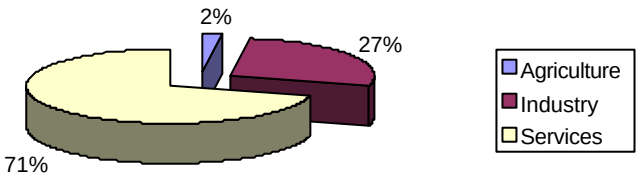


Figure A6: Total employment per sector, 1998:Source: Eurostat, 2000a

The main language in Belgium is Dutch. The number of people actively speaking it is 4,620,150 (Ethnologue, 2002b). Of the remaining second languages spoken, the three most widely spoken are English (41%), French (38%) and German (14%) (West et.al. (Eds.), 2000).

Access to Technology

There were 52.1 mobile phone subscriptions per one hundred inhabitants in 2000 (Eurostat, 2002). In 1999 the number of PCs per one hundred inhabitants was 39, 19 of these were in homes while 20 were in businesses (ESIS, 2000a). The number of European Computer Driving Licence skills cards issued by the end of December 2001 was 3,040 (personal correspondence). Public Internet access points per one thousand inhabitants in 2001 was 0.08 (EDDIS 2001). The total number of graduates in science and technology as a percentage of twenty to twenty four-year-old people in 1997 was 3.1% (ESDIS 2001).

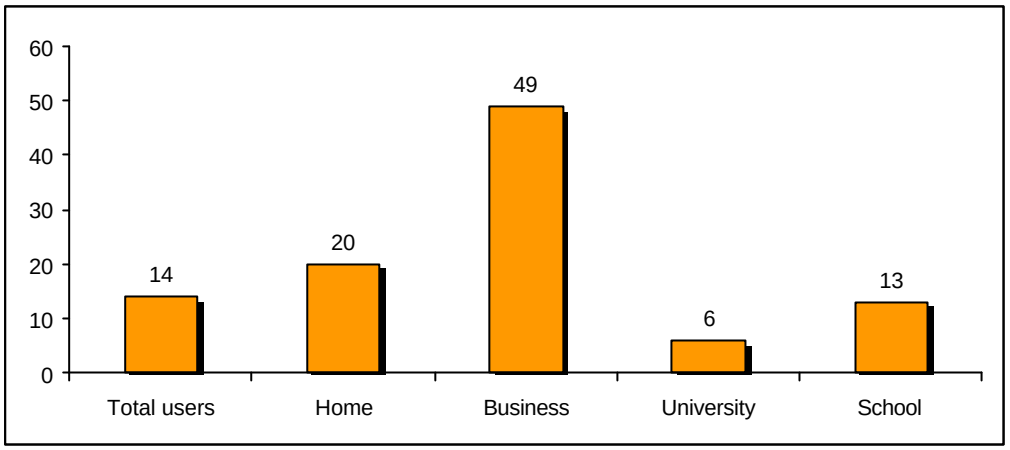


Figure A7: Total population with Internet access and location (%), 1999/2000: Source: ESIS, 2000a, Hobley, 2001

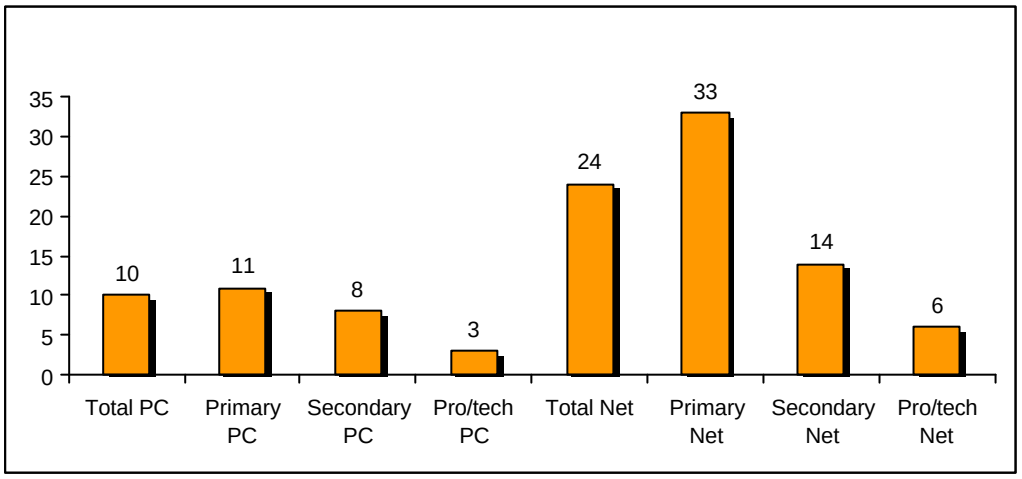


Figure A8: Pupils per PC/PC connected to the Internet, 2001: Source: eEurope, 2002a, Eurydice, 2001b

Extent of participation in distance learning

Distance learning in Belgium has had legal status since 1985. A consortium of Flemish universities and other educational institutions in Flanders and Brussels, 'The Stuurgroep Open Hoger Onderwijs' (STOHO), made an agreement with the Open Universiteit of the Netherlands that all their courses were made available to Flemish students in the 1980s, however this organisation has since disbanded. Distance education is offered by a number of universities.

Telecommunications regulation

The National Regulatory Authority (NRA) in Belgium has, through legislative measures, actively improved the conditions in relation to interconnection and licensing. They have been developing the market through regulatory developments. One result has been ensuring access to unbundled local loops. Belgium is among the first of the member states to provide shared use, on a commercial basis, which is actually availed of. Tariffs for fixed to mobile termination charged by the mobile arm of the incumbent, Belgacom, are being reduced with the result that their termination rates are the fourth lowest in the community. Third generation networks in Belgium could be inhibited, as there is a lack of antenna building permits. There are also problems arising from non-compliance with federal laws regarding free rights of way of local authorities and other bodies (European Commission, 2001b).

Provision of technology to the education system

Belgium operates a separate education system for French, Flemish and German communities. ICT policies also vary between the communities. These will be dealt with separately in the following section.

The general strategy of the French community is to incorporate ICTs into different subjects rather than simply introducing a course in the area. 'The Scheme for multimedia equipment' was set up in 1998 and had the principal aim of providing any primary or secondary school with the technology if they required it. As a result of this project, all of the primary and secondary schools in Wallonia and Region of Brussels, requiring the equipment received it. Under the 'Connecting to the Internet' scheme, which also began in 1998, the French community and the incumbent, Belgacom, provided a number of schools with Internet access for an annual fee which included the line installation, cost of communications, licence fees and no time limits.

The German speaking community has also been providing ICTs to schools. A similar agreement to the French community involving Belgacom began in the German community in 1998. Since 1999 the CyberMédia Initiative has been providing schools with computers and multimedia equipment. The Flemish community has a number of public/private initiatives in place. The PC/KD programme, which began in 1998, uses connections between retailers and computer companies to gain discounts for equipment for schools. They also have a deal with Belgacom for cheap provision of Internet access. Another operator, Telenet, offers instillation, cheap rates etc for schools. There are also a large number of projects and initiatives in place in each of the three communities which provide training for both teachers and students in the use of ICTs (Eurydice, 2001a).

National, local and regional information society initiatives

In 2000 Belgium was ranked seventh in the information society index for the EU. Federal initiatives dealing with ICTs date back to 1994. These were mainly concerned with the diffusion of telecommunications. By May 1997 initiatives to stimulate progression into the information society began and a council of federal ministers was formed which was entirely devoted to this. In 1998 an initiative called '@GORA, Les Assises de la Société de l'Information' focused on specific public groups encompassing various aspects of the interaction with the information society. The Flemish government released a policy document which aimed to 'build the Flemish Information Society'. Initiatives launched included the establishment of an interactive broadband network on existing infrastructures (1995-96) and various multimedia development initiatives (1998). In 1996 the Walloon region launched two initiatives. One was the programme for the development of a telecommunications policy in the Walloon region and the other, WIN, aimed to develop a region-wide fibre network. Specific actions to promote the information society in the Walloon region were launched in November 1997.

Governmental initiatives

A national Consultative Committee was put in place in October 1999 to remove obstacles to the development of the information society. There were many other such initiatives put in place to develop the Federal Administration through the use of ICTs. The Government of Flanders proposed a number of policies designed to address the use of ICTs in society entitled 'The Coalition Agreement: A new project for Flanders 2000-2004'. Included in this are measures to integrate ICTs into public administration and education. It also made the funds available for technological research. The 'Digital Action Plan' has the main aim of increasing the strength of Flanders as an information economy. 'A new Flemish project for the coming decades: the Colour memo' was drawn up on 7 July 2000. This stresses the importance of the information society and the necessity to 'respond quickly and creatively to the enormous opportunities offered by the new economy, but at the same time, as protecting ourselves against its detrimental effects on society'. (Chatrie et. al., 2000) The Walloon government adopted a general development plan called 'Contract d'Avenir pour la Wallonie' (contract for a future for Wallonia) in September 1999, which was revised in 2000. It is involved in the promotion of the use of ICTs in businesses, research and development, education, and by the general public.

Appendix Three - Denmark

Socio-economic background

Denmark is 43,000 square kilometres in size. It has a population of 5.33 million with, on average, 124 people per square kilometre (ITU, 2002). 85.3% live in urban areas (UNDP, 2001). In 2000 Danish GDP was €33,060 which is 46.7% higher than the EU-15 weighted average (Eurostat, 2001b).

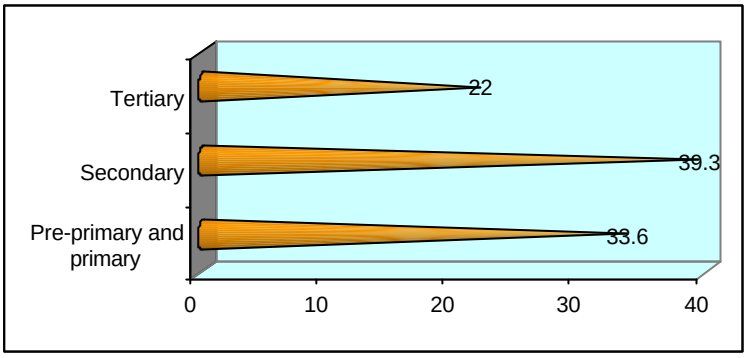


Figure A9: Public education expenditure by level (as % of all levels), 1995-97: Source: UNDP, 2001

13.1% of the total government expenditure, 8.1% of the GNP, was spent on public education (UNDP, 2001). The unemployment rate for the fourth quarter of 2000 was 5.6% (Eurostat, 2000b). Employment per sector is as follows:

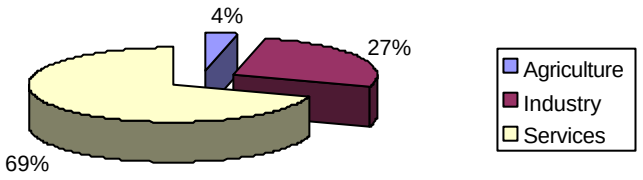


Figure A10: Total employment per sector, 1998: Source: Eurostat, 2000a

The main language is Danish with 5,000,000 people speaking it as their first language (Ethnologue, 2002c). After Danish the three most popular second languages spoken are English (77%), German (49%) and French (10%) (West et. al. (Eds.), 2000).

Access to Technology

There were 63.1 mobile phone subscriptions per one hundred inhabitants in 2000 (Eurostat, 2002). In 1999 the number of PCs per one hundred inhabitants was 61. 33 of these were in homes while 28 were in businesses (ESIS, 2000a). The number of European Computer Driving Licence skills cards issued by the end of December 2001 was 182,044(personal correspondence). Public Internet access points per one thousand inhabitants in 2001 was 0.15. The total number of graduates in science and technology as a percentage of twenty to twenty four-year-old people in 1997 was 2.6% (ESDIS 2001).

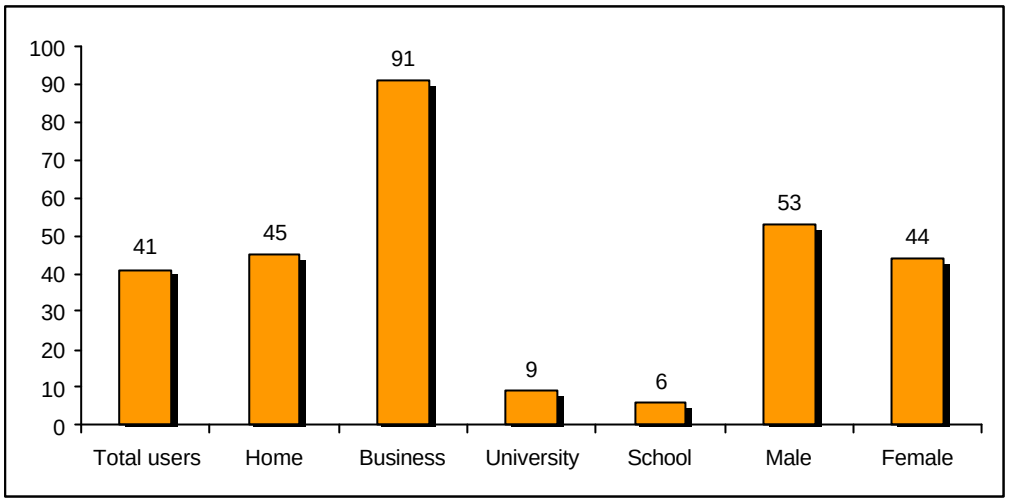


Figure A11: Total population with Internet access, location and gender (%), 1999/2000: Source: ESIS, 2000a, Hobley, 2001

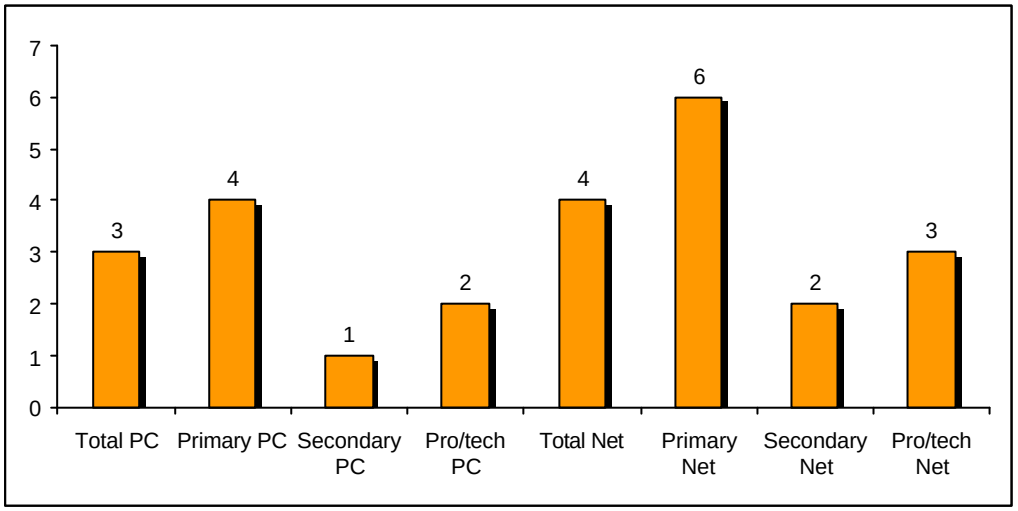


Figure A12: Pupils per PC/PC connected to the Internet, 2001: eEurope, 2002a, Eurydice, 2001b

Extent of participation in distance learning

Established in 1982,the Jysk Åbent Universitet, became the Danish Association of Open Universities (DAOU) in 1995. In 1996 there were 8970 students registered. Usually, entry requirements for the national universities apply for the open universities. No specific study centres have been established for open university students exclusively (EADTU, 1998).

Telecommunications regulation

The Danish telecommunications market is growing quite rapidly, 6.2% in 2000, with the majority of this growth being in mobile services. Levels of expenditure per capita on telecommunications for 2000, at 10% more than 1999, was the highest in the EU. There has been substantial growth in the number of unbundled local loop lines. As the National Telecom Agency (NTA) requirements for individual licences only applies to mobile networks and frequencies, Denmark offers few procedural barriers to market entry (European Commission, 2001b).

Provision of technology to the education system

A number of major initiatives have been put in place in the area of ICT provision for educational purposes. A general action plan for incorporating ICTs into the education system was called 'ICT in the Education System: action plan for 1998-2003' (Chatrie et. al., 2000). Sektor Net, which began in 1994, cost €67 million up to the year 2000 (European Commission, 2000a) when between 80 and 100% of the schools involved had Internet access. The government initiative for providing schools with computer facilities provides the financial support for private schools while other schools have to supply it themselves. Another initiative, established in 1996, was concerned with the development of online courses. This prompted the setting up of Denmark's Virtual University, which is a partnership between the Danish government, universities and institutions of higher education. Again, there are a number of initiatives in place alongside these which encourage the development of ICT knowledge and use (Eurydice, 2001a). A programme, which will last for a three and a half year period was set up on January 2001. It has a budget of €46 million and has the general aim of providing teachers and pupils with the necessary skills and equipment for maximising their use of ICTs in all areas of education. (Chatrie et. al., 2000)

National, local and regional information society initiatives

Denmark ranks fifth among the countries of the EU in the 2000 information society index. Denmark launched its first national strategy for the information society in 1994 called the 'Info-Society 2000' white paper. This was developed further on an annual basis. Subsequent initiatives include:
IT Policy action Plan 1995: 'From Vision to action – Info-Society 2000'
IT Policy action Plan 1996: 'Info-Society for all-the Danish Model'
IT Policy White Paper 'Authorities heading for a fall' and IT-policy Action Plan 1997/1998: 'Action for Change'

Various sub-strategies and sectoral action plans have also been in place since 1996:
Electronic Commerce in Denmark-a national EDI action plan (1996) which is concerned with encouraging electronic communication between businesses and the public and private sectors;
'Freedom to Choose: Action plan for IT use by people with disabilities' (1996);
'Government National sub-strategy for IT research' (1997);
Danish strategy for the IT, Telecommunications and Electronics industries (1998);

The government reassessed its policies in Autumn 1999. The Committee for Digital Denmark published a paper on Danish IT strategy for the future entitled 'Digital Denmark: conversion to the network society'. As a response to this the Ministry of Research and IT published a paper outlining the initiatives to be put in place in 2000 entitled IT policy strategy: Realigning to a network society (December 1999). The initiatives put in place under this are quite numerous. Some of them include:
Development of a telecommunications infrastructure which Danes can use at a minimum cost including: a wireless subscription network; mobile access to the Internet; cheaper mobile phone costs
A code of fundamental rights for all citizens in relation to IT
Facilitating lifelong learning
Encourage and assist e-commerce and the development of a code of conduct with the end result of making Denmark a leading IT nation
24 hour digital administration facilitating contact between public authorities and citizens

Appendix Four - Finland

Socio-economic background

Finland has a total land area of 338,000 square kilometres (Eurostat, 2001a). With a population of 5.18 million and population density of 14 people per square kilometre (ITU, 2002). 66.7% of the population are residing in urban areas (UNDP, 2001). The Finnish GDP for 2000 was €25,440, 12.9% over the EU-15 weighted average (Eurostat, 2001b).

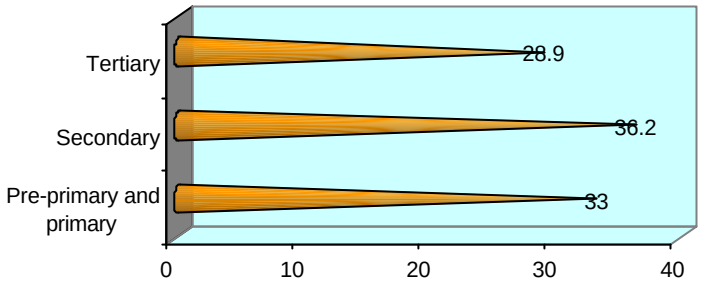


Figure A13: Public education expenditure by level (as % of all levels), 1995-97: Source: UNDP, 2001

12.2% of the governmental expenditure has been on public education. This is 7.5% of the GNP (UNDP, 2001). Total unemployment for 2000 was 11% (Eurostat, 2000b). The breakdown of employment per sector is as follows:

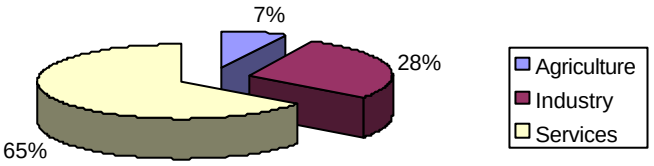


Figure A14: Total employment per sector, 1998: Source: Eurostat, 2000a

The main language spoken in Finland is Suomi (Finnish) with 4,700,000 (93.5% of the population) using it as the mother tongue (Ethnologue, 2002d). The three most commonly used second languages are English (49%), Swedish (35%) and German (13%) (West et. al. (Eds.), 2000).

Access to Technology

There were 72.1 mobile phone subscriptions per one hundred inhabitants in 2000 (Eurostat, 2002). In 1999 the number of PCs per one hundred inhabitants was 39, 21 of these were in homes while 18 were in businesses (ESIS, 2000a). Finland has its own computer driving licence (CDL) with over 100,000 people. They plan to convert to the ECDL (personal correspondence). Public Internet access points per one thousand inhabitants in 2001 was 0.46. The total number of graduates in science and technology as a percentage of twenty to twenty four-year-old people in 1997 was 5.3% (ESDIS 2001).

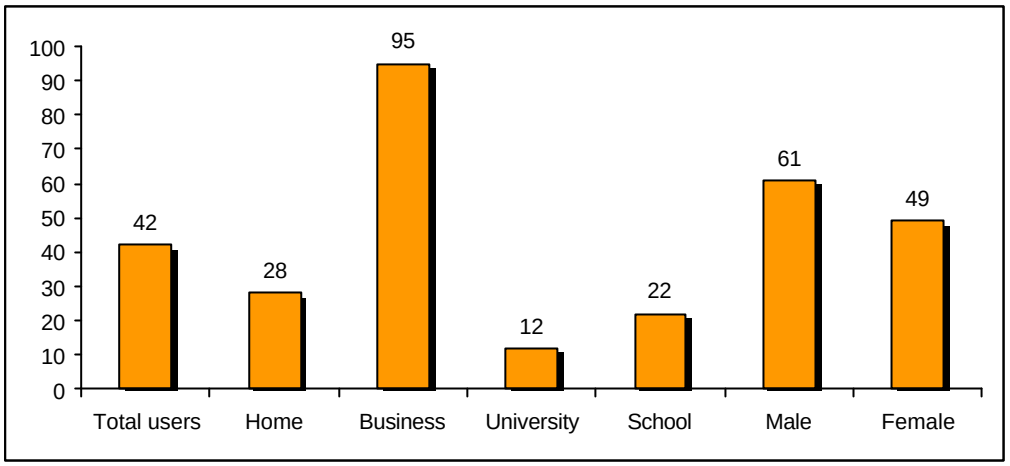


Figure A15: Total population with Internet access, location and gender (%), 1999/2000:Source: ESIS, 2000a, Hobley, 2001

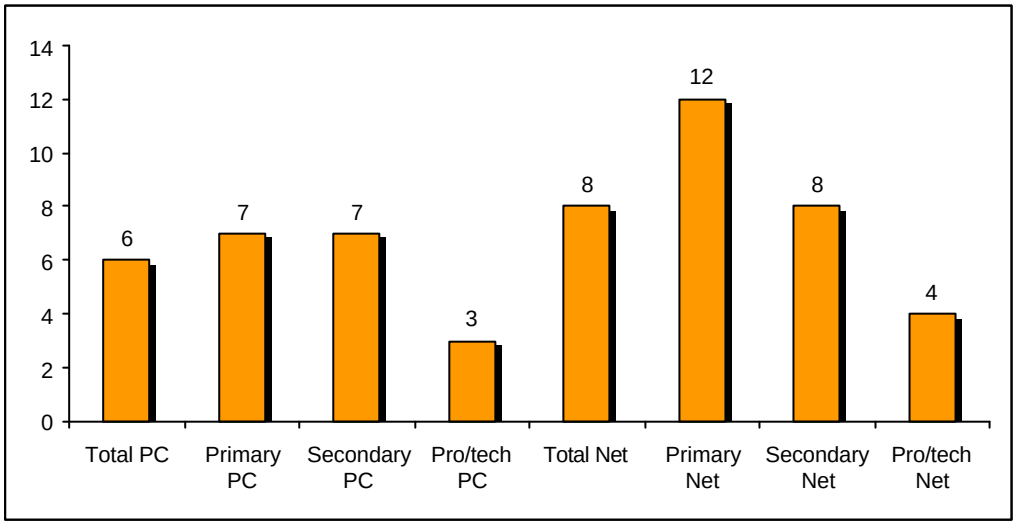


Figure A16: Pupils per PC/PC connected to the Internet, 2000: Source: eEurope, 2002a, Eurydice, 2001b

Extent of participation in Distance Education

Distance education was introduced into many of the existing higher educational institutions in the 1970s instead of establishing one specific institution. The Finnish Institution for Distance Education (FADE) was founded to coordinate cooperation at a national and international level. Students pay fees but the Ministry of Education provides partial subsidy. More than 15% of the 50,000 registered university students took part in distance education programmes (EADTU, 1998). Admission to distance taught courses is open and after completing 60 study units students can study at a university full time. The service is available country-wide.

Telecommunications regulation

An efficient communications market is a result of Finnish authorities' taking a hands-off approach, in comparison with the other member states, through placing greater emphasis on market forces rather than detailed regulation. Local telephone companies remain in control of local telecommunications. There is no evidence of any significant uptake of shared access to the local loop. New entrants into the market are dissatisfied with significant market entry barriers, which are a result of a light regulatory approach by the authorities in relation to the level of interconnection, numbering and pricing issues. This has, however, allowed the development of a competitive market in which the testing of and operating new products and

services is possible. Third generation licensing is progressing without much complaint. (European Commission, 2001b)

Provision of technology to the education system

Public/private partnerships in the area of provision of technology to education are not evident in Finland. In 2000 the Ministry for Education and Research published the plan for implementation of the national information strategy for education and research from 2000 – 2004 after previous national strategies were successful (European Commission, 2000a). Previous strategies concluded that the technological infrastructure in Finland was of a high standard but the use of ICTs in education was inconsistent and inadequate. As a result of this, this initiative focussed on: promotion of networks as a means of learning; accumulation of digital capital; strengthening of the infrastructure in the research and education sectors; and the development of the knowledge and skills needs in the information society (Eurydice, 2001a).

National, local and regional information society initiatives.

Finland is ranked second in the EU and third in the world by the 2000 information society index. The concept of information society type initiatives in Finland date back to the work done by the Information Society Advisory Board (1976-91). The Finnish Ministry of Finance compiled the first Information Society strategy in 1994 entitled 'Finland towards the Information Society - a National Strategy'. A number of initiatives were implemented during 1995 and 1996. These include:

- Sectoral information society programmes;
- The creation of the National Committee for Information Society;
- The establishment of the Information Society Forum;
- Local and regional authorities launched their own initiatives;
- Launch of the Multimedia programme;
- The launch of the Finnish ECDL, the CDL;

The revision of the national strategy began in 1997. A new strategy was drawn up on December 1998 entitled 'Quality of Life, Knowledge and Competitiveness'. Four areas summarise this new approach: focus on people; decentralisation; adaptation; co-operation. Seven themes for development were of particular interest to this programme.

- Culture and information products and services – e.g. digitalisation of major archive and library materials
- Electronic transaction and service process – e.g. construct development projects in the area of electronic transactions and trade, and promote synergy and coherent services
- Personal navigation – develop an entity of services for personal navigation supporting all forms of mobility
- Electronic learning environments
- Knowledge intensive work
- Business networking and teleworking
- Develop the information society at a local level

These were developed further in 1999 and implementation began in 2000. The projects set up under this new approach include:

- The E-government project-JUNA (1999-2002)
- Macro Pilot project, which generally aimed to develop a seamless and efficient healthcare and social service system and improve data security and privacy
- Information Society strategy for the Ministry of Transport and Communications

Finally, the Information Society Advisory Board released a report entitled 'Finland as an Information Society' in June 2000. It outlined all of the positive advancements made by Finland but also proposed measures which will shape the next generation of initiatives. These include the strengthening of education, know-how and research; further development in the communications infrastructure such as further liberalisation of the telecommunications market and increased availability of ICT services; and measures to prevent alienation within the information society (Chatrie et. al., 2000).

Appendix Five - France

Socio-economic background

France is 544,000 square kilometres in size (Eurostat, 2001a). It has a population of 58.89 million with a population density of 108 people per square kilometre (ITU, 2002). The urban population as a percentage of the total is 75.4% (UNDP, 2001). French GDP for 2000 was €23,250, 3.2% above the EU-15 weighted average (Eurostat, 2001b).

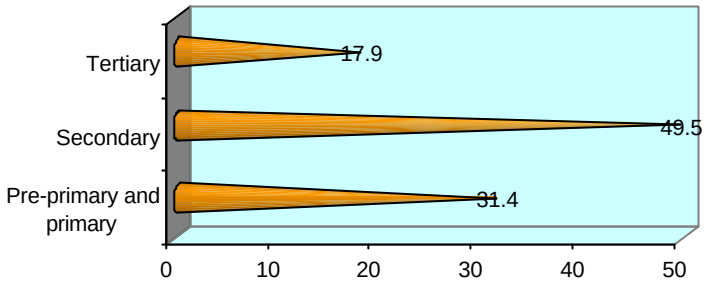


Figure A17: Public education expenditure by level (as % of all levels), 1995-97: Source: UNDP, 2001

Governmental expenditure on public education was 10.9% of the total expenditure between 1995 and 1997. This was 6% of the GNP for the same period (UNDP, 2001). The rate of unemployment for 2000 was 9.6%. The division of employment per sector is as follows:

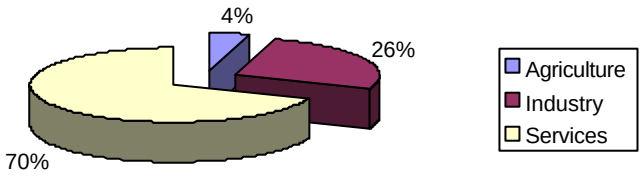


Figure A18: Total employment per sector, 1998:Source, Eurostat, 2000a

Next to French, the three most commonly spoken second languages are English (32%), Spanish (11%) and German (9%) (West et. al. (Eds.), 2000).

Access to Technology

There were 49.1 mobile phone subscriptions per one hundred inhabitants in 2000 (Eurostat, 2002). In 1999 the number of PCs per one hundred inhabitants was 31, 19 of these were in homes while 12 were in businesses (ESIS, 2000a). The number of European Computer Driving Licence skill cards, which includes the figure for Luxembourg, issued by the end of December 2001 was 30,760 (personal correspondence). Public Internet access points per one thousand inhabitants in 2001 was 0.03. There are plans to expand overall numbers from 1,603 to 7,000. The total number of graduates in science and technology as a percentage of twenty to twenty four-year-old people in 1997 was 4.3% (ESDIS 2001).

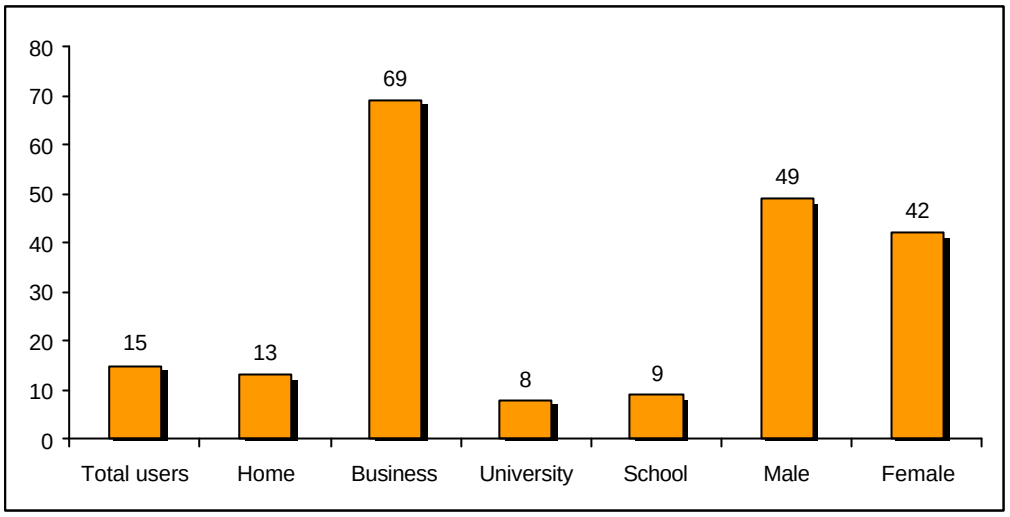


Figure: A19: Total population with Internet access, location and gender (%), 1999/2000: Source: ESIS, 2000a, Hobley, 2001

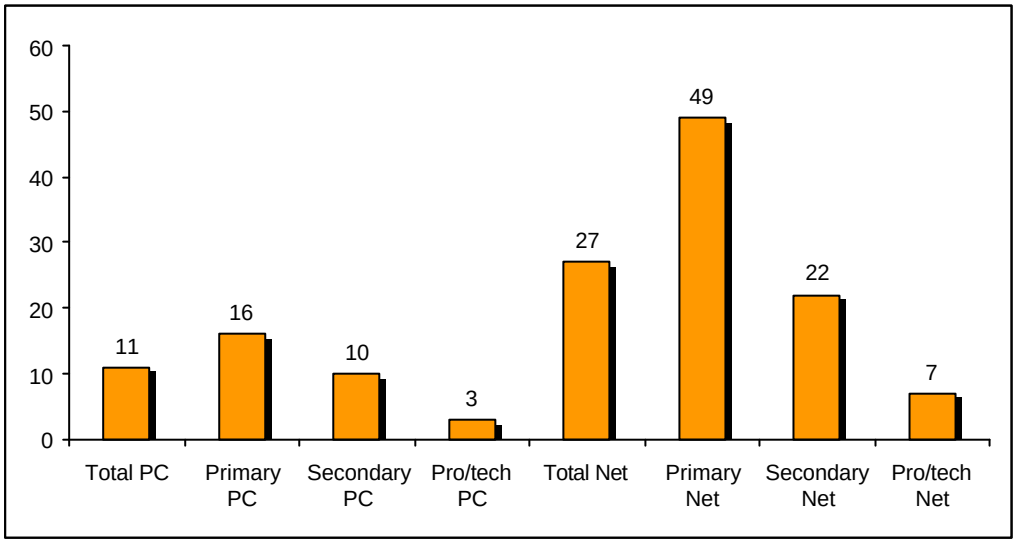


Figure A20: Pupils per PC/PC connected to the Internet, 2001:Source: eEurope, 2002a, Eurydice, 2001b

Extent of participation in distance learning

Created in 1939, the Centre National d'Enseignement à Distance (CNED) was the first distance education institution in Europe. It coordinates eight training and production units throughout the French territories. It is a very well developed institution with an audio-visual centre with a recording studio capable of the most advanced digital production and post-production capable of direct satellite transmissions. CNED are also developing an electronic platform 'of training and educational services, accessible via telematics' (EADTU, 1998). With 360,000 registered students, registration fees provide 75% of the CNED budget while the remaining 25% is provided by the French Ministry of Education. CNED provides preparation courses to 215 university degrees and has signed partnership agreements with 82 higher education institutions.

Telecommunications regulation

France has experienced substantial growth in all sectors, particularly in data and mobile communications, as a result of positive regulatory developments in 2000. The mobile sector market penetration, at 58%, is coming close to the EU average with mobile lines now exceeding the number of fixed lines. Despite this growth, attempts to open up the markets by

the regulator have been unsuccessful. Only 1% of the population has a choice of local access service provider. There are not many opportunities for new arrivals to get a foothold in the market as a provider of a full range of services as they cannot compete with France Télécom. In July 2001 France took a step towards completing the transposition of the EU telecommunications regulatory framework into French law. An adoption of a number of implementation measures is now required (European Commission, 2001b).

Provision of technology to the education system

There are a large number of public and private partnerships in place for the provision of and training in the use of ICTs in education. The use of ICTs in assisting both teaching and learning dominate the initiatives in France. There are, however, some which deal with the provision of PCs and Internet connections. In November 1997 a plan was launched with the aim of providing all teachers, students and classes with an email address in the year 2000. As a result, 'numbers of Internet connections doubled in six months and by the end of June 1998 80% of higher secondary schools had a connection' (European Commission, 2000a). Initiatives in place since 1998 have seen the numbers of students per computer decrease dramatically. For example, the average number of pupils per computer in colleges fell from 17.5 in December 1998 to 14.6 in March 2000. Internet access, which was available to 5% of all schools in 1998, increased to 35% by March 2002. The government has allocated €9.91 million to maximise the number of schools that have Internet access. The establishment of a high capacity Internet network for research and education, which will have 16 times the capacity of its predecessor will be operational by the end of 2002. From the end of the 2001 academic year a scheme for connecting 150,000 student rooms within the colleges to the Internet was put in place (Eurydice, 2001a).

National, local and regional information society initiatives.

France ranks tenth in the EU in terms of information society development. Several information society initiatives under the 'Information Highway and Services' initiative were implemented prior to 1997, which resulted in 244 information highway experiments being set up. There was still a lag in the development of a national strategy. On January 1998 the government released its action plan to 'Prepare the entry of France in the Information Society' (PAGSI). It identified six areas of priority namely: education; culture; public services; companies; industrial and technological innovation; and regulatory framework. An inter-ministerial committee for the information society was set up as it was decided that all public administrations at a national and local level would be involved instead of creating a new body in charge of ICT.

Seventy percent of the objectives set in 1998 had been reached by the beginning of 1999. The areas, which were developed under this programme, and a brief example of what was done will be outlined below.
Education: these have been dealt with in some detail above. One, which was not mentioned, was the establishment of three educational websites. EDUNET is a site dealing with ICTs in education. EDUCASOURCE is concerned with electronic resources for education. Finally, EDUCLIC is a portal site for education professionals.
Culture: ninety-eight 'Multimedia Culture Centres' were set up.
Government Departments: Sites containing public data were set up. Remote access services were started.
E-commerce: The state established a number of initiatives to increase awareness on the possibilities of e-commerce among companies.
Innovation and research: Through the development of risk-capital finance and extending fiscal measures in the finance laws to encourage new entrepreneurs in the new technology sector, industrial and technological research was strongly encouraged.
Regulation: an example of this is the fact that the government has begun liberalising the use of encryption methods.

In order to reduce social disparities the governments' Information Society policy from 1999/2000 focused on:
Education; Internet access for all; New jobs and ICT training; ICT and the third sector; The unbundling of the local loop; International cooperation (north/south); New measures for e-Europe; and Research and development for new ICT applications (Chatrie et. al., 2000).

Appendix Six - Germany

Socio-economic background

Germany has a total population of 82.26 million with 230 people per square kilometre (ITU, 2002). The country is 357,000 square kilometres in size (Eurostat, 2001a) and 87.3% of the population lives in urban areas (UNDP, 2001). The GDP for 2000 was €24,640, 9.4% above the European weighted average (Eurostat, 2001b).

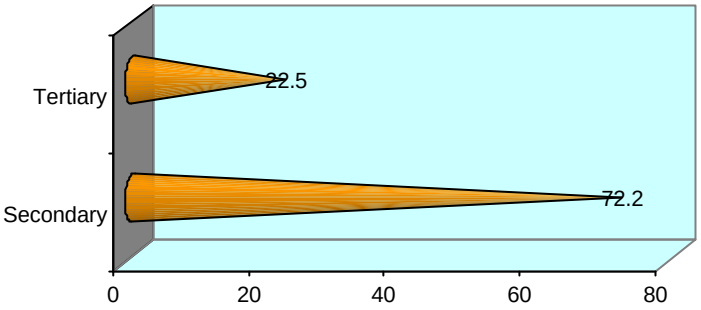


Figure A21: Public education expenditure by level (as % of all levels), 1995-2000: Source: UNDP, 2001

Investment in public education was 9.6% of government total expenditure which is 4.8% of the GNP (UNDP, 2001). Figures for the expenditure on pre-primary and primary between 1995 and 1997 are not available, but are for secondary and tertiary. Unemployment in Germany was at 8.1% by the fourth quarter of 2000 (Eurostat, 2000b). Employment by sector for 1998 is:

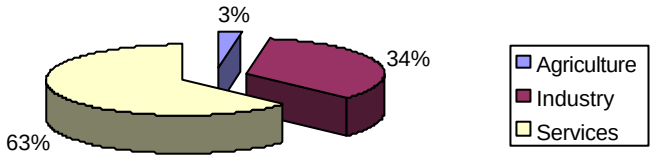


Figure A22: Total employment per sector, 1998: Source: Eurostat, 2000a

Next to German, the three most commonly spoken second languages are English (41%), French (11%) and Russian (4%) (West et. al. (Eds.), 2000).

Access to Technology

There were 58.7 mobile phone subscriptions per one hundred inhabitants in 2000 (Eurostat, 2002). In 1999 the number of PCs per one hundred inhabitants was 36, 23 of these were in homes while 13 were in businesses (ESIS, 2000a). The number of European Computer Driving Licence skills cards issued by the end of December 2001 was 94,429 (personal correspondence). Public Internet access points per one thousand inhabitants in 2001 was 0.06. The total number of graduates in science and technology as a percentage of twenty to twenty four-year-old people in 1997 was 3.2% (ESDIS 2001).

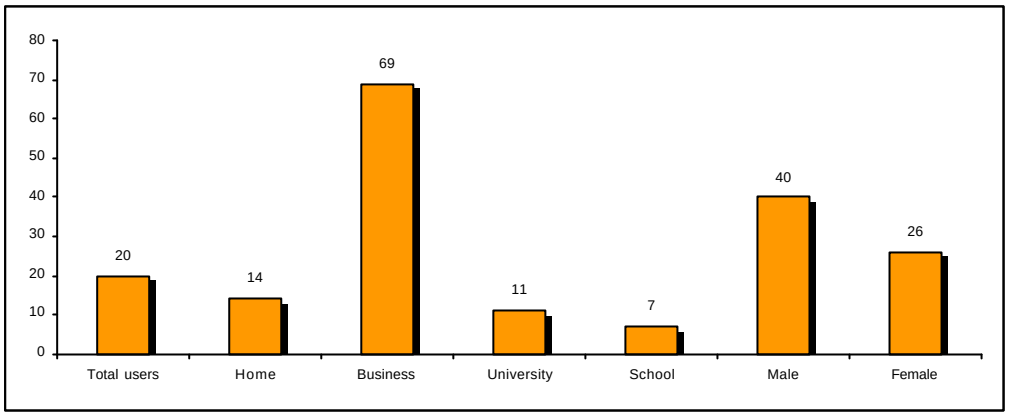


Figure A23: Total population with Internet access, location and gender (%), 1999/2000: Source: ESIS, 2000a, Hobley, 2001

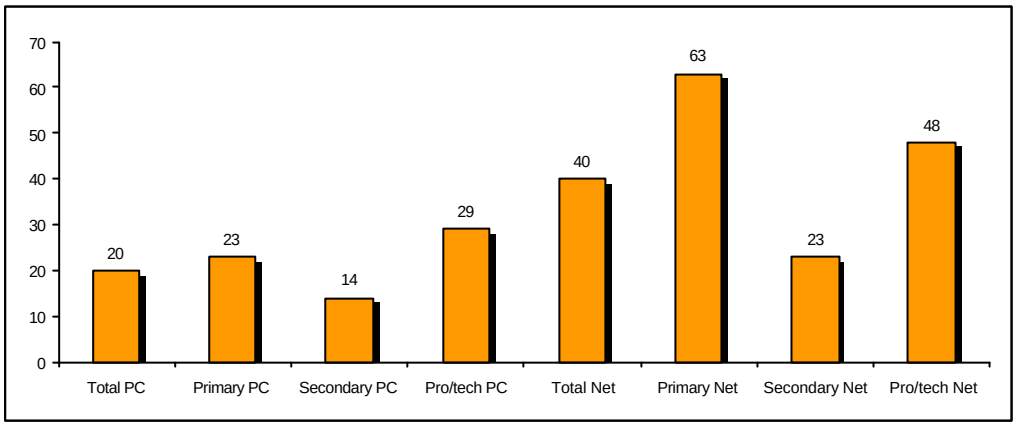


Figure A24: Pupils per PC/PC connected to the Internet, 2001: Source: eEurope, 2002a, Eurydice, 2001b

Extent of participation in distance learning

The FernUniversität was established in 1974. It is 100% state funded. In 1996 the number of students registered was 55,450. Entry requirements are similar to the national universities. The total number of study centres amounts to sixty-four (EADTU, 1998).

Telecommunications regulation

Germany has been actively opening up the telecommunications market since 1998 with the establishment of new laws, issue of over five hundred telecommunications licences, reducing telephone and Internet charges, and introducing new end user equipment and multi-media services (Chatrie et. al., 2000). Germany has witnessed a substantial rise in the number of new operators in the market. Despite this, the incumbents, Deutsche Telekom (DT) share is still quite high in many areas of the market. The need for high speed services in this innovative and rapidly developing market is being met by DT. New entrants can only supply a fraction of what is being offered. Where local loop provision is concerned, competition is developing quite favourably. All other areas, such as third generation provision, interconnection, unbundling etc. all appear to be developing at an impressive rate (European Commission, 2001b).

Provision of technology to the education system

Coinciding with the number of initiatives put in place, outlined below, the industrial sector has helped to provide 20,000 schools with ICT facilities. The federal initiative Schulen ans Netz (developed with Deutsche Telekom) allowed the equipment and connecting of over 8,000 schools with 5,000 more to come 'subject to the assembly of local and regional funding' (European Commission, 2000a). Overall, DT has provided both free Internet access

and 20,000 computers. An association, comprising 120 firms, is assisting in the provision of computer-related infrastructure as well as preferential rates. The qualified staff from within these firms are also acting as free consultants to the schools. The 'Schools On Line' initiative was launched in 1996. Under this initiative, the federal government and DT provide schools with free Internet connections including their installation and monitoring. The programme to modernise vocational educational institutions is centred on the provision of ICT facilities and is implemented by the Ministry for Education and Research. Another governmental initiative supplied half of public libraries with in the country with secure Internet access. In 2000 the federal government allocated €83.34 million to provide computer facilities, the establishment of communication networks in higher education institutions and the extension of opportunities in training in computer science (Eurydice, 2001a).

National, local and regional information society initiatives

Germany ranks sixth in the EU according to the 2000 information society index. 'Info-2000: Germany's way to the Information Society', released in 1996, was the first action plan concerning this area by the Federal Government. They recognised that a 'comprehensive action effort was needed' to support the information society through further liberalisation of the telecommunications market and the creation of 'uniform national legal conditions for the use and supply of ICTs' (Chatrie et. al., 2000). The action plans were all based around this notion. Between 1996 and 1998 many changes in public policy resulted in the opening of the telecommunications market. November 1999 saw the launch of a new action programme of the Federal Government entitled 'Innovation and Jobs in the Information Society of the 21st Century'. Within this, four strategic fields of action were outlined: 'ensuring broad access to the new media and providing media competence; increasing the confidence of suppliers and users with security legislation; promote state modernisation; shaping change together' (Chatrie et. al., 2000). Coinciding with these were ten general aims to be accomplished by 2005:

- wider access to media
- access for all groups
- consumer protection
- modernisation of school and vocational training systems
- Research and development
- Lead in technology and infrastructure
- Work organisation, innovation jobs and companies
- Ecology and sustainability
- Modernise the state through e-government
- European and international cooperation.

Examples of initiatives implemented under this action plan are 'Internet for all' which includes:

- Actions targeted at women and girls
- Actions targeted at seniors
- The Internet prize (an annual award by public/private partnership)
- 'Germany 21- Entering the Information Age' (employers encouraging cross-sectoral initiatives to encourage the move from an industrial to information Economy)
- The establishment of an 'Information Society Forum' in 1999.
- 'The Alliance for Jobs, Training, and Competitiveness and the Green Card Initiative'.

There were also a number of initiatives implemented at a regional level by the Länder Governments:

- Baden-Württemberg media-perspectives for the development of the media in the state of Baden-Württemberg.
- Bayern Online- an information society programme of the Bavarian state government.
- Brandenburg's Information Strategy 2006 (BIS 2006).
- Bremen's Regional Information Society Strategy Development (BRISE).
- Initiative Information Society Schleswig-Holstein.
- The Berlin way towards the Information Society.
- Media NRW - an initiative of the state of northRhine-Westphalia (Chatrie et. al., 2000).

Appendix Seven - Greece

Socio-economic background

Greece has a total area of 132,000 square kilometres (Eurostat, 2001a). With a population of 10.65 million there are 81 people per square kilometre (ITU, 2002). 59.9% of the population live in urban areas (UNDP, 2001). Greek GDP for 2000 was €11,660. This is 48.2% below the EU-15 weighted average (Eurostat, 2001).

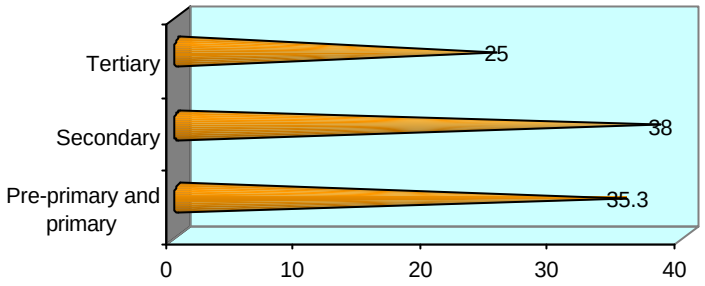


Figure A25: Public education expenditure by level (as % of all levels), 1995-97: Source, UNDP, 2001

8.2% of the total government expenditure was on public education between 1995 and 1997, 3.1% of GNP for the same period (UNDP, 2001). Unemployment was at 11.1% for the fourth quarter of 2000 (Eurostat, 2000b). The breakdown of employment per sector is (Eurostat, 2000a):

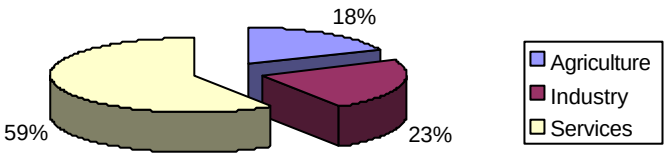


Figure A26: Total employment per sector, 1998: Source, Eurostat, 2000a

The national language is Greek. The next three most commonly spoken languages are English (38%), French (7%) and German (5%) (West et. al. (Eds.), 2000).

Access to Technology

There were 56.3 mobile phone subscriptions per one hundred inhabitants in 2000 (Eurostat, 2002). In 1999 the number of PCs per one hundred inhabitants was 11, 1 of these were in homes while 10 were in businesses (ESIS, 2000a). The number of European Computer Driving Licence skills cards issued by the end of December 2001 was 16,886 (personal correspondence).

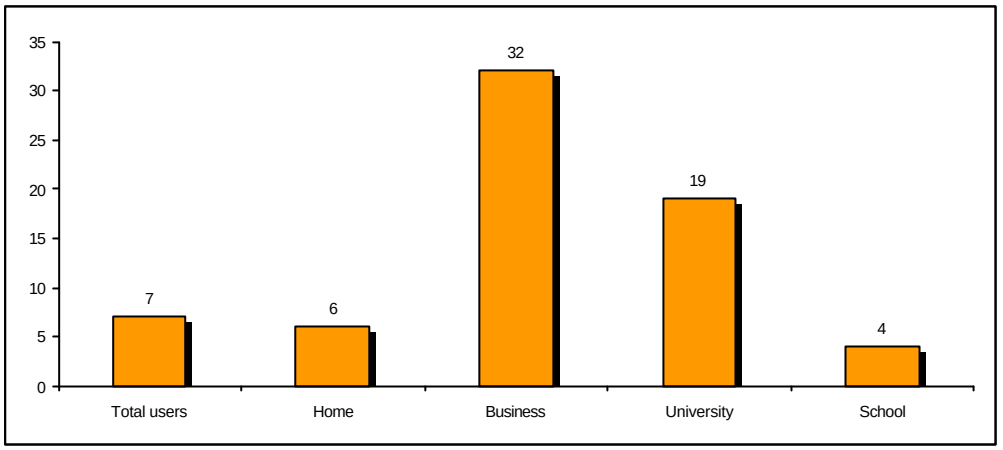


Figure A27: Total population with Internet access and location, 1999/2000: Source, ESIS, 2000a, Hobley, 2001

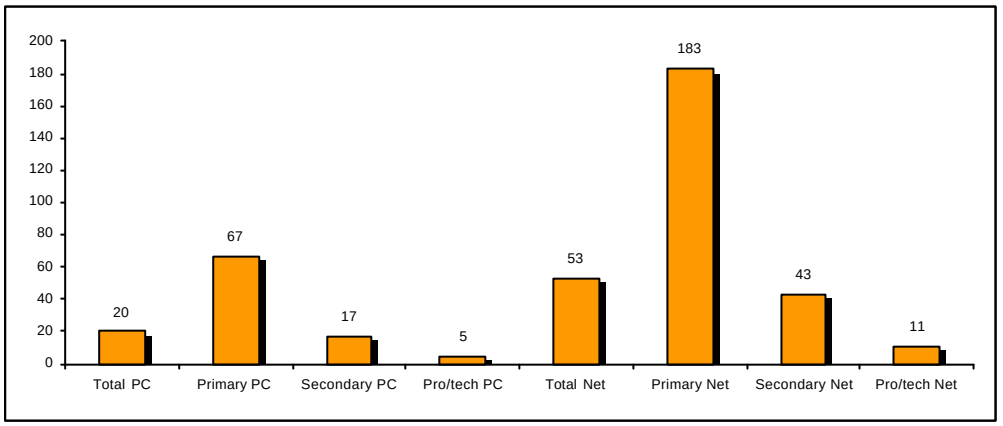


Figure A28: Pupils per PC/PC connected to the Internet, 2001: Source: eEurope, 2002a, Eurydice, 2001b

Extent of participation in distance learning

The Hellenic Open University (HOU) was established as a legal entity in 1997. It was created as a largely second generation distance learning operation as a result of the poor Greek access to ICTs. The headquarters HOU is located in Patras. It is mainly funded by the EU and by the Education Ministry and student fees. Any Greek student can enrol but the ability to attend face-to-face tutorials is regarded as important. There are three centres in total. These are in Patras, Athens and Thessaloniki. The total number of students enrolled to date is 20,000 (personal correspondence within HOU). The first graduates are now graduating from an MA TEFL programme.

Telecommunications regulation

On 1 January 2001 the Greek telecommunications market was fully liberalised. Under new telecommunications law power was transferred from the Ministry of Transport and Communications to a national regulatory authority (EETT). It is believed that the EETT have brought 'legal certainty and clarity'. They have taken substantial measures in addressing issues such as interconnection, the introduction of 3G, a new numbering plan, local loop unbundling etc. Problems still remain in the areas of the price of leased lines, shared access in unbundling the local loop, interconnection issues and the promotion of broadband Internet services (European Commission, 2001b).

Provision of technology to the education system

In the area of primary education there is one main initiative in Greece. As well as providing training and a database for teachers and trainee teachers the Island of Phaeakes Programme aims to have one computer available for every twelve students by 2006. Under the Odysseia

programme, which ran between 1996 and 2000, 400 high schools were provided with computer laboratories. At a tertiary level, the major objective is to have a high capacity network available to students and teaching staff at universities. One of the initiatives concerning special education in Greece has the goal of providing computer laboratories for the schools and the setting up of ten pilot pre-vocational laboratories. Also within this is the extension of existing databases for centres concerned with disabled children (Eurydice, 2001a). More measures for the provision of technology to the education system are mentioned below within the 'Operational Programme for the Information Society'.

National, local and regional information society initiatives.

Greece is well behind other European countries in terms of its position in the information society index. The first paper released related to the topic was the white paper 'Greek Strategy for the Information Society: A tool for Employment, Development and Quality of life' in 1995. This was to encompass four goals to be attained over a ten to fifteen year period. These were: to increase the use of advanced information infrastructure in order to limit the gap between Greece and its partners and to reach international standards; to prepare Greek firms to adopt ICTs; to enable an increasing number of citizens to have access to information infrastructure; and to encourage electronic transactions with public administrations – eGovernment. This was the foundation for many initiatives to be implemented between 1999 and 2000:

- Klisthenis Programme: concerned with the modernisation of public administration
- The National Land Registry: with the goal of compiling a complete land registry by 2010
- Ministries on the web: the development of ministerial websites.
- Teletraining pilot project for teachers
- Initiatives for the development of educational material and software
- Development of Research Networks
- Ecommerce initiatives
- Development of telemedicine
- EPPOS programme of the Ministry of Culture and Sports
- Athens 2004 programme: will use ICTs to promote the Olympic Games

In February 1999 the Greek Government released its second white paper entitled 'Greece in the Information Society: strategies and Actions'. This paper outlined a detailed strategy for the future which included definite goals, initiatives and methods for achieving the goals. Ten major objectives are defined (Chatrie et. al., 2000):

- Open and effective government
- An education system for the 21st Century
- Economic growth based on new technologies
- Improved job opportunities and skills for the workforce
- A better quality of life
- The promotion of Greek culture and civilisation
- The use of new technologies in mass media
- Regional participation in the information society
- Development of the national communications infrastructure
- Protecting citizens' rights in the information society

The implementation of these objectives was outlined in the 2000 paper entitled 'Operational Programme for the Information Society' (OPIS). Within this it is stated that €2.3 billion will be made available for this implementation over seven years. Definite measures to be implemented include:

- All secondary schools to be provided with IT equipment and network connections
- 1,400 high schools and 430 technical institutions provided with Internet connections
- Improve services and communication in public administration
- Provision of facilities for online VAT declaration submission
- Law texts and basic administrative applications to be made available online by every administration.
- Expansion of eCommerce to be achieved through the reform of the legislative environment.
- Qualify employees in public administration by developing IT training programmes in public administrations. (Chatrie et. al., 2000)

Appendix Eight - Ireland

Socio-economic background

Ireland is 69,000 square kilometres in size (Eurostat, 2001a). With a population of 3.79 million there are approximately 55 people per square kilometre (ITU, 2002). 58.8% of the population lives in urban areas (UNDP, 2001). Irish GDP for 2000 was €27,320 this is 21.3% above the EU-15 weighted average (Eurostat, 2001b).

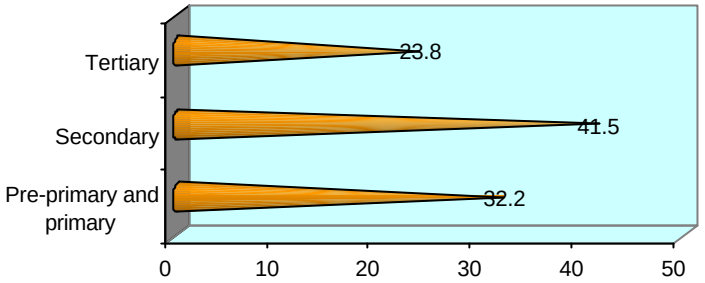


Figure A29: Public education expenditure by level (as % of all levels), 1995-97: Source: UNDP, 2001

Government spending on public education for the period 1995 to 1997 amounted to 13.5% of the total government spending. This is 6% of the countries GNP for the same period (UNDP, 2001). Unemployment in Ireland was at 4.4% by the fourth quarter of 2000 (Eurostat, 2000b). Employment by sector for 1998 is:

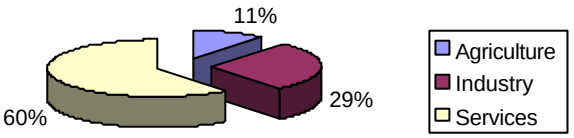


Figure A30: Total employment per sector, 1998: Source: Eurostat, 2000a

Next to English, the three most commonly spoken second languages are Irish (13%), French (12%) and German (4%) (West et. al. (Eds.), 2000).

Access to Technology

There were 65.9 mobile phone subscriptions per one hundred inhabitants in 2000 (Eurostat, 2002). In 1999 the number of PCs per one hundred inhabitants was 18, 7 of these were in homes while 11 were in businesses (ESIS, 2000a). The number of European Computer Driving Licence skills cards issued by the end of December 2001 was 160,658 (personal correspondence). Public Internet access points per one thousand inhabitants in 2001 was 0.16. The total number of graduates in science and technology as a percentage of twenty to twenty four-year-old people in 1997 was 4.2% (ESDIS 2001).

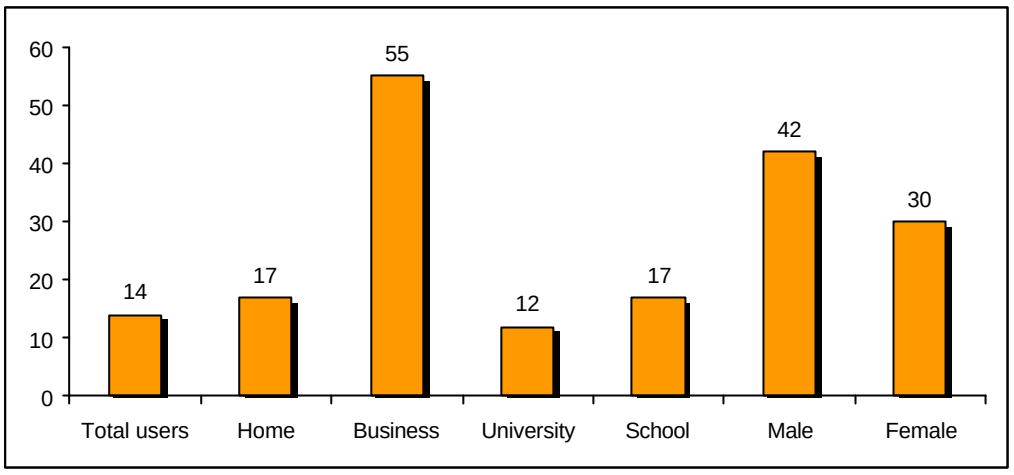


Figure A31: Total population with Internet access, location and gender (%), 1999/2000: Source: ESIS, 2000a, Hobley, 2001

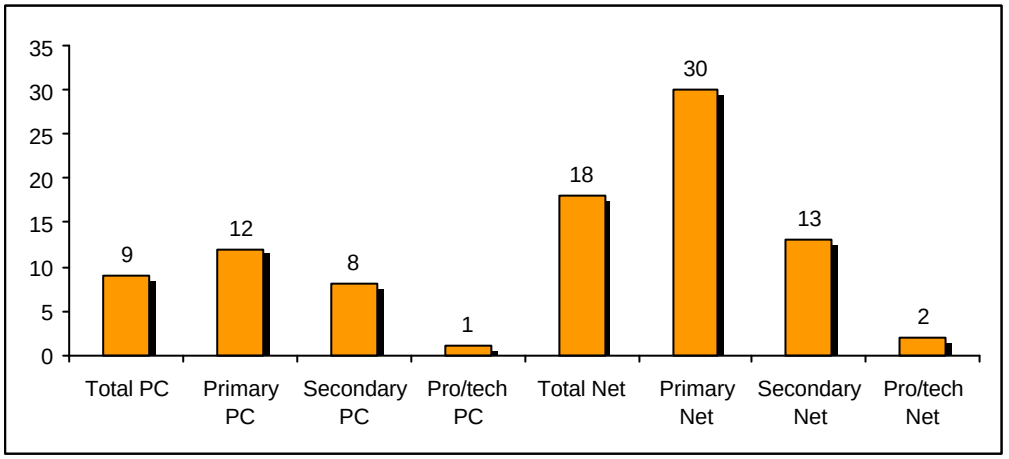


Figure A32: Pupils per PC/PC connected to the Internet, 2001: Source: eEurope, 2002a, Eurydice, 2001b

Extent of participation in distance learning

The National Distance Education Centre (NCDE) was established in 1982. It receives an annual grant of €697,000 from the Higher Education Authority. 65% of income is derived from student fees. 3,550 students were registered in the academic year 2002. Students over 23 years of age are eligible to enrol on undergraduate programmes. Students under 23 must have matriculated in the secondary leaving certificate. There are more than forty study centres in operation (EADTU, 1998).

Telecommunications regulation

Despite an increase in the number of new entrants into the market, both fixed and mobile, Ireland is still lagging behind. No local loops have been unbundled to date. The Irish government is to invest €300 million to build 50,000 kilometres of high speed, fibre optic access rings around 123 of its towns and cities (DDN, 2002). The 3G roll out is sluggish. The provision of leased lines is of concern to new entrants in connection to both delivery time and prices. Ireland rates poorly in this area in comparison to the other member states. The national backbone project aims to provide the country with a more widely available broadband network. 2002 will see some important changes to legislation. A new body The Commission for Communications Regulation, will be established to respond to the evolution of telecommunications markets. The Office of the Director of Telecommunications Regulation will be transferred into this (European Commission, 2001b).

Provision of technology to the education system

Within Ireland a large part in the provision of technology to the education system is played by public/private partnerships, many of which are formed under the School Integration Project (SIP). As a part of the Schools IT 2000 project, launched in 1997, the incumbent telecommunications company, Eircom, has provided each primary and secondary school with much of the essential ICT technology needed. They supplied a telephone line with Internet access and the necessary Internet service, which has free Internet access for five hours per week, and an Internet ready multimedia computer to the state's 4,100 schools. Government investment in the provision of ICTs for schools is to amount to €153.64 million by the end of 2002. Practically all of the schools have been connected to the Internet, while 60,000 computers were supplied to schools by the end of 1999 (Mac Keogh, 2001, 228).

Initiatives, concerned with technology provision, at the higher education level are in the area of advanced academic telecommunications. The education technology fund, established in 1997, provided over €317.43 million. HEA.NET Ltd manages two other projects in this area for the state. This company provides Internet connections and related services to the universities, institutes of technology and other organisations such as the national library. HEA.NET hope to use the national backbone project as a way to connect the third level institutions to a high speed network. Under the national development plan (2000-2006), the government has the aim to provide next generation Internet access to all of the institutions in the third level sector (Eurydice, 2001a).

National, local and regional information society initiatives

In March 1997 the Information Society Steering Committee (established in March 1996) published a report entitled 'Information Society Ireland: Strategy for Action'. This report proposed strategies by which Ireland could use ICTs to transform the economy and society. A number of measures were outlined as to how this could be obtained:

- The establishment of a strong and independent office for the telecommunications sector
- The provision of a broadband service to households and businesses
- The development of a centre of excellence for the creation, provision and export of content for the Information Society and encourage similar regional centres
- Develop Dublin as a 'virtual city flagship'
- The establishment of a National Learning Initiative
- Create the legal framework for an information society
- The establishment of an Information Society Commission (ISC) (Chatrie et. al., 2000).

In May 1997 the ISC was appointed for an initial three-year period. It was to advise the government, conduct research and benchmarking, and promote general awareness and understanding of ICTs among the general population and businesses. A proposal for the implementation of above mentioned strategy was released by 'The Inter-Departmental Implementation Group on the Information Society' called 'Implementing the Information Society: A Framework for Action'. It contained a proposed action plan concerning the following: telecommunications infrastructure; development of e-commerce and business opportunities; enabling and legislative measures; ICTs and delivery of public services; and support measures for areas in need of action. With reasonably high awareness of ICTs in Ireland being reached it was realised that action had to be taken to encourage widespread and speedy adoption of ICTs generally.

'Implementing the Information Society: An Action Plan' was published in January 1999. It provided a comprehensive and co-ordinated approach for the five main areas, which were mentioned above. A €38 million information society fund was provided in 2000. Annual progress reports are published by the Inter-Departmental Implementation Group. Some of the developments in the key areas are as follows (Chatrie et. al., 2000):

- Awareness:
- e-business and Internet strategies by state sponsored bodies

- e-business information and education campaign aimed at small to medium enterprises (SMEs)
- e-Ireland Internet site produced
- Infrastructure and connectivity
    - Broadband connection to the US and Europe established
    - Plans to widen the broadband competitiveness and to deliver broadband infrastructures to nineteen towns and eventually sixty-seven by Forfás
    - Setting up of 'Information Towns' (Ennis)
- Legislation:
    - eCommerce bill, July 10 2000
    - Regulations for the roll out of digital services
    - The broadcasting bill
- Training and Research and Development
    - Provision of €2.48 billion for research and development.
    - Establishment of MediaLab Europe (MLE)
    - IT training courses for farmers
- Access
    - Investment in PCs and Internet connections for libraries
    - Internet kiosks in social welfare offices
    - Fast track to Information Technology (FIT) action plan which provides employment for the unemployed in the IT industry to address IT skills shortages.
- Interactive service provision
    - 'Job Bank' established in 2000 to provide information on the availability of jobs
    - Online filling of tax returns
    - Land registry electronic access service.

Appendix Nine – Italy

Socio-economic background

Italy is 301,000 square kilometres in size (Eurostat, 2001a). The total population, with 66.9% living in urban areas (UNDP, 2001), amounts to 57.30 million. The population density is approximately 190 people per square kilometre (ITU, 2002). Italian GDP for 2000 was €20,190 this is 10.4% below the EU-15 weighted average (Eurostat, 2001b).

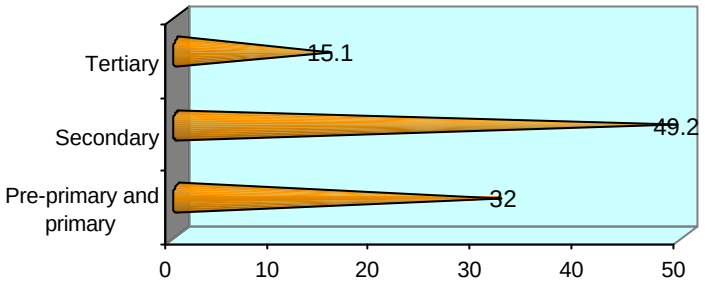


Figure A33: Public education expenditure by level (as % of all levels), 1995-97: Source: UNDP, 2001

Government spending on public education for the period 1995 to 1997 amounted to 9.1% of the total government spending. This is 4.9% of the countries GNP for the same period (UNDP, 2001). Unemployment in Italy was at 10.8% by the fourth quarter of 2000 (Eurostat, 2000b). Employment by sector for 1998 is:

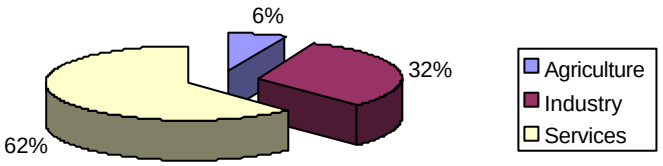


Figure A34: Total employment per sector, 1998: Source: Eurostat, 2000a

Next to Italian, the three most commonly spoken second languages are English (27%), French (19%) and Spanish (4%) (West et. al. (Eds.), 2000).

Access to Technology

There were 73.2 mobile phone subscriptions per one hundred inhabitants in 2000 (Eurostat, 2002). In 1999 the number of PCs per one hundred inhabitants was 20, 9 of these were in homes while 11 were in businesses (ESIS, 2000a). The number of European Computer Driving Licence skills cards issued by the end of December 2001 was 222,816 (personal correspondence). The total number of graduates in science and technology as a percentage of twenty to twenty four-year-old people in 1997 was 1.2% (ESDIS 2001).

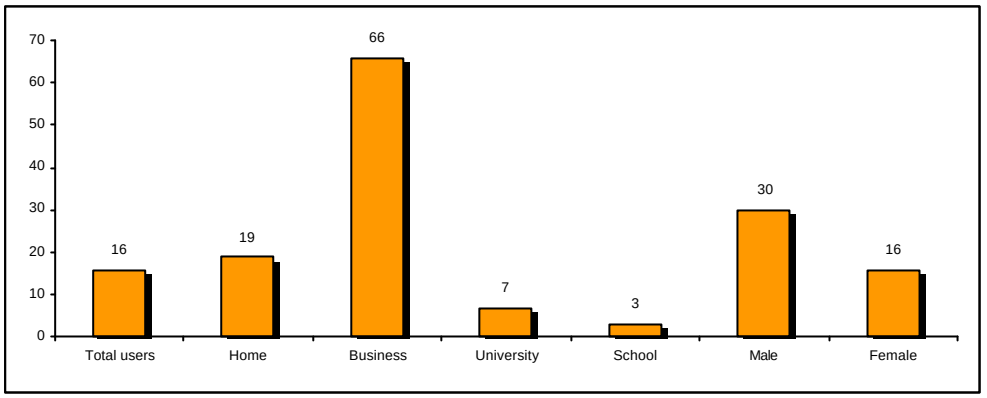


Figure A35; Total population with Internet access, location and gender (%), 1999/2000: Source: ESIS, 2000a, Hobley, 2001

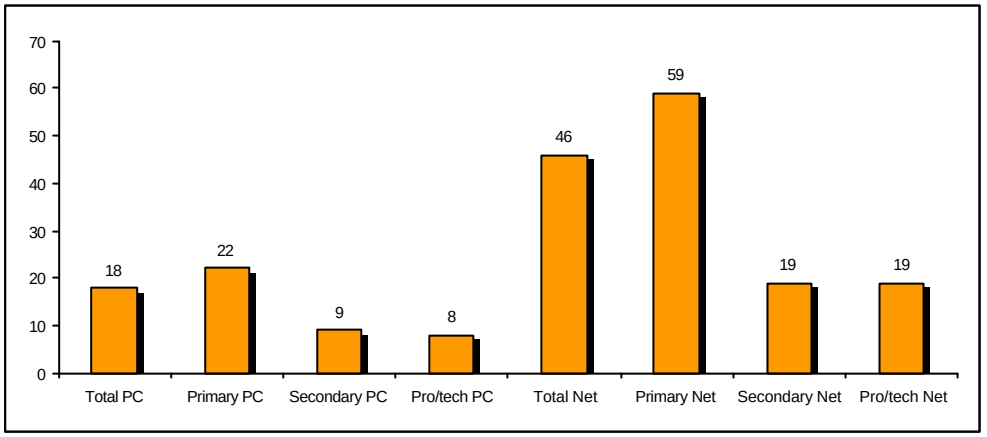


Figure A36: Pupils per PC/PC connected to the Internet, 2001: Source: eEurope, 2002a, Eurydice, 2001b

Extent of participation in distance learning

NETTUNO was established in 1990. It has three main income sources. These are from the Ministry of Education, student fees and revenues derived from participation in educational, research and development projects. Courses are open to anybody who holds a secondary school diploma. The number of students registered is 12,000. There are 38 public universities offering distance learning (Personal correspondence within NETTUNO).

Telecommunications regulation

Telecom Italia's share in the market has been decreasing gradually. This is as a result of a number of interventions put in place by the regulator. These have improved effective implementation, simplified administrative procedures and removed bottle-necks for new entrants. There is a well-established regulatory regime for local loop unbundling. Despite granting five 3G licences, two of which were given to new entrants into the mobile market, the prospects for commencement remain uncertain. Tariffs and cost accounting has been improving. There is little competition in the area of leased lines but the prices are decreasing significantly (European Commission, 2001b).

Provision of technology to the education system

Public/private partnerships have been established in Italy. Radiotelevisione Italiana (RIA) has provided 5,000 schools with digital satellite dishes. Internet providers are supplying Internet connections without charge. IBM is a part of a 'reinventing education initiative', while a share of teacher training is being done by private bodies. A programme for the development of teaching technology has provided multimedia equipment, one computer to fifty pupils in the disadvantaged and rural schools while the more advantaged schools have on average one computer for every ten pupils. Where Internet connections are concerned, 75% of lower

secondary and primary schools, 90% of upper secondary schools, and nearly all of the technical and vocational schools have been connected.

The Materiali per l'educazione scientifica e tecnologica (facilities for scientific and technological education) has a budget of €1.3 million and its main aim is providing the equipment and resources for scientific and technological education. A similar project, 100 progetti (100 projects), has similar objectives but is not solely interested in scientific subject areas. There are many projects, similar to those in other countries, in place to train teachers and make more people aware of the advantages of ICT use. One project involved in encouraging the uptake of PC usage among the student population, is the Programme PC per gli studenti (PCs for students). This programme makes interest free loans available to families with young students in the first year of upper secondary school in order to buy a PC that is up to the required standard (Eurydice, 2001a).

National, local and regional information society initiatives.

The Information Society Forum was established in September 1996 and in June 1997 it released a document entitled 'Promotion of Information Society Development in Italy: a reference scheme'. It acted as a general guideline for the various ministries within the government. Some of the initiatives put in place within these ministries are as follows:
Ministry of Public Administration:

- The establishing of the IT registry (1998)
- Regulation on teleworking
- The Single Service Point for Productive Activities (provision of the necessary advice/equipment for companies which are planning industrial activities) 1999
- Ministry of Treasury, Budget and Economic programming
- Establishment of an economic information website
- Activities to 'increase the transparency and efficiency of administrative work'
- Email plans for services (provision of 2,000 user point by end of 1999)
- Ministry of Finance
- Electronic tax return service
- Electronic inland internal revenue service (IRS)
- IT tools to assist taxpayers
- Ministry of communications
- Reduction in Internet tariffs
- Promotion of new technologies and systems
- Promotion of Internet access

There were a greater number of initiatives within these ministries and other ministries implemented many initiatives under this programme (Chatrie et. al., 2000).

Resulting from the numerous successful initiatives by the ministries the Government decided that on February 5 1999 three organisational bodies were to be established which were responsible for drawing up an action plan for the development of the Italian Information Society. They were to report to the newly formed Prime Ministers' Permanent Task Force and thus there was a more central body in control of the initiatives. The three bodies are The Committee of Ministers for the Information Society; An Information Society Forum; and the Inter-Departmental Study and Working Group. Preparation of an action plan took place between 1999 and early 2000, which resulted in the launch of the 'Action Plan for the New Economy' in April 2000. This plan aims to use public intervention to stimulate interaction between firms, local authorities, non-profit organisations, workers, universities and to speed up and assist 'spontaneous action of the market'. Four areas of intervention were identified.

- Human Capital: Large amounts of investment in equipment and training for schools and universities; Investment in 'support instruments' which will assist in the spreading of knowledge
- E-government To make available online governmental information and services to Italian companies and citizens
- E-commerce Outlines the necessary measures, such as coordination, rules and procedures needed to encourage and facilitate the growth of this sector
- Infrastructure, competition and access.

Appendix Ten - Luxembourg

Socio-economic background

With a total population of 0.44 million living in an area only 3,000 square kilometres in size (Eurostat, 2001a) there the population density is 171 per square kilometre of land (ITU, 2002). 91% of the population live in urban areas. The GDP in Luxembourg for 2000 was €46,590 this is 6.8% above the EU-15 weighted average (Eurostat, 2001b).

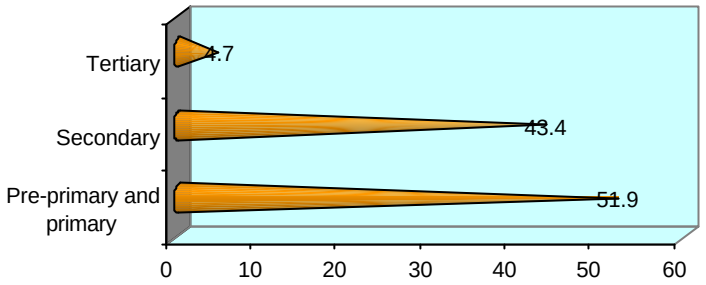


Figure A37: Public education expenditure by level (as % of all levels), 1995-97: Source, UNDP, 2001

Government expenditure on public education for the period 1995 to 1997 amounted to 11.5% of the total government spending. This is 4% of the countries GNP for the same period (UNDP, 2001). Unemployment in Luxembourg was at 2.4% by the fourth quarter of 2000 (Eurostat, 2000b). Employment by sector for 1998 is:

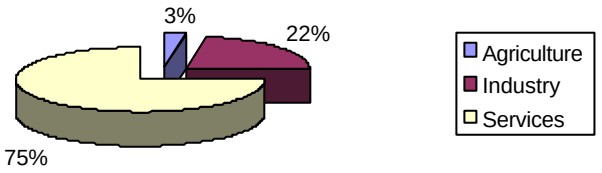


Figure A38: Total employment per sector, 1998: Source: Eurostat 2000a

Next to Luxembourgeois, spoken by 250,000 (Ethnologue, 2002j), the three most commonly spoken second languages are French (86%), German (77%) and English (45%) (West et. al. (Eds.), 2000).

Access to Technology

There were 87.2 mobile phone subscriptions per one hundred inhabitants in 2000 (Eurostat, 2002). In 1999 the number of PCs per one hundred inhabitants was 52, 25 of these were in homes while 27 were in businesses (ESIS, 2000a). The number of European Computer Driving Licence skills cards issued by the end of December 2001 is included in the French figure, which amounts to 30,760 (personal correspondence).

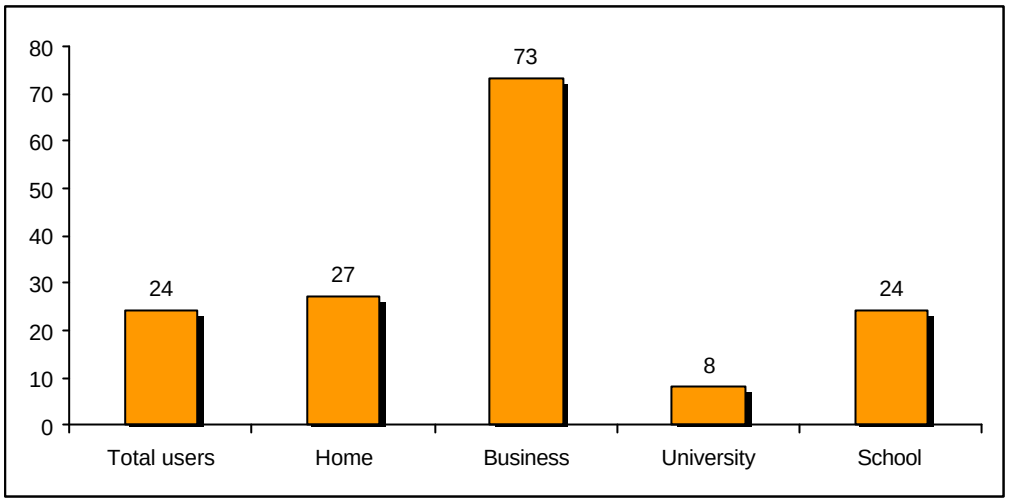


Figure A39: Total population with Internet access and location (%), 1999/2000: Source: ESIS, 2000a, Hobley, 2001

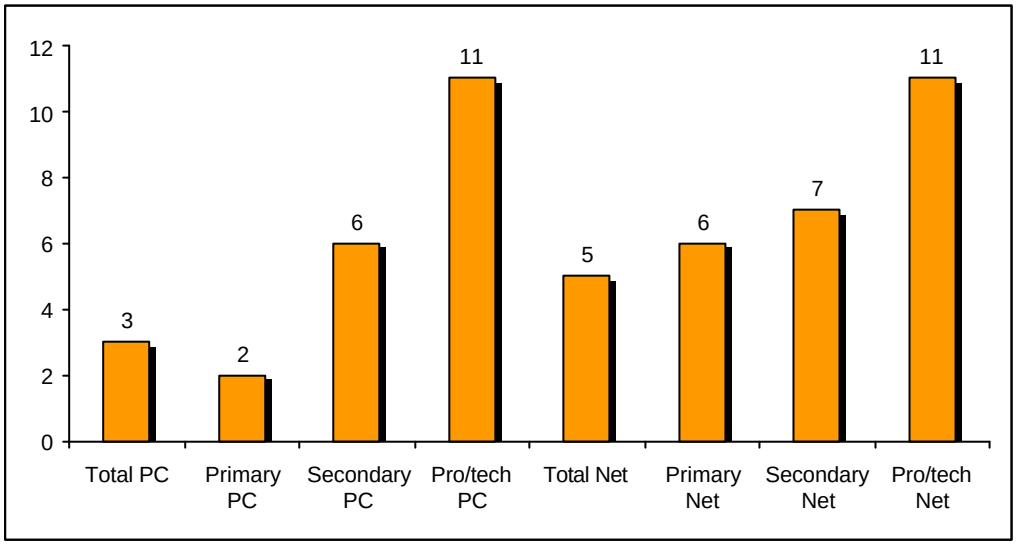


Figure A40: Pupils per PC/PC connected to the Internet, 2001: Source: eEurope, 2002a, Eurydice, 2001b

Extent of participation in distance learning

No information

Telecommunications regulation

Luxembourg has made much progress in opening up its market and facilitating competition. Early in 2001 legislation connected to licensing, interconnection, tariffs, rights of way and consumer issues, was adopted to create conformity of nearly all of its legislation with the EU legislation. Laws, put in place on 17 July 2001, give the national regulator body (ILR) the powers to intervene in all interconnection issues and disputes under its own initiative. The ILR has also, on request by new entrants, created favourable market entry. It has done this through a reduction of interconnection charges, collocation for Internet charges, and the creation of additional regional interconnection points. Fixed local loop access remains dominated by the incumbent. There has not been any adopting of a licensing regime to award 3G licences (European Commission, 2001b).

Provision of technology to the education system

Cyberlycée, a virtual online secondary school, was launched in 1997. Following the success of this, Cyberprim, an online resource centre of pedagogical and didactical tools, was set up. To assist their use of computers children can obtain a PC driving licence in their seventh year of schooling (Chatrie et. al., 2000). The Media 2000 programme is the main programme for the provision of computer and multimedia equipment to pupils in primary education. The government put €2.5 million into this project. Early in 2001 initiatives for the establishment of public and private partnerships were being drawn up. An example of this was a partnership between the Higher Technological Institute (IST) and Hewlett Packard which was aimed at providing equipment for computer rooms. Many of the projects, such as the FranTic Project, are aimed at bringing the proficiency of the pupils and teachers throughout the country in the use of ICTs up to the same level (Eurydice, 2001a).

National, local and regional information society initiatives.

The ministry of communications established the 'Info 2000 Committee in January 1995. Its main mission was to inform the government on the opportunities and threats posed by the information society. Two reports were issued, one in 1995 and the other in 1996. Four main points were made in the first.

- The information society offers a major opportunity for the country as a whole
- National competitiveness and economic performance are at stake
- Public/private partnerships are essential
- An integrated approach is vital as the issues are quite complex

The second stressed five points:

- Access to the information society should be offered by the state
- The people should be informed about the possibilities offered by ICTs by the state
- The state should offer new public services such as teleservices
- The state should be a model of how ICTs can be used most effectively
- The existing services offered by the state should be improved and simplified through the use of ICTs

These acted as the foundation for the subsequent initiatives put in place in the years to follow.

'Interdepartmental Working Groups on Information Society' were created in 1995 to investigate all of the issues relating to promotion of the information society.

- Initiatives were implemented concerning the government, electronic administration and the Internet
- An Internet working group was set up in December 1995
- In April 1998 a group was set up to establish a presence on the Internet for the government
- A project was developed in 1998 called RACE to provide administrative reform through electronic cooperation
- Reforms in March 1999 were established to facilitate the access of the public to citizen information
- FEDIL, a professional federation representing many companies, and the Chamber of Commerce published many papers on telecommunications and the information society

The Information Society of Luxembourg was established in January 1997.

May 2000 was the date of the launch of the 'Luxembourg Offensive' to establish 'eLuxembourg'. Substantial increases in funds allocated to the information society resulted in active governmental work on Internet development (more access to the Internet for more citizens), e-government (establishment of a fully online administration by 2004), development of infrastructure (UMTS broadband network and third generation mobile), and the adaptation of the legal framework to suit the information society (Chatrie et. al., 2000).

Appendix Eleven - Netherlands

Socio-economic background

The Netherlands have a total area of 41,000 kilometres squared (Eurostat, 2001a). With a population of 15.99 million, 89.3% of whom live in urban areas (UNDP, 2002), the population density is 388 people per square kilometre (ITU, 2002). GDP in the Netherlands for 2000 was €25,190 this is 11.8% above the EU-15 weighted average (Eurostat, 2001b).

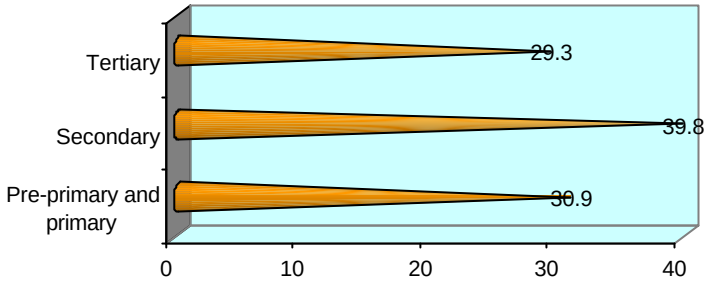


Figure A41: Public education expenditure by level (as % of all levels), 1995-97: Source: UNDP, 2001

Government expenditure on public education for the period 1995 to 1997 amounted to 9.8% of the total government spending. This is 5.1% of the countries GNP for the same period (UNDP, 2001). Unemployment in the Netherlands was at 2.8% by the fourth quarter of 2000 (Eurostat, 2000b). Employment by sector for 1998 is:

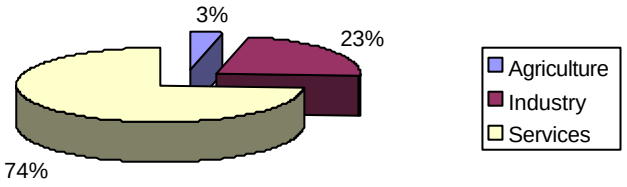


Figure A42: Total employment per sector, 1998: Source: Eurostat, 2000a

Next to Dutch, spoken by 13,400,000 people (Ethnologue, 2002k), the three most commonly spoken second languages are English (77%), German (59%) and French (15%) (West et. al. (Eds.), 2000).

Access to Technology

There were 67.5 mobile phone subscriptions per one hundred inhabitants in 2000 (Eurostat, 2002). In 1999 the number of PCs per one hundred inhabitants was 35, 18 of these were in homes while 17 were in businesses (ESIS, 2000a). The number of European Computer Driving Licence skills cards issued by the end of December 2001 was 30,729 (personal correspondence). The number of public Internet access points per one thousand inhabitants in 2001 was 0.07. The total number of graduates in science and technology as a percentage of twenty to twenty four-year-old people in 1997 was 2.4% (ESDIS 2001).

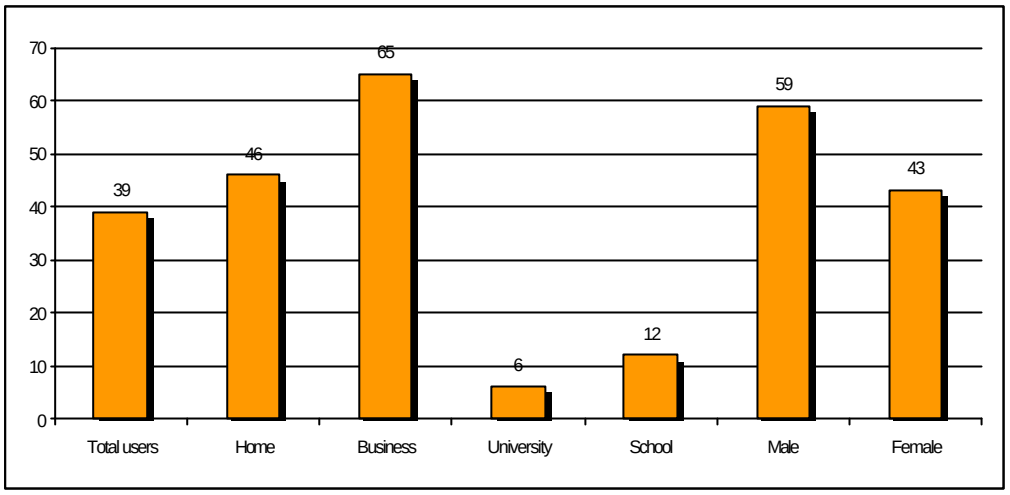


Figure A43: Total population with Internet access, location and gender (%), 1999/2000: Source: ESIS, 2000a, Hobley, 2001

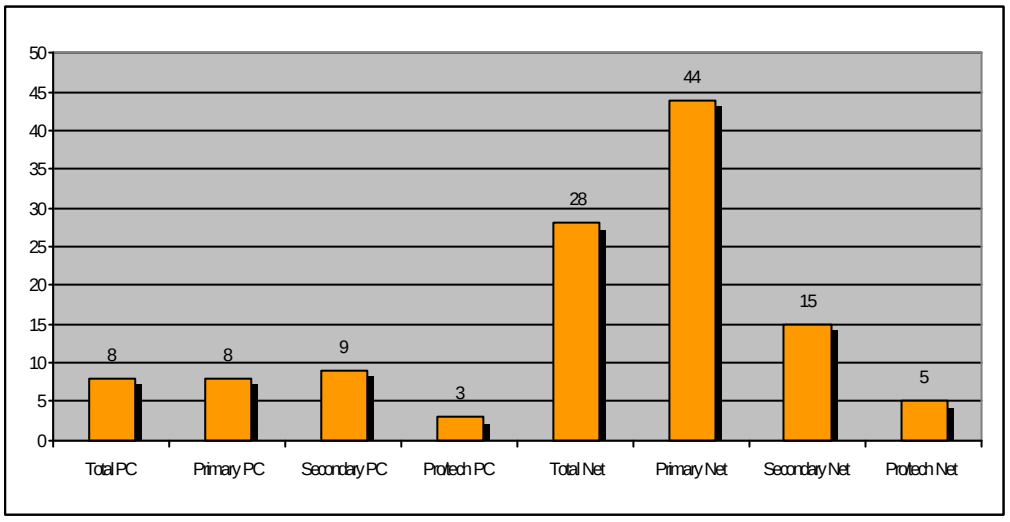


Figure A44: Pupils per PC/PC connected to the Internet, 2001: Source: eEurope, 2002a, Eurydice, 2001a

Extent of participation in distance learning

The Open University (OuNL) has been in operation since 1982. The majority of the OuNL income, €32,490,663 million in 1997, was from government grants. In 1996 there were 25,899 registered students. Any student with secondary education skills who is over eighteen is eligible. There are eighteen study centres in the Netherlands (EADTU, 1998).

Telecommunications regulation

Market entrants are becoming less optimistic where the development of the market is concerned. They blame the OPTA's regulatory approach for this. Local access competition is of major concern. The dominating concern of the new entrants is in connection with the 'weak legal tools currently provided to OPTA and a lack of support from, and commu nication with, the Ministry'. There is a constant problem with local access competition for which the incumbents behaviour and the regulators slow reaction are being blamed. Mobile local loop access licensing procedures have still not taken place. Leased lines tariffs are still quite high (European Commission, 2001b).

Provision of technology to the education system

A new action plan for education, entitled 'Education On Line: connection to the Future', was launched in April 1999. €304 million was allocated to this for the period 1999 – 2000 with a further €150 million for 2003 – 2010 (Chatrie et. al., 2000). The Kennisnet (Knowledge Net)

programme was set up in under this. This network can be accessed by anybody involved in the education sector. Its main aim is to provide a high quality, easy to use, Internet service through which groups and individuals can locate educational material and exchange information. Through this network all students can be provided with email addresses. This programme aimed to have all schools, libraries and museums connected to the Internet by the end of 2001.

A Management of ICT - Infrastructure programme (1999-2000) has the main aim of ensuring all primary and secondary schools are responsible for their ICT infrastructure in order to have them 'fully geared to established objectives'. It does this through encouraging the schools to produce their own plans for ICT incorporation while both supporting and promoting the establishment and management of the infrastructure through partnerships with local and regional authorities/firms. In the area of higher education, the expertise of teachers in and their of ICTs is to be increased. The Surfnet network, national electronic network of higher education and research institutions, is to be developed further and a digital university is to be established by twelve higher education institutions. €272 million is to be spent on ICT investment for schools by the government in 2002 (Eurydice, 2001a).

National, local and regional information society initiatives.

The Netherlands ranks fourth as an information society among the other European member state. The first national action plan concerning the information society entitled 'Action Programme for the Information Superhighways: From Metaphor to Action' was published in December 1994. It had two main concerns, the first being the liberalisation of the telecommunications market and the second was a review of the role of government in the creation of favourable conditions in the public sector. Many lines of action were taken to address these issues. In February 1997 it was announced that large scale projects to develop the educational system to incorporate ICTs and provide citizens with access to the Internet through a variety of public access points. Following a meeting of the leading Dutch companies in 1995, a 'Working Plan for the Information Superhighway – Vision on Acceleration' was published. Initiatives resulting from this include investment in infrastructures and the implementation of digital decoders for televisions. An updating of the tax system to facilitate the development of an informational economy was announced in a white paper published in December 1997 entitled 'Taxes in the 21st Century: an investigation'.

Following the 'Beyond the NAP: re-calibration of the National Action Programme Electronic Highways', which was presented by a number of ministries in April 1998, four programme clusters were for future policies were launched. The government was to actively become a legislator and instructor, there was to be much investment in ICTs for the public sector, the governmental electronic service was to be improved, innovation and developments in the ICT sector would be stepped up, and there would be investment in (tele)Communications infrastructure. The budget for this amounted to €42 million. Sectoral action plans include the 'Investment in progress' action plan for education (April 1997), the 'eCommerce Action Plan' (March 1998), and the eGovernment action plan (December 1998), all of which provided wide ranging initiatives to facilitate the development of each these sectors.

After the realisation that the government initiatives were somewhat scattered it was realised that they needed to be streamlined and made more consistent in order to remain a leader in the worlds information society. The government wanted to establish a solid base for the continuing of the country into a 'digital delta'. In June 1999 a paper was released entitled 'The Dutch digital Delta: the Netherlands on line'. The initiatives/actions were as follows (Chatrie et. al., 2000):

'Supporting innovation, competition and investment in the (tele)communications infrastructure
Ensuring the efficient allocation of frequency space
Safeguarding the technical reliability of the (tele)communications infrastructure
The development of technological know-how
The promotion of strong ICT clusters
Ensuring there is sufficient ICT personnel
Encouraging the ability and skills of both firms and citizens to access information services

Equipping general legislative and regulatory provision for the information society
To generally build confidence in the information society
Improve government performance through ICT use'.

More recent initiatives include:
'Contract with the Future: a vision on the electronic relationship between Government and Citizen' (May 2000)
The above mentioned 'Education On Line: connection to the Future' (April 1999)
'Netherlands goes Digital, an Internet and eCommerce initiative' (April 2000)
The establishment of an eCommerce monitor to document and forecast developments in that sector.

Appendix Twelve - Portugal

Socio-economic background

Portugal has a total area of 92,000 square kilometres (Eurostat, 2001a). The population is 10.02 million with a population density of 109 people per kilometre squared (ITU, 2002). 62.7% of the population live in urban areas (UNDP, 2001). Portuguese GDP for 2000 was €11,510 this is 48.9% below the EU-15 weighted average (Eurostat, 2001b).

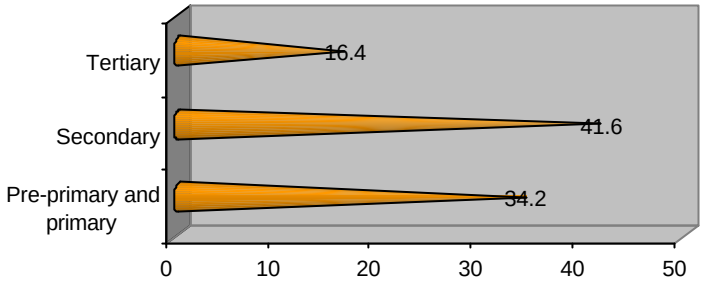


Figure A45: Public expenditure on education by level (as % of all levels), 1995-97: Source: UNDP, 2001

Government spending on public education for the period 1995 to 1997 amounted to 11.7% of the total government spending. This is 5.8% of the countries GNP for the same period (UNDP, 2001). Unemployment in Portugal was at 4.1% by the fourth quarter of 2000 (Eurostat, 2000b). Employment by sector for 1998 is:

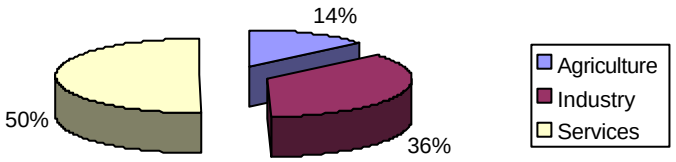


Figure A46: Total employment per sector, 1998: Source: Eurostat, 2000a

After Portuguese, the three most commonly spoken second languages are English (21%), French (18%) and Spanish (7%) (West et. al. (Eds.), 2000).

Access to Technology

There were 66.7 mobile phone subscriptions per one hundred inhabitants in 2000 (Eurostat, 2002). In 1999 the number of PCs per one hundred inhabitants was 22, 7 of these were in homes while 15 were in businesses (ESIS, 2000a). The number of European Computer Driving Licence skills cards issued by the end of December 2001 was 1,720 (personal correspondence). The total number of graduates in science and technology as a percentage of twenty to twenty four-year-old people in 1997 was 1.4% (ESDIS 2001).

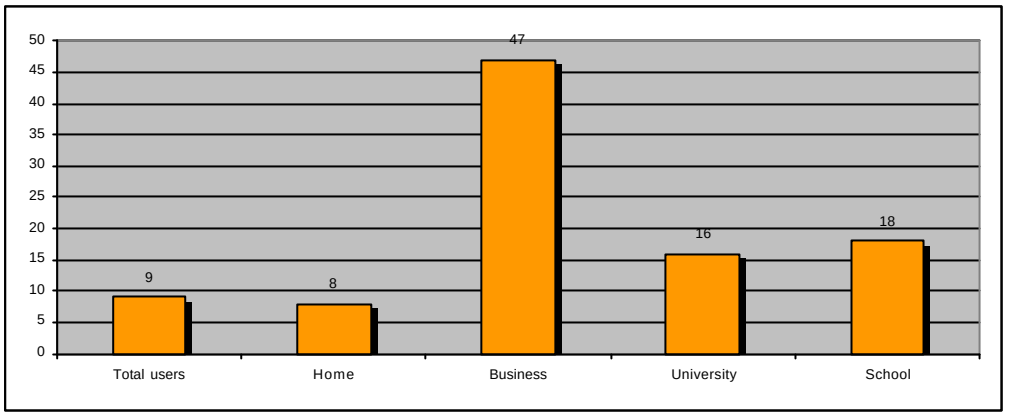


Figure A47: Total population with Internet access and location (%), 1999/2000: Source: ESIS, 2000a, Hobley, 2001

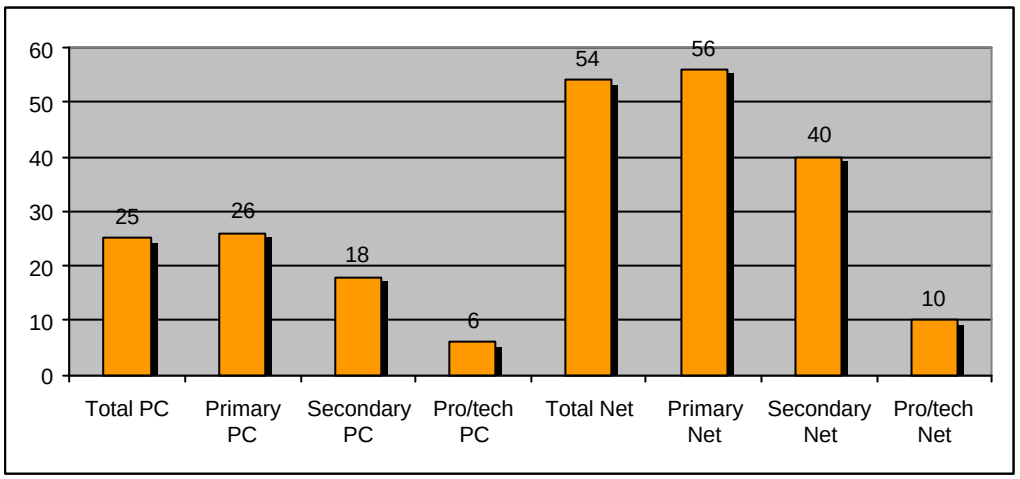


Figure A48: Pupils per PC/PC connected to the Internet, 2001: Source: eEurope, 2002a, Eurydice, 2001b

Extent of participation in distance learning

Distance education has been in operation in Portugal since 1980 and is organised by the Universidade Alberta (Univ Ab), the national distance teaching university. In 1997 11,137 students were enrolled. Students must be aged over twenty-one years old. The study centres are decentralised in twenty-two major population centres (EADTU, 1998).

Telecommunications regulation

The telecommunications market in Portugal has been fully liberalised since 2000. Interconnection prices are being reduced and are now in line with the EU average, while mobile termination rates are among the highest. Local loop competition is quite low thus it has not developed and is not expected to do so in the near future. One new entrant is among the four companies granted 3G licenses. The leased lines section of the market is the one with the weakest level of competition (European Commission, 2001b).

Provision of technology to the education system

Part of the ICT Programme For Schools was to target 750 schools from pre-primary to upper secondary level with the aim of supplying them with ICT equipment. The Prodep III initiative, funded by the European Social Fund and the European Regional Development Fund, began in 2000. Its aims include the provision of one computer per every ten pupils in secondary schools and one computer per twenty pupils in primary schools which should be one per every ten by 2006. The Nonio Seculo XXI programme provided multimedia

computers to schools 'in order to promote the use of ICT in education' (European Commission, 2000a).

The Internet initiative, running from 2000 onwards, includes the aim that all students will have access to a computer by 2003 and all citizens to have Internet access. It also aims to boost high speed broadband connections. Under the Internet na Escola initiative all secondary schools have been connected to the Internet since 1997 while universities, polytechnics and primary schools are also being provided with connections (Eurydice, 2001a). The project for University Communications Network (RCU), which was a partnership between Portugal Telecom and the Institute of Systems Engineering and Computers, provided 500 university students with access to the Internet and school computer infrastructures at special rates in its first phase (Mac Keogh, 2001).

National, local and regional information society initiatives.

Portugal, as an information society, is ranked fourteenth in the EU. The council of ministers created the 'Mission for the Information Society' (MSI) in March of 1996. It comprised five main tasks: to aid a nation-wide debate on the information society; formulate suitable measures; monitor the effects of these measures; monitor international measures; and to represent Portugal in the EU information society programmes of a scientific and technological nature. In 1997 the 'Green Paper for the Information Society in Portugal', which identified a wide range of political and technical measures to be implemented, was approved by the parliament. In total seventy-two measures were outlined. There were six priorities under which the achievements were outlined by the government in 1999, here are some examples of these (Chatrie et. al., 2000):

Bringing technology to the masses and ensuring an equal distribution of information
RCTS: a high speed network linking R&D institutions and universities
Internet in schools
Regulation of Internet charges
'Computers for all' initiative
National initiative for people with special needs in the information society
Creating Digital Cities
Promoting the digital economy
The national eCommerce initiative
PRACTIC programme for IT in industrial projects
INFOTUR project which uses the Internet for the tourism industry
Increasing Portuguese content on the Internet
'Monitoring the St@te in the Information Society'
Improve civic information on the Internet (INFOCID)
'Permanent observatory for administrative modernisation'
Specific department development, such as health, through ICTs.
'Meeting the legal challenge in the Information Society'

Following the recommendations of the 'White Paper on Scientific and Technological Policy for the years 1999-2006' the government decided to step up information society policies. The total budget for this, which is provided by structural funds (RDF, ESF) and the government, is between €1.35-1.45 billion. It was organised into four sub programmes (Chatrie et. al., 2000):
Developing Skills: 'to provide training to all and to provide certification of skills in Information, Science and Technology'
Digital Portugal Internet Initiative: 'To encourage the rapid spread of computers and the Internet in order to avoid exclusion'
The Open State: modernising the State Administration
'Observation, Monitoring and Assessment' of policies which have been previously implemented.

More recent developments include the forming of 'A New Organisational Structure' such as the reinforcing of the role of the Minister of Science and Technology and inter-ministerial co-ordination; and the launch of the 'Internet Initiative' (Iniciativa Internet).

Appendix Thirteen - Spain

Socio-economic background

Spain is has a total area of 505,000 kilometres squared (Eurostat, 2001a). With a population of 40.60 million, 77.4% in urban areas (UNDP, 2001), there is a population density of 80 per square kilometre (ITU, 2002). Spanish GDP for 2000 was €15,250 this is 32.3% below the EU-15 weighted average (Eurostat, 2001b).

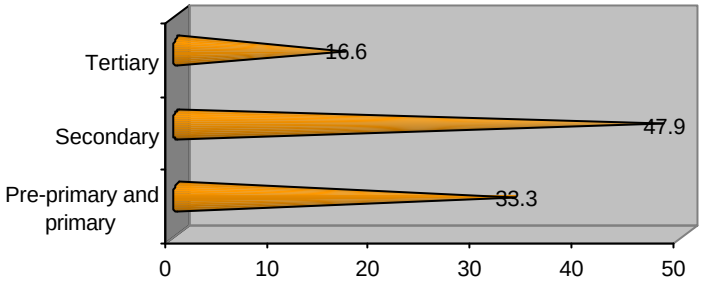


Figure A49: Public education expenditure by level (as % of all levels), 1995-97: Source: UNDP, 2001

Government expenditure on public education for the period 1995 to 1997 amounted to 11% of the total government spending. This is 5% of the country's GNP for the same period (UNDP, 2001). Unemployment in Spain was at 14.4% by the fourth quarter of 2000 (Eurostat, 2000b). Employment by sector for 1998 is:

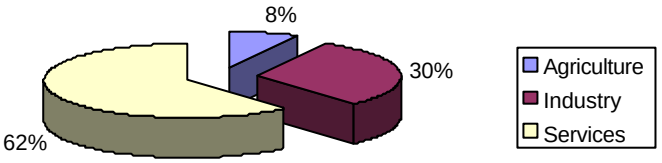


Figure A50: Total employment per sector, 1998: Source: Eurostat, 2000a

After Spanish, the three most commonly spoken second languages are English (17%), Other (17%) and French (8%) (West et. al. (Eds.), 2000,). Others languages spoken as the mo ther tongue and also as a second language include: Galician, spoken by 3,173,400 people; Catalan, 6,472,828 people; and Basque, 580,000 people (Ethnologue, 2002m).

Access to Technology

There were 62.7 mobile phone subscriptions per one hundred inhabitants in 2000 (Eurostat, 2002). In 1999 the number of PCs per one hundred inhabitants was 15, 6 of these were in homes while 9 were in businesses (ESIS, 2000a). The number of European Computer Driving Licence skills cards issued by the end of December 2001 was 468 (personal correspondence). The total number of graduates in science and technology as a percentage of twenty to twenty four-year-old people in 1997 was 2.1% (ESDIS, 2001).

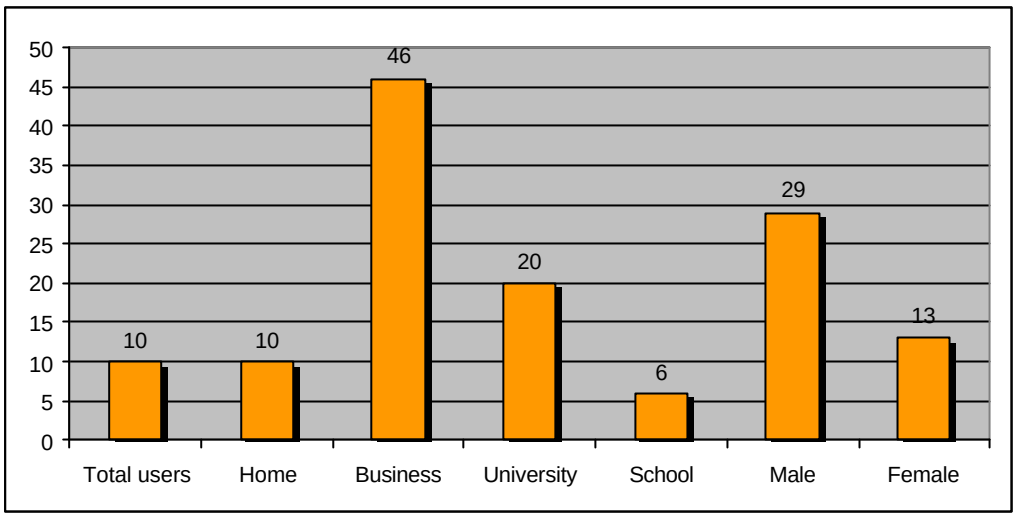


Figure A51: Total population with Internet access, location and gender (%), 1999/2000: Source: ESIS, 2000a, Hobley, 2001

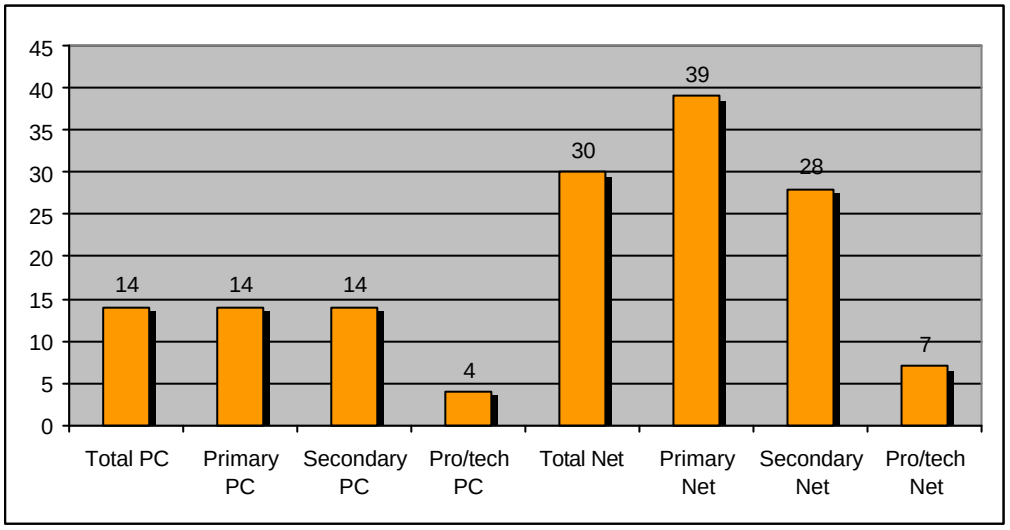


Figure A52: Pupils per PC/PC connected to the Internet, 2001: Source: eEurope, 2002a, Eurydice, 2001b

Extent of participation in distance learning

The Universidad Nacional de Educación a Distancia (UNED) was established in 1970. In 1995/96 there were 136,444 registered students. 44% of the UNED income is derived from the government while student fees make up the remainder. There are no entry prerequisites to the open distance teaching programme. UNED has fifty-nine study centres (EADTU, 1998).

Telecommunications regulation

The Spanish market was liberalised in 1998. The Spanish regulator has taken many bold measures in attempting to encourage competition in the market. By 2001 there were not many local loops unbundled. The incumbent has undertaken an aggressive ADSL roll out policy which worries the new market entrants. The 3G launch date has been moved from August 2001 to June 2002 after a comprehensive consultation of the sector. There have been many complaints by new entrants regarding the unsatisfactory contractual conditions and high prices regarding leased lines (European Commission, 2001b).

Provision of technology to the education system

Eight initiatives concerned with the application of ICTs in education have been put in place by the Ministry of Education, Culture and Sport under a 'programme for the new information technologies'. The Aldea Digital programme is concerned with introducing new technologies into rural schools, which are situated in sparsely populated areas. The programme has been developed in more than 2,500 rural schools. The Redes programme is similar to the Aldea programme in that it provides facilities but it also equips schools with intranets. It is more targeted at all members of the educational community. A third initiative is concerned with multimedia materials and equipment widely available. The final initiative concerned with provision of technology is concerned with connecting all schools to the Internet and e-mail facilities. In one programme 40,000 teachers were provided with Internet connections (European Commission, 2000a). The remaining initiatives are mostly concerned with training people to use and promoting the to use of ICTs for education (Eurydice, 2001a).

National, local and regional information society initiatives

Despite there not being any one coordinated governmental policy prior to 1998, different ministries conducted a number of initiatives and programmes.

PISTA programme: 'Promotion and Identification of the emerging services in advanced telecommunications'

ARTE/PYME programme: 'Regional Actions in Telecommunications for SMEs'

ATYCA: 'National Plan for the Support of Technology, Security and Quality in the Industry'

PN-AST (national programme for telematic applications and services) and PN-TIC programmes (National plan for ICTs)

PNTIC: 'National Programme of the Ministry of Education and Culture for ICT'

Regional information society strategies include 'Catalonia on the Network', which has facilitated the rise of the region as the most advanced region with regard to ICT application, and INFODEX, an 'Information Society Regional Strategy in Extremadura'.

Measures to construct a national strategy began early in 1998 with the formation of an Information Society Advisory Group. It had published a report by July outlining several recommendations and the views of the industries. These included recommendations such as the promoting the creation of new infrastructures; stimulating the demand in the various sectors; creating a forum on information society; using financial measures and specific innovation projects to promote added value; and the creation of an inter-ministerial committee for the information society. An Information Society Forum was established in October 1998. The Cabinet began the process of establishing a national strategy in April 1999 and within three months, a Royal Decree resulted in the creation of 'The Interministerial Commission of Information Society and New Technologies'. Under this decree the government was instructed to prepare an inventory of initiatives which were already implemented or were planned. By March 2000 374 initiatives were identified. The new Information Strategy for Spain, entitled 'INFO XXI: Information Society for ALL', was approved in January 2000. It was to receive €2.5 billion by the government and was to be conducted over a three-year period beginning 2000.

Examples of the programmes with priority actions will be detailed below (Chatrie et. al., 2000):

Infrastructure and Networks

Access to all citizens: new access channels and pricing model for the telecommunications service, regulation of Internet access and mobile telephony, new projects launched under the PISTA initiative.

Deployment of wide band infrastructures.

Legal Framework

Economical Framework: economic commerce regulations and the creation of a project for the 'Certification Service Providers Register'.

Technical framework: development of electronic signature and telecommunications regulations, providing the Internet as a part of a total telecommunications service, and the provision of information on the legal aspects of security.

Social Framework: consumer protection, data protection and creation of juridical support to eCommerce.

Social Sector: using organisational commitment to develop citizens' interests.
Industry Sector: promotion of the inevitability if the 'Information Society process', identifying both weaknesses and strengths of Spanish sector, and construction of strategies to enhance and reinforce competitiveness.
Public awareness and motivation
Best practice inventory
Information: to promote positive aspects of using the new telecommunications service
Demonstration: events to stimulate interest among the general public.

A successful initiative from within this is the 'Access to All' initiative which aims to provide three million homes with Internet connections and extend the provision of communication networks outside of the major urban centres. The government has a goal to create fifty local business centres to provide SMEs with the ability to adopt e-business into their companies. An e-health service is to be provided to 50% of health districts by 2004 (Chatrie et. al., 2000).

Appendix Fourteen - Sweden

Socio-economic background

Sweden has a population of 8.88 million and a population density of 20 people per square kilometre (ITU, 2002). The total land area is 411.000 square kilometres (Eurostat, 2001a) and 83.3% of the population live in urban areas (UNDP, 2001). Swedish GDP for 2000 was €28,010 this is 24.3% above the EU-15 weighted average (Eurostat, 2001b).

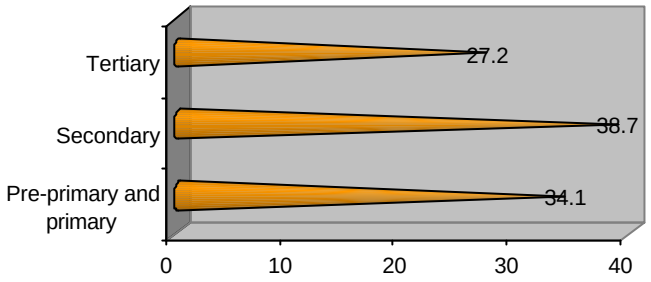


Figure A53: Public education expenditure by level (as % of all levels), 1995-97: Source: UNDP, 2001

Government spending on public education for the period 1995 to 1997 amounted to 12.2% of the total expenditure. This is 8.3% of the countries GNP for the same period (UNDP, 2001). Unemployment in Sweden was at 6.2% by the fourth quarter of 2000 (Eurostat, 2000b). Employment by sector for 1998 is:

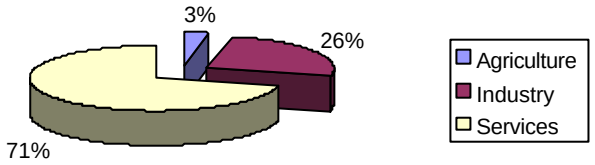


Figure A54: Total employment per sector, 1998: Source: Eurostat, 2000a

Next to Swedish, the three most commonly spoken second languages are English (75%), German (24%) and Danish (11%) (West et. al. (Eds.), 2000).

Access to Technology

There were 71.9 mobile phone subscriptions per one hundred inhabitants in 2000 (Eurostat, 2002). In 1999 the number of PCs per one hundred inhabitants was 51, 31 of these were in homes while 20 were in businesses (ESIS, 2000a). The number of European Computer Driving Licence skills cards issued by the end of December 2001 was 353,306 (personal correspondence). Public Internet access points per one thousand inhabitants in 2001 was 0.11The total number of graduates in science and technology as a percentage of twenty to twenty four-year-old people in 1997 was 2.9% (ESDIS 2001).

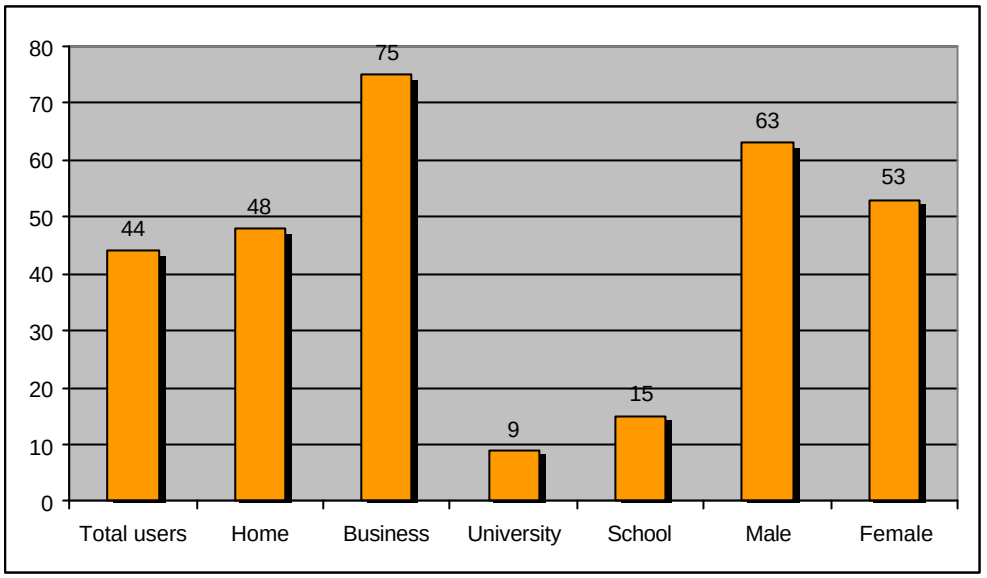


Figure A55: Total population with Internet access, location and gender (%), 1999/2000: Source: ESIS, 2000a, Hobley, 2001

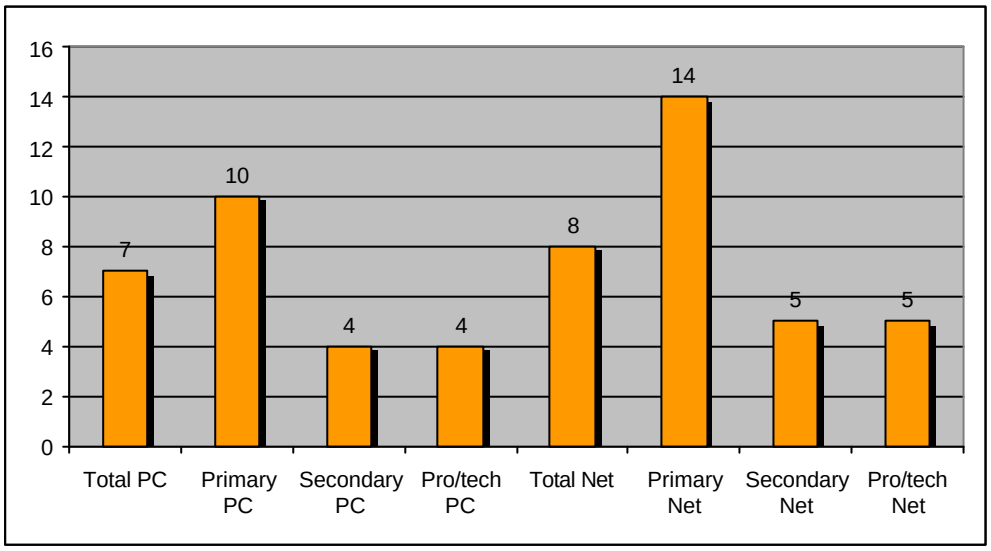


Figure A56: Pupils per PC/PC connected to the Internet, 2001: Source: eEurope, 2002a, Eurydice, 2001b

Extent of participation in distance learning

The Swedish Association for Distance Learning (SADE) was founded in 1984. The programme is fully funded by the state and had a compliment of 24,000 registered students in 1996. There are many off-campus centres developing which provide the necessary facilities (EADTU, 1998).

Telecommunications regulation

Partially state funded broadband roll out, with the goal of reaching every household, is ongoing. There are proposals to reinforce the national regulatory authority's (PTS) powers which, if enacted, could reduce the appeal procedure through the courts thus reducing the speed and cost. In general, the licensing regime in Sweden is believed to be quite light. The incumbent offers fully unbundled and shared lines but the uptake has been slow due to prices. Fair competition has not been allowed to develop. Competition in the mobile market is also insufficient. Roll out of 3G is on target (European Commission, 2001b).

Provision of technology to the education system

The Tools for Learning report was issued in spring of 1998 with the aim of 'speeding up the widespread introduction of ICT use and 'provide training in small groups for over 40% of teachers in service' (European Commission, 2000a). Following this, the national programme for ICTs in schools (ItiS), with a €185 million budget, was launched (1999-2000). Among its objectives are to supply teachers with computers for training which they will be able to keep, to speed up Internet connections within schools, provide e-mail addresses to students and teachers and to develop the Schoolnet network. In the area of distance learning, initiatives were implemented which facilitate and fund the use of ICTs in distance education projects. The 2001 budget for this amounted to €1.74 million (Eurydice, 2001a). Projects such as ASKen, an information system on Swedish higher education, were launched by the National Agency for Higher Education. They also co-ordinate the Swedish university network (SUNET) (Chatrie et. al., 2000).

National, local and regional information society initiatives.

Sweden is considered to be the world leader as an information society. The first national commission on IT was set up in March 1994. However, a new IT commission was set up in January 1995 after a change in government. Throughout 1995 it developed guidelines for a national action plan and its implementation. Three areas of priority were recognised: the legal system; education; and the provision of information to society at large. In March 1996 a third IT commission was called and during the Autumn a IT legal observatory was established to advise the government on the necessary legal changes to be implemented as a result of rapid developments in ICTs and thus society. Following the findings of a fourth IT commission in 1998 (called the ICT commission), which as well as providing advice had to compile initiatives, many public initiatives were launched between 1996 and 1999.

Initiatives in the education sector were dealt with above. There was also initiatives put in place in the cultural sector and in the area of public administration. 'Culture Net Sweden' was a major initiative designed to increase access to Swedish culture over the Internet. Access to the Swedish public sector is being provided by SverigeDirekt, a single service portal while a project entitled '24x7 Government Services' aims to provide twenty four-hour services to all citizens. A new IT bill was drawn up in April 2000 entitled 'Information Society for All' with the ambition to build on the previous bills. Under this initiative, large amount of investment was put into developing infrastructure. €2.03 billion was invested in broadband, €993 million in IT infrastructure, and €300 million on the municipalities' network. The bill also provided the action plan responsible for the following measures (Chatrie et. al., 2000):

Enhancing IT confidence:

- A stable and secure Internet with Swedish areas of the Internet functioning without reliance on other nations
- Increased security technologies such as the development of electronic signatures through promotion and legislation.

Enhancing IT competence:

- IT programmes for small businesses, schools etc.
- Increased numbers of places in higher education places (an extra 10,000 per annum) especially in natural sciences and technology, launch of 'IT University', formation of a competence centre for Internet technology, and the expansion of a cluster which focuses on silicon technology.

Increased IT accessibility:

- Provision of a backbone network to all urban centres, provision of funding for regional line connections, establishment of a broadband programme
- Local authority grants and subscriber tax relief to encourage the use of high transfer capacity networks in remote areas.

Other measures:

- Various other measures were put in place to encourage the development of e-business, healthcare etc. through the use of ICTs.

Appendix Fifteen - United Kingdom

Socio-economic background

The UK is 242,000 square kilometres in size (Eurostat, 2001a). With a population of 59.77 million, 89.4% occupying urban areas (UNDP, 2001), there is a population density of 244 people per square kilometre (ITU, 2002). GDP in the UK for 2000 was €25,930 this is 15.1% above the EU-15 weighted average (Eurostat, 2001b).

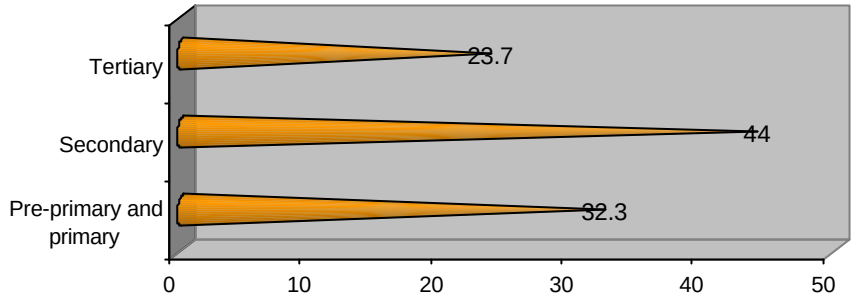


Figure A57: Public education expenditure by level (as % of all levels), 1995-97: Source: UNDP, 2001

Governmental expenditure on public education for the period 1995 to 1997 amounted to 11.6% of the total government spending. This is 5.3% of the countries GNP during the same period (UNDP, 2001). Unemployment in the UK was at 5.6% by the fourth quarter of 2000 (Eurostat, 2000b). Employment by sector for 1998 is:

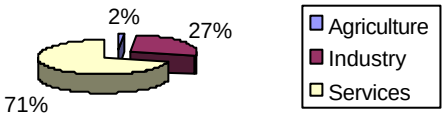


Figure A58: Total employment per sector, 1998: Source: Eurostat, 2000a

Next to English, the three most commonly spoken second languages are French (14%), German (5%) and Spanish (2%) (West et. al. (Eds.), 2000).

Access to Technology

There were 72.9 mobile phone subscriptions per one hundred inhabitants in 2000 (Eurostat, 2002). In 1999 the number of PCs per one hundred inhabitants was 49, 11 of these were in homes while 38 were in businesses (ESIS, 2000a). The number of European Computer Driving Licence skills cards issued by the end of December 2001 was 328,967 (personal correspondence). Public Internet access points per one thousand inhabitants in 2001 was 0.03 The total number of graduates in science and technology as a percentage of twenty to twenty four-year-old people in 1997 was 4.5% (ESDIS 2001).

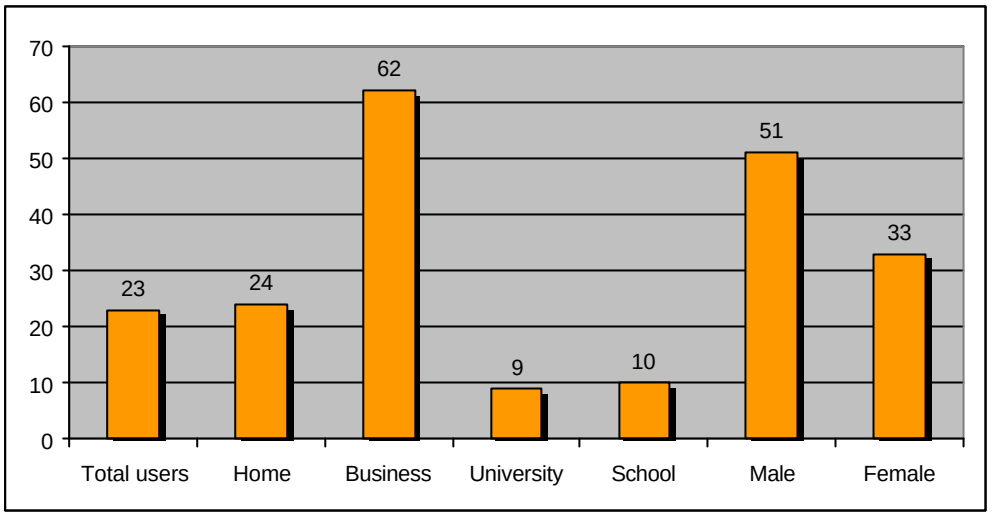


Figure A59: Total population with Internet access, location and gender (%), 1999/2000: Source: ESIS, 2000a, Hobley, 2001.

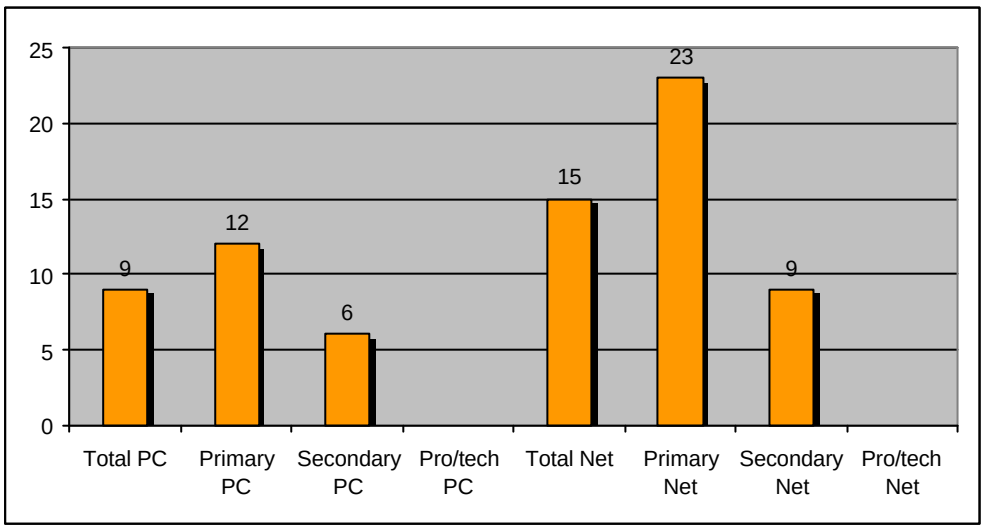


Figure A60: Pupils per PC/PC connected to the Internet, 2001: Source: eEurope, 2002a, Eurydice, 2001b

Extent of participation in distance learning

There are two distance learning institutions in the UK. They are the Open University (UKOU) and the Open Learning Foundation (OLF). The UKOU presented its first course in 1971. It is 57% funded by the government and had 257,000 students enrolled in 1996. Access is open to all above the age of eighteen. The UKOU has 330 study centres in the EU. The OLF was established in 1991. In 1996 it had 8500 students studying at a distance (EADTU, 1998).

Telecommunications regulation

There are 311 public telecommunications operators. OFTEL is independent from these and has the requisite powers under EC law. Plans are advancing to establish a single regulatory authority, which will administer a single regulatory framework. OFTEL offers flat rates for Internet usage. 3G roll out is on schedule. Competition in the mobile market is developing. Local loop unbundling is problematic. There are, however, other means of providing local access, such as telecommunications services offered by cable companies, which are popular. The market for leased lines is not as competitive as OFTEL would wish (European Commission, 2001b).

Provision of technology to the education system

The Superhighway Initiative was launched in 1995 and involved 25 projects and around 1,000 schools. The results from this made it possible to launch and define the British Governments National Grid for Learning (NGfL) initiative (European commission, 2000a). This aims to provide high quality educational software to both teachers and students through public/private partnerships. It had a budget of €1.138 billion for the period 1998-2002. Its aim is to have one computer for every five pupils in secondary school, for every eight in primary schools. It also wants to have a minimum of 75% of students aged 14 to have the ability to use the Internet for studies and to have used technologies such as CD-ROMs. There are programmes in England and Wales called laptops for headteachers and computers for teachers, subsidising 50% of the price. There is also the fast-track programme, which supplies laptops that are Internet ready to selected teachers. City Learning Centres are being established as part of an initiative to increase the level of education among city children. It has a budget of €160.72 and aims to have 80 centres by the end of 2002 (Eurydice, 2001a).

The Joint Information Systems Committee (JISC) is involved in further and higher education across the UK. It promotes the innovative application and use of information systems/technology in higher and further education. The ICT for Learning Strategy in Wales is, among other concerns, interested in the provision of ICTs to students for use both within and outside school to provide the foundation for the development of lifelong learning in Wales. It also aims to make ICTs more available to disadvantaged areas. It has a budget of €25.33 million.

The Education Technology Strategy in Northern Ireland began in October 1997. It aims to provide all schools with the necessary infrastructure of equipment and online services needed for students to take part in the information society. There is a similar programme for further education called Information Learning Technology in Further Education. The e-University initiative is to begin in 2002, has a budget of €100.85. A result of this project, when fully established will be that any higher education institution in the UK will be able to offer courses and services over the Internet.

Scotland has separate initiatives in place but they are quite similar to those in the rest of the UK. The modernisation of schools: implementing the National Grid for Learning in Scotland aims to have on e computer, capable of using the Internet, available for 7.5 pupils in primary education and 5.1 for those in secondary. All schools are to have access to the Internet. It has a budget is €127.1 million. It began in 1999 and will end in April 2002. A similar programme is in place for further education. It is a three-year programme with a budget of €46.1 million. It aims to improve teacher training, the infrastructure and facilities available, develop the network, and encourage schools to develop strategies for the incorporation of ICTs.

From March 2001 the SuperJANET 4 initiative began to offer high-speed online resources and services through a national network of further and higher education institutions. Finally, the Use of Metropolitan-Area-Networks Initiative (UMI), as the name suggests, takes advantage of the high-speed broadband networks within the metropolitan areas for higher education.

National, local and regional information society initiatives.

As an information society, the UK ranks fifth among the EU member states. The first national strategies regarding ICTs were launched in 1995. They were in the health and education sectors. The NHSnet initiative coordinated the development of a national data network within the National Health Service to assist in the secure and efficient of exchange of patient treatment information. A five-year programme called the 'Information Society Initiative' (ISI) was launched in February 1996. It had a €58 million budget to be used in the promotion of ICTs among businesses and the general public within the UK. Initiatives implemented within this were 'IT For All' (1996), which aimed to promote ICTs and the benefits they provide among the public and private sectors, and 'Programmes for Business', which was a government/industry partnership aimed at the promotion of ICTs among SMEs. A project called 'direct.link' was launched in November 1997. Within this there were several sub-projects one of which was involved in the provision of information kiosks for rural areas.

From 1997, with the entry into government of the Labour Party promising to modernise Britain, new strategies for the information age were being presented. These were to coincide with the ISI programme, which was to run until 2000. Many new initiatives were implemented after the release of the governmental policy statement entitled 'Our Information Age, the Government vision'. Some of them are as follows (Chatrie et. al, 2000):

- Transforming education and skills for the future:
- Link schools to the Internet under the National Grid for Learning initiative
- Online virtual teacher centre established
- University for Industry programme (€382 million)
- Widening Access
- Provision of ICTs for libraries (all on line by 2002)
- Development of 'IT for All' learning centres for beginners through public/private sector and local government/volunteer sector partnerships
- Promotion of competition and competitiveness
- Competition bill drawn up
- ISI local support centres developed
- Fair and effective taxation of e-commerce
- Fostering Quality
- Precautions against undesirable content
- Digital broadcasting promotion
- Creation of the Internet watch foundation
- Modernising Government
- Secure intranet created
- Electronic access to all government offices and staff.

New initiatives were launched in 2000. Goals included within these were to have all government services online and the provision of the Internet to all who want it by 2005. The 'Digital Scotland Initiative', the 'Wales Information Society Initiative' and the 'Northern Ireland Information Age Initiative' are all examples of how the devolved administrations were developing the information age programme at a regional level. The 'UK online' campaign was launched in September 2002. It had the overriding aim of making Britain one of the worlds leading knowledge economies through government, industry, trade union, voluntary sector and consumer group partnerships. Three sets of initiatives were to be implemented under this campaign.

- *Getting people online:* provision of centres for training in disadvantaged communities and the launch of Learndirect which aims to provide one million online courses per year for anybody who has access to an Internet connection.
- *Getting businesses online:* €41.4 million provided to assist companies in the adoption of ICTs.
- *Getting government online:* €1.7 billion invested to bring all government services online (Chatrie et. al, 2000).

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