

Pillar 6:
Digital Competence in the Digital Agenda

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1. INTRODUCTION

As ICT spreads throughout our societies, touching more and more parts of our lives, so digital competence has become essential for every individual. We are confronted with ICT from our youngest years when we are starting to learn in school and it supports life-long learning when we have left school. ICT has spread throughout the work place, so that the large majority of jobs now require some form of ICT skills. ICT also plays a larger and larger role in our private lives for leisure/entertainment, communication and social interaction, our health and well being, as well as with respect to our participation in society.

The importance of digital competence was recognised by the European Parliament and the European Council in 2006 in its recommendation on key competences for lifelong learning when it identified digital competence as one of eight key competences essential for all individuals in a knowledge-based society.

Furthermore, previous analysis has shown that lack of skills is an important reason for the digital divide i.e. for the large number of non-users in the EU, 30% in 2009. As such, one of the pillars of the Digital Agenda for Europe is devoted to digital literacy/competence, skills and inclusion, with a number of actions in this area. This chapter analyses recent developments in digital competence/literacy in Europe.

2. WHAT IS DIGITAL COMPETENCE?

In 2006 the European Parliament and the European Council published a recommendation on key competences for life long learning.¹ The recommendation provided a European Reference Framework on Key competences for Life long learning in which eight key competences were identifies and defined. The Communication and reference framework had grown out of the need recognised and expressed at previous European Councils² for a European framework to define the basic skills to be provided through life long learning as a key measure in Europe's response to globalisation and the shift to a knowledge-based society.

Competences were defined as a combination of knowledge, skills and attitudes appropriate to the context. *Key competences* were those which all individuals needed for personal fulfilment and development, active citizenship, social inclusion and employment.

One of these eight key competences was *digital competence*.³ While all of the key competences were deemed equally important and inter-related, competence in the fundamental basic skills of language, literacy, numeracy and information and communication technologies were described as an essential foundation for learning.

Digital competence was defined as follows:

"Digital competence involves the confident and critical use of information Society technology (IST) for work, leisure, learning and communication. It is underpinned by

¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:394:0010:0018:en:PDF>

² Starting with the Lisbon European Council (23-24 March 2000).

³ The others being: communication in a mother tongue, communication in a foreign language, mathematical competence and basic competences in science and technology, learning to learn, social and civic competences, sense of initiative and entrepreneurship and cultural awareness and expression.

basic skills in ICT: the use of computers to retrieve, access, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet."

Where essential knowledge skills and attitudes related to this competence were described in the following way:

"Digital competence requires a sound understanding and knowledge of the nature, role and opportunities of IST in everyday contexts: in personal and social life as well as at work. This includes main computer applications such as word processing, spreadsheets, databases, information storage and management, and an understanding of the opportunities and potential risks of the Internet and communication via electronic media (e-mail, network tools) for work, leisure, information sharing and collaborative networking, learning and research. Individuals should also understand how IST can support creativity and innovation, and be aware of issues around the validity and reliability of information available and of the legal and ethical principles involved in the interactive use of IST.

Skills needed include the ability to search, collect and process information and use it in a critical and systematic way, assessing relevance and distinguishing the real from the virtual while recognising the links. Individuals should have skills to use tools to produce, present and understand complex information and the ability to access, search and use internet-based services. Individuals should also be able use IST to support critical thinking, creativity, and innovation.

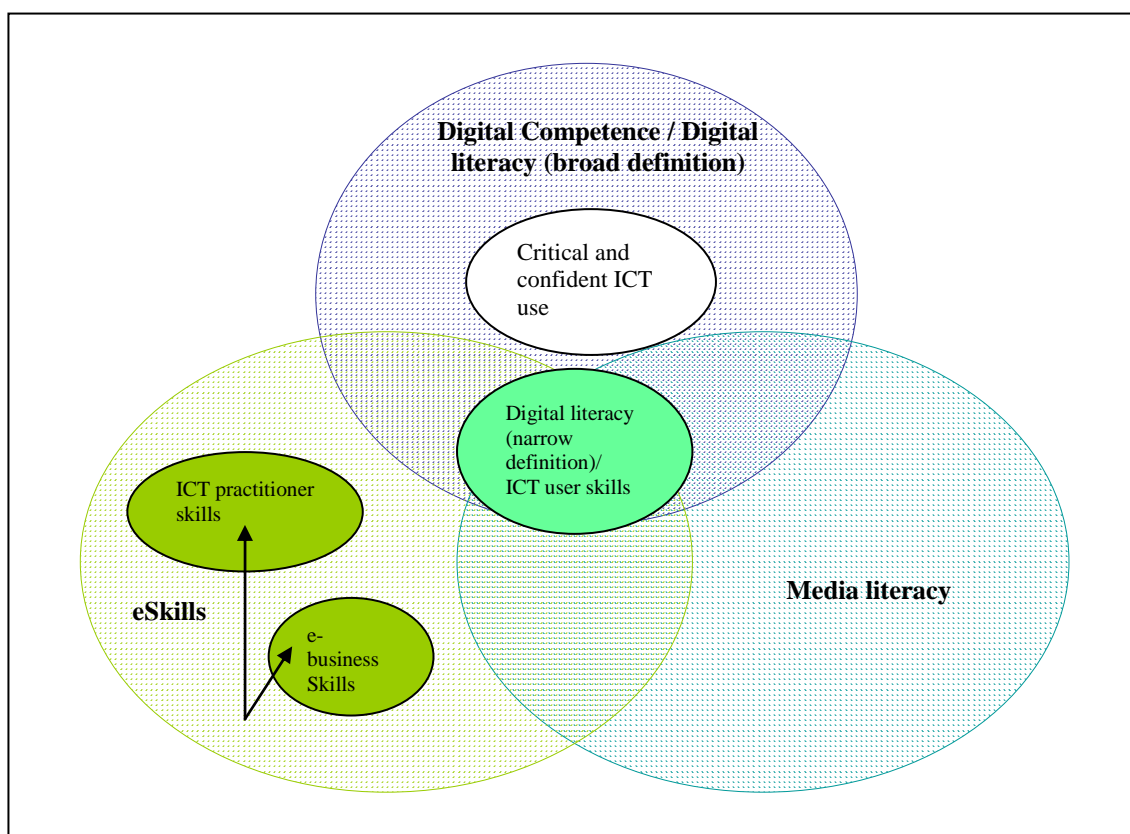
Use of IST requires a critical and reflective attitude towards available information and a responsible use of the interactive media. An interest in engaging in communities and networks for cultural, social and/or professional purposes also supports this competence."

From the above, it can be appreciated that digital competence is a very broad concept, including much more than basic skills in the use of ICT. It relates to other similar concepts such as digital literacy, eSkills and Media literacy (see Figure 1).⁴ In particular, digital competence can be considered as digital literacy in the broad sense. It encompasses the basic ICT user skills included under the term eSkills, as well as the digital part of Media Literacy. Whereas in the past analysis of skills focused on a more narrowly defined concept of digital literacy; here we take this broader approach.⁵

⁴ See the annex to this chapter for definitions of these concepts.

⁵ This process is aligned with JRC IPTS' work on detailing digital competence, for all levels of learners, see: <http://is.jrc.ec.europa.eu/pages/EAP/DIGCOMP.html>

Figure 1: Visual representation of concepts relating to digital competence, eSkills and media literacy



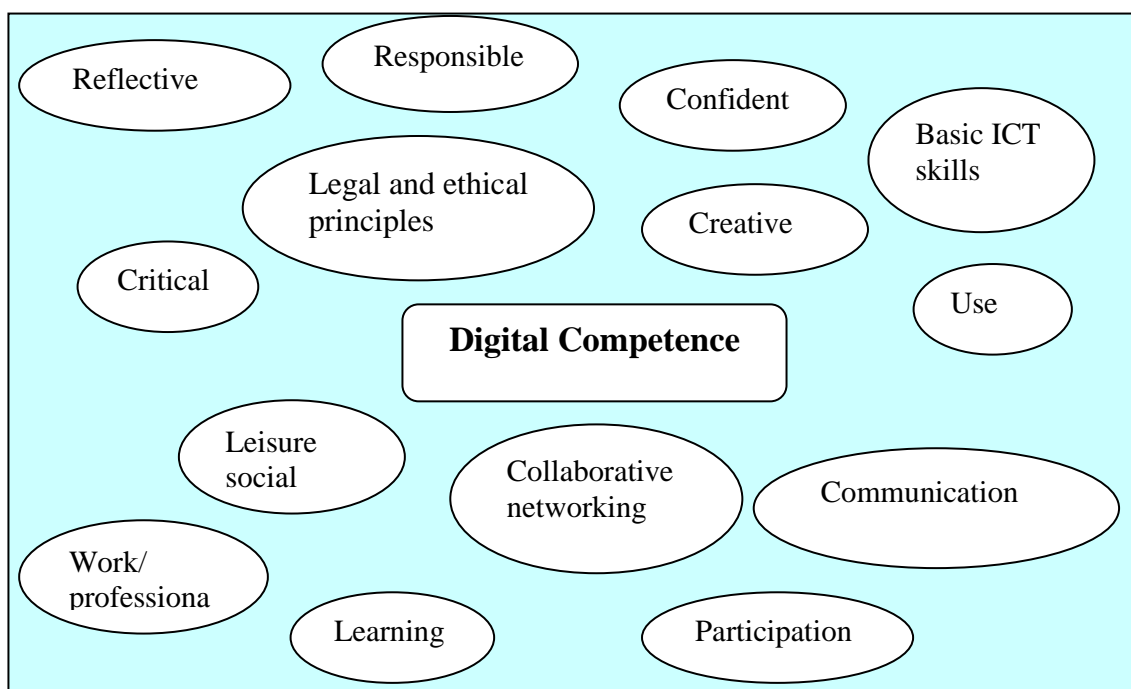
Source: Commission Services

3. WHAT DOES DIGITAL COMPETENCE COMPRISE?

From the definition outlined in section 2 of this chapter, the main aspects of digital competence can be discerned. These main aspects can be viewed in the below cloud diagram. These aspects are all related to the individual's competences. However, added to this there are environmental factors which contribute to them. In particular, access to ICT is essential for effective use of ICT. Therefore the analysis here also involves these environmental factors.

Based on the above, table 1 outlines a conceptual framework for digital competence structured along two main dimensions: Environmental factors and individual competence. Environmental factors relate to the availability of ICT and therefore access to it. These ICT include computers, the internet, smart phones, tablet PCs and other ICT devices allowing access to the internet. Individual competence includes (2) basic use/operational skills, (3) active application to aspects of life (or "advanced use") and (4) personal attitudes. Basic operational skills include basic computer and internet skills. "Active application to aspects of life" includes application to the areas work/professional life, learning (in a life-long learning context i.e. including formal compulsory education, but also informal and non-formal learning, outside of compulsory education), Communication, participation in society, leisure and collaborative networking. "Personal attitudes" includes critical and reflective use, responsible use, legal and ethical principles, confident use and creative use. This framework can be seen in table 1 below.

Figure 2: **Cloud diagram of the main aspects relating to digital competence**



Source: Commission services

Table 1: **Conceptual framework for digital competence**

Environmental factors:	(1) Access to ICT	<ul style="list-style-type: none"> • Computers • Internet • Smart phones • Tablet PCs • Etc.
Individual competence:	(2) Basic use/operational skills	<ul style="list-style-type: none"> • Basic computer use and skills • Basic internet use and skills
	(3) Active application to aspects of life (or "advanced use")	<ul style="list-style-type: none"> • Work/professional • Learning(LLL) • Communication • Participation in society • Leisure

(4) Personal attitudes

- Collaborative networking
- Critical/reflective use
- Responsible use
- legal and ethical principles
- Confident use
- Creative use

3.1. Access to ICT

In order for an individual to become digitally competent, he/she first has to have access to this ICT. Therefore access to digital technologies is a crucial environmental factor contributing to digital competence. In the past this access meant having access to a computer. However, rapid technological change in the ICT sector over the last few years has brought about a new wave of innovation in access technologies. So that we can no longer say that computers are the only or main access devices. In particular, the rise of the smart phone and more recently the large scale role out of tablet PCs have once again revolutionised our connection to ICT, allowing more flexibility of use (anytime, anywhere), increasing its areas of application and making ICT more accessible to the general population. Also, other devices allow access to the internet, such as games consoles, PDAs and digital television. As such, a wider array of access devices should be taken into account when measuring access than purely computers. Furthermore, access to ICT obviously includes access to the internet. Therefore, access to broadband is also included in access to ICT.

3.2. Basic use/operational skills

The basis of digital competence is the acquisition of basic operational ICT skills. Basic operational skills refer to the basic skills needed in order to allow the functional use of ICT. Those skills therefore should include basic operational skills for computers and the internet. Some of these operational skills, in particular for computers, are outlined in the definition of digital competence. However, as discussed above they should also include the operational skills needed for other mainstream ICT devices such as for example smart phones, tablets and Wi-Fi. And, as other devices such as digital television with internet become more mainstream, in the future they will probably also include the operational skills needed for these such devices. It is a feature of ICTs that rapid technological development necessitates an ever changing skills basket and the need for life-long learning.

3.3. Active application to aspects of life or "advanced use"

Beyond the ability to perform basic operational ICT tasks, digital competence involves the use of ICT for a multitude of aspects of everyday life. The groups of areas identified in the Council definition of digital competence include: work/professional life, learning, communication, participation in society, leisure and collaborative networking. In essence, these should cover all aspects of (digital) life and in many ways can be thought of as more

advanced use of the internet than operational skills such as using a search engine or sending emails etc. as their primary function is not for the use of ICT but rather to use ICT for the achievement of personal, social and economic goals.

3.4. *Personal attitudes*

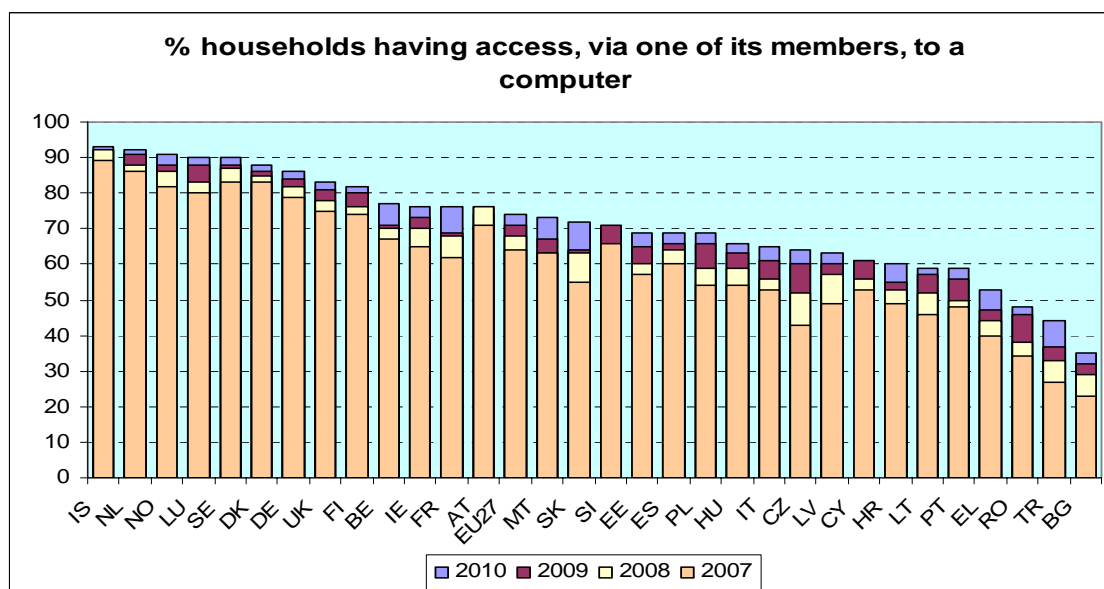
Personal attitudes refer to "how" individuals use ICT. In particular, a digitally competent individual should be critical and reflective in their use. In other words, they should be able to assess the credibility and reliability of the information they receive on the Internet, the sources they use and the individuals they encounter. They should be responsible users and should abide by the law and to other social norms of conduct. They should be confident and creative in their use.

4. RECENT EVIDENCE ON DIGITAL COMPETENCE IN EUROPE

4.1. *Access to ICT*

On average for the EU27 74% of households had **access to a computer at home** in 2010. This represents a 3pp. increase over 2009. Indeed household computer ownership continues to grow across the EU and other European countries, with all but Cyprus recording an increase since 2009.⁶ Rates of household computer ownership have increased to at or above 90% in the leading ICT countries (IS, NL, NO, LU and SE). At the other end of the scale Romania, Turkey and Bulgaria have less than 50% household access to a computer and Greece has a rate just above 50%.

Figure 3: % households having access, via one of its members, to a computer



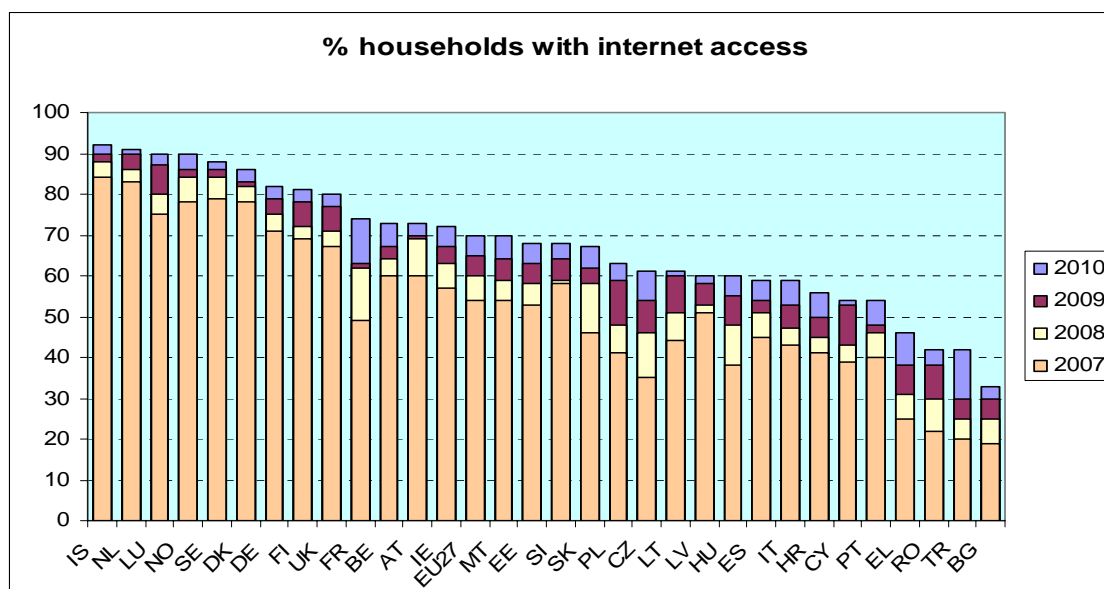
Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

Rates of household **internet access** are similar to rates of computer access across European countries (with a correlation of 0.99) with 70% of EU households having access to the internet in 2010. As with computer access, the highest rates of internet access are observed in

⁶ 2010 data for Iceland are not available.

Iceland, the Netherlands, Norway, Luxemburg and Sweden (around 90%). The lowest rates are observed in Greece, Romania, Turkey and Bulgaria (all below 50%). As with computer access, household internet access is still showing positive growth, in some countries substantially so (TR, FR, EL, CZ).

Figure 4: % households with internet access



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

The most popular **device for internet access** remains the desktop or laptop computer with on average 68% of households in the EU accessing the internet in this way (up from 63% in 2009), mostly via broadband (61%). However, the importance of access via other devices is also increasing, especially for mobile phone access. On average 15% of EU households now access the internet via mobile phone, an increase of 4pp. over 2009. In some countries, rates have reached more than 30% (DK, NL, SL, SK and SE) and in Norway the rate has reached 45%. Furthermore, access via games consoles (7% in EU) and TV (4% in EU) is also on the rise. They are of particular importance in some of the most advanced ICT countries, showing that these countries not only have higher rates of access to the internet but also use a larger variety of devices for doing so.

Looking at households without access to the internet, the most important **reason for not having internet access** at home is lack of interest (40% of households with no internet access). The next most important factors are lack of skills (32%) and equipment (26%) and access (23%) costs. Lack of skills as a reason has increased in importance compared to 2008 (+8pp.) Only 15 % say they do not have access at home because they have it elsewhere. Another 12% say they do not want it (because of harmful content etc.), 6% say it is due to privacy and security concerns, 2% due to a physical disability and 20% state "other reasons". From a cross-country perspective, access and equipment costs are considered particularly important in BG, EE, LV, HU, RO, MK and TR. Access elsewhere is an important reason in Latvia. Furthermore, more than two thirds of households without internet access in DK, DE, ES, LT, LU, HU, PL, SI, SK, FI, SE, IS and HR still find no value in having internet access. An expressed lack of internet could relate to a number of things: lack of knowledge and skills, a genuine lack of interest, or lack of appropriate offer or not wanting to report financial reasons. Rates of households without internet access reporting that lack of skills is a reason

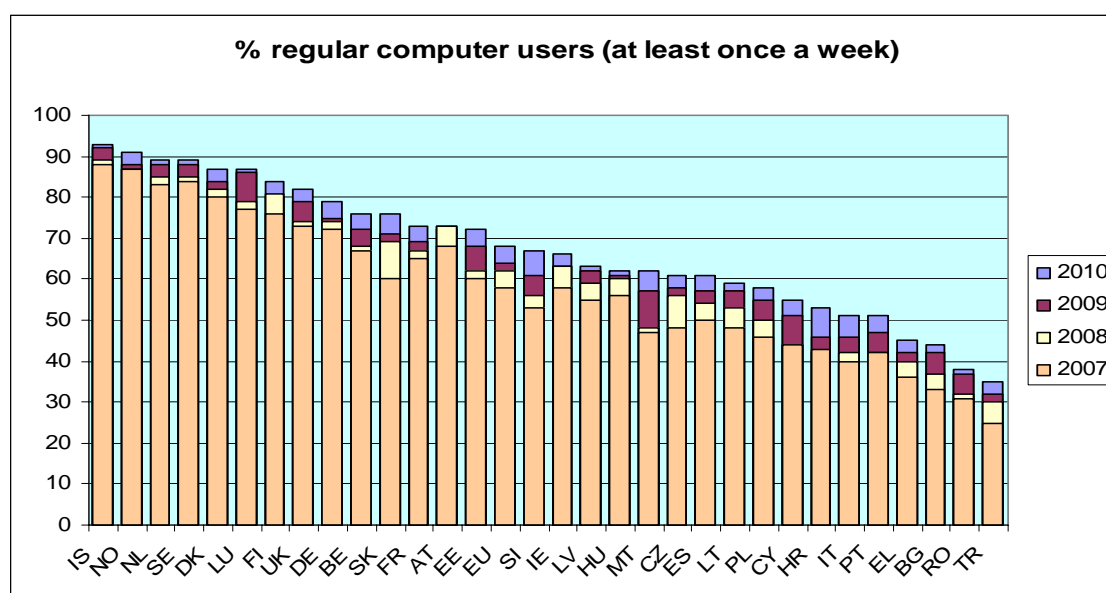
for no internet access at home are very high in a number of countries: CY (68%), EE (60%), MT and SI (both 58%) and PT (52%).

4.2. Basic use/operational skills

In terms of **computer use**, the latest data for 2010 show that on average 68% of individuals in the EU use a computer at least once a week, and most (57%) of them do so every day. The correlation between regular computer use and computer access (0.95) is very high, showing that the same country patterns observed below also hold for regular computer use: highest rates of use (above 80%) are found in the Nordic countries, the Netherlands, and also the UK; lowest rates are for Turkey, Romania, Bulgaria and Greece (45% or below).

Most progress in increasing rates has been made in a number of countries that have rates of computer use near to that of the EU average e.g. Slovenia, Slovakia, and Malta. Although, Croatia has witnessed the largest increase (+7pp.), and now has a rate of regular computer use of 53%, above those of Portugal and Italy. In particular, the low rates of increase in countries like Romania, Bulgaria, Turkey and Greece mean that they are increasingly being left behind by the others.

Figure 5: % regular computer users (at least once a week)

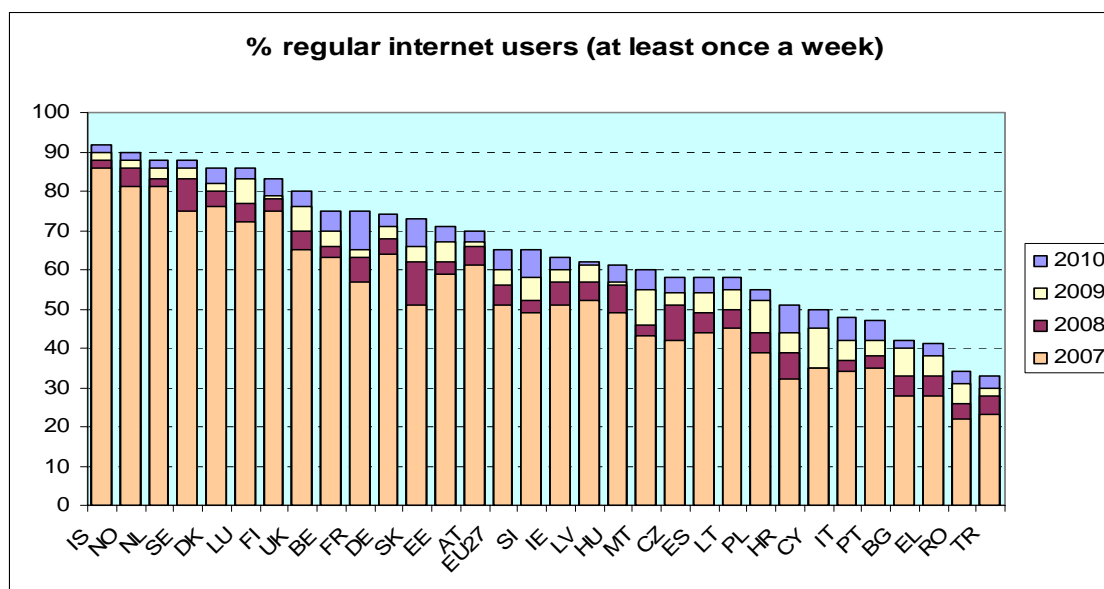


Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

Data for 2010 show that, **regular use of the internet** has increased from 60% in 2009 to 65% for the EU27. This is a significant increase in regular users and means that the Digital Agenda target for reaching 75% of regular users in the EU by 2015 is well on track to being achieved. The pattern in regular internet use across countries is very similar to that for regular computer use with a correlation of 0.97 between the two indicators. The countries with the highest rates of regular internet use remain those with historically high rates, namely: Norway (90%), Sweden and the Netherlands (88% each), Denmark and Luxemburg (86% each) and the UK (80%). However, a number of previously average scorers on this indicator have made large improvements in regular internet use over the last year and are catching up with the leaders. These include, in particular, France (+10pp. to 75%), Slovakia and Slovenia (+7pp. to 73% and 65%, respectively) and Belgium (+5pp. to 75%). Other significant increases in rates

have been witnessed in Croatia (+7pp., non-EU), Italy (+6pp.), Cyprus (+5pp.) and Portugal (+5pp.), though still only record around 50% regular internet use. On the whole, the countries with the weakest performance are also those with the lowest rates i.e. Turkey (non-EU), Romania, Greece and Bulgaria. These countries are at increasing risk of being left behind.

Figure 6: % regular internet users



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

Furthermore, rates of **non-use of the internet** have also decreased substantially over the last year. On average in the EU, the rate of non-users fell 4pp. to 26%. Again this represents a strong contribution to achieving the Digital Agenda target of halving the proportion of the population that has never used the internet by 2015 (to 15%) and means that this target is well on track to being achieved. Improvements were made in all countries analysed. Nevertheless, there remain a number of countries in Europe for which a substantial proportion of the population has still never used the internet. Over 50% of the population in Bulgaria, Greece, Romania and Turkey and more than 40% in Italy, Cyprus, Portugal and Croatia have never used the internet. By contrast, in the Nordic countries, the Netherlands and Luxemburg rates of non-users have fallen to between 5 and 11%.

In terms of **(basic) internet skills**⁷, data for 2010 show that the percentage of individuals having at least some level of skills (i.e. those with high, medium or low) has reached 72% in 2010 up from 60% in 2007. This represents a significant improvement in the internet skills of

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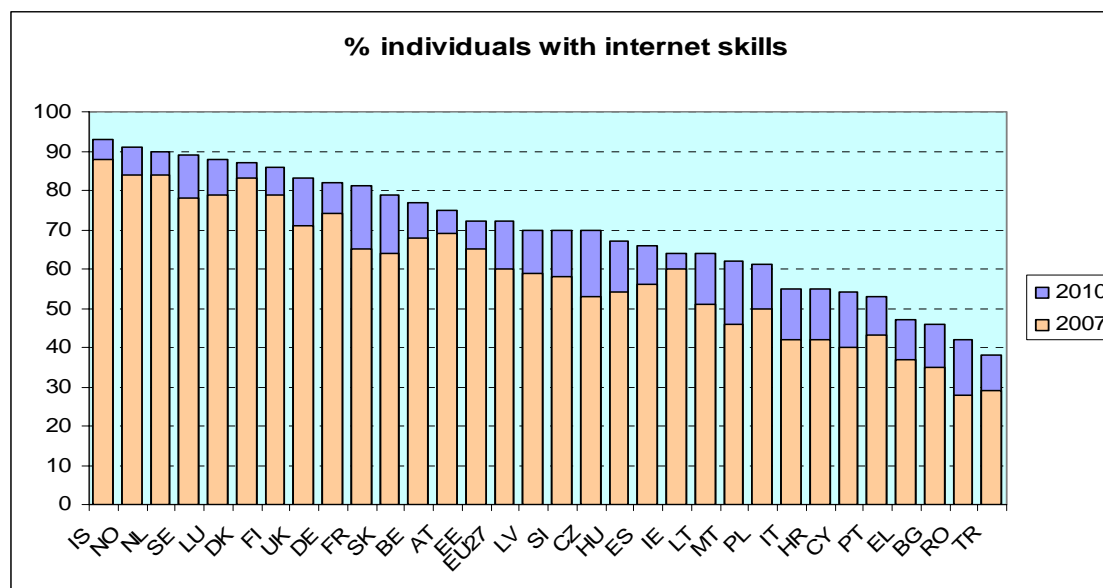
Each year the survey asks questions related to either 6 different internet or computer related skills. In 2010 it was internet skills, the previous time it was asked was in 2007. The skills included were the percentages of individuals who had:

- used a search engine to find information;
- send an email with attached files;
- posted messages to chat rooms, newsgroups, or an online discussion forum;
- used the internet to make a phone call;
- used peer-to-peer file sharing;
- and, created a web page.

Individuals who have performed 1 or 2 of these tasks are considered to be low skilled; those with 3-4 are medium skilled and those with 5-6 are high skilled.

the EU population over the last few years. Encouragingly, above average increases in skills can be observed in a number of countries that have previously been average or weak performers in terms of internet skills. The largest increases have occurred in the Czech Republic (+17pp. to 70%), France and Malta (+16pp. to 81% and 62%, respectively), Slovakia (+15pp. to 79%), Cyprus (+14pp. to 54%), and Hungary, Lithuania, Italy and Croatia (+13pp. to 67%, 64%, and 55% for the latter two). Nevertheless, the leaders remain the Netherlands, the Nordic countries (FI, SE, DK, IS, NO), and Luxemburg. Indeed the cross-country correlation between regular internet use and (operational) skills is 0.99.

Figure 7: % individuals with internet skills

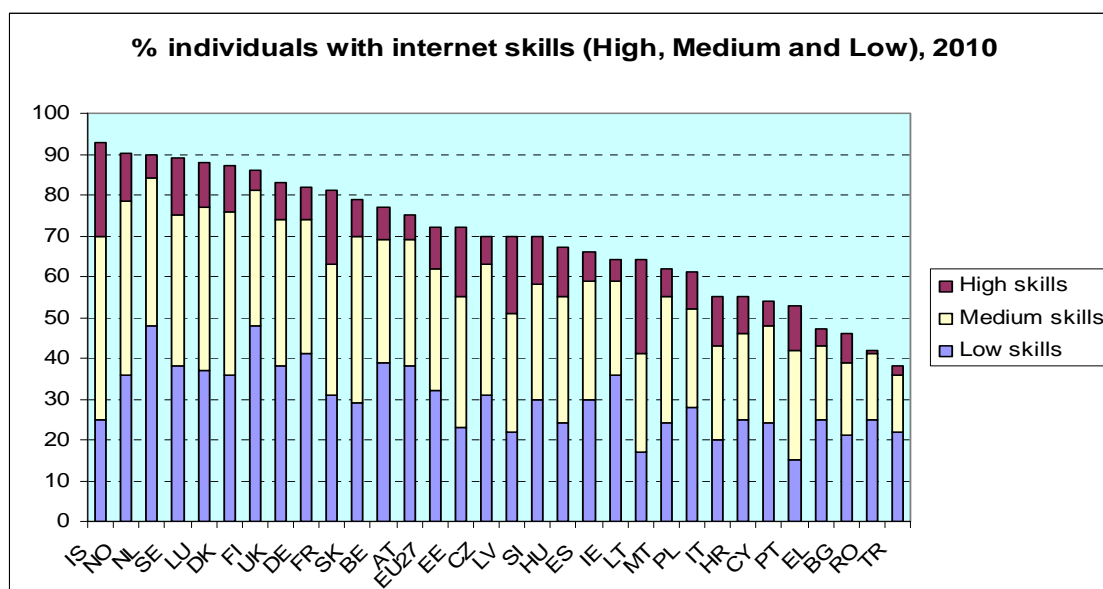


Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

While no data on **(basic) computer skills** are available for 2010, the historically strong correlation that exists between computer and internet skills allows us to infer a similar pattern in the distribution of computer skills throughout Europe.

Now looking at **different levels of internet skills**, it can be seen that for the EU27 32% have low level skills, 30% have medium level skills and 10% have high level skills. Among the Member States and other countries analysed. The percentages of individuals with only low level skills range from 15% in Portugal to 48% in the Netherlands and Finland (33 pp. range). Those with medium level skills range from 14% in Turkey to 45% in Island (31pp. range). And those with high level skills range from 1% in Romania to 23% in Lithuania (22pp. range). While rates of low and medium level skills to a large extent reflect the cross-country pattern of regular internet use (with correlations of 0.79 and 0.91), this is not the case for high level skills (correlation 0.37); countries with high access and basic use do not necessarily have the highest rates of high level skills. These are the countries: Lithuania, Latvia, Norway, Estonia, Sweden and France.

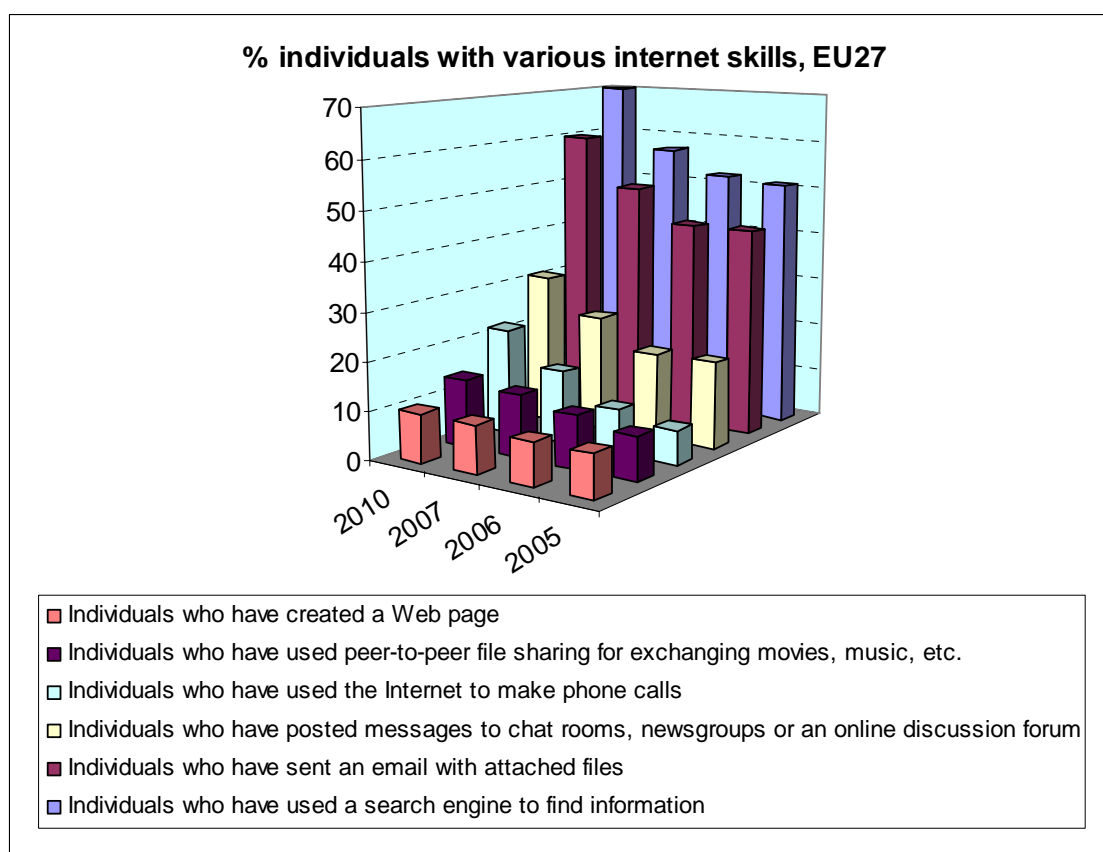
Figure 8: % individuals with different levels of internet skills, 2010



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

While this index calculates high, medium and low levels of internet skills depending on the number of listed activities carried out, it is also possible to determine levels of skill by looking at the percentages of individuals carried out each of the various activities, which themselves can be considered as varying in complexity and therefore requiring a varying level of skill. In particular, while using a search engine and sending an email with attached files can be considered as requiring relatively low levels of skill, posting a message to a chat site etc. might be considered slightly more complex and the remaining three even more so. This varying complexity is also reflected in the rates of use of these various activities. While 70% have used a search engine, 60% have sent an email with attached files, 31% have posted messages, 22% have used the internet to make phone calls, 14% have used peer-to-peer file sharing and only 10% have created a web page. Similarly, while the lower level skills have increased substantially over time, the increase in more complex tasks has been more gradual and in the case of creating a web page has remained stagnant.

Figure 9: % individuals with various internet skills



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

Summarising the main findings so far on computer and internet access, use and skills it can be said that while on average significant progress has been made in increasing rates of access, use and skills over the past year/past few years, the historically ICT advanced countries (largely encompassing the Nordic countries, the Netherlands, Luxemburg and the UK) remain the top and, with regard to access and use, most progress in catching up with them has been made in the middle ground. The countries at the bottom of the ranking, in terms of access and use, (in particular Turkey, Bulgaria, Romania and Greece) have made little progress and are being left behind by the others. In terms of skills, however, the weaker performers have made more substantial improvements. The same cross-country pattern is also exhibited by medium and low level skills, however, the countries with the highest levels of skills are more of a mixed bag. Important barriers to access and use remain lack of interest, lack of skills and access and equipment costs. Lack of skills is particularly important in a number of countries.

4.3. Active application to aspects of life or "advanced use"

This section looks at evidence for the areas work/professional life, learning, communication, participation, leisure and collaborative networking. Apart from the first area, it is mainly based on indicators on the use of the internet in the last three months for various purposes collected via the Eurostat survey of ICT use in Households and individuals.⁸

For the first area of **work/professional life**, statistics on % of employees with ICT user skills and ICT specialist skills is calculated on the basis on data collected through the European Labour Force survey.⁹

The latest data for 2010 show that 18.5% of employed persons in the EU27 have ICT user skills; 3.2% have specialist skills (the latter not being included under the concept of digital competence). These figures have changed little over time, which probably relates more to the way this indicator is measured than to the actual development in the ICT skills of the workforce.¹⁰ Despite its deficiencies, the indicator does allow us to get an idea of the pattern in skills in the workforce across countries. In particular, the highest rates of user skills within the workforce are found in Luxemburg (31%), Lithuania (25%), the UK (24%), Malta (23%), Denmark (23%), Sweden, Finland, Slovenia and Iceland (21%). The lowest rates are found in Turkey (9%), Romania (9%), Portugal (12%), Bulgaria and Greece (13%), Croatia (14%). Again, in most countries this rate has changed little over time. The proportion of ICT specialists ranges from less than 2% in Lithuania to around 5% in Finland, Sweden, Norway and the Czech Republic.

⁸ While the questions on skills analysed above usually do not stipulate a time period, but simply ask about accumulated experience and whether the individual has done any of the activities at any time of the past, skills, especially ICT skills, become quickly obsolete, therefore if one does not stipulate a time period it can not be determined whether the skill is actually still present. While three months is perhaps a shorter period than desirable, it nevertheless ensures the skill is actually present, being used and is strengthened by the evidence that most internet users go online every day, or at least every week.

⁹ The survey uses the OECD definitions of ICT user (basic + advanced) and specialist skills, as follows:
ICT specialists: they have the ability to develop, operate and maintain ICT systems. ICTs constitute the main part of their job – they develop and put in place the ICT tools for others.
Advanced users: competent users of advanced, often sector specific, software tools. ICTs are not their main job but a tool.

Basic users: competent users of generic tools (e.g. Word, Excel, Outlook, PowerPoint) needed for the information society, eGovernment and working life. Here too, ICTs are a tool, not the main job: OECD (2005), "New Perspectives on ICT Skills and Employment", OECD Digital Economy Papers, No. 96, OECD Publishing. <http://www.oecd-ilibrary.org/docserver/download/fulltext/5kz9hchrwc41.pdf?expires=1296469463&id=0000&accname=guest&checksum=324129B63568737AC7B713E3FDC52860>

The survey does not ask specific questions regarding individuals' ICT skills, but rather ICT skills are proxied by the percentage of persons employed within certain ISCO-88 job categories: <http://www.ilo.org/public/english/bureau/stat/isco/index.htm>

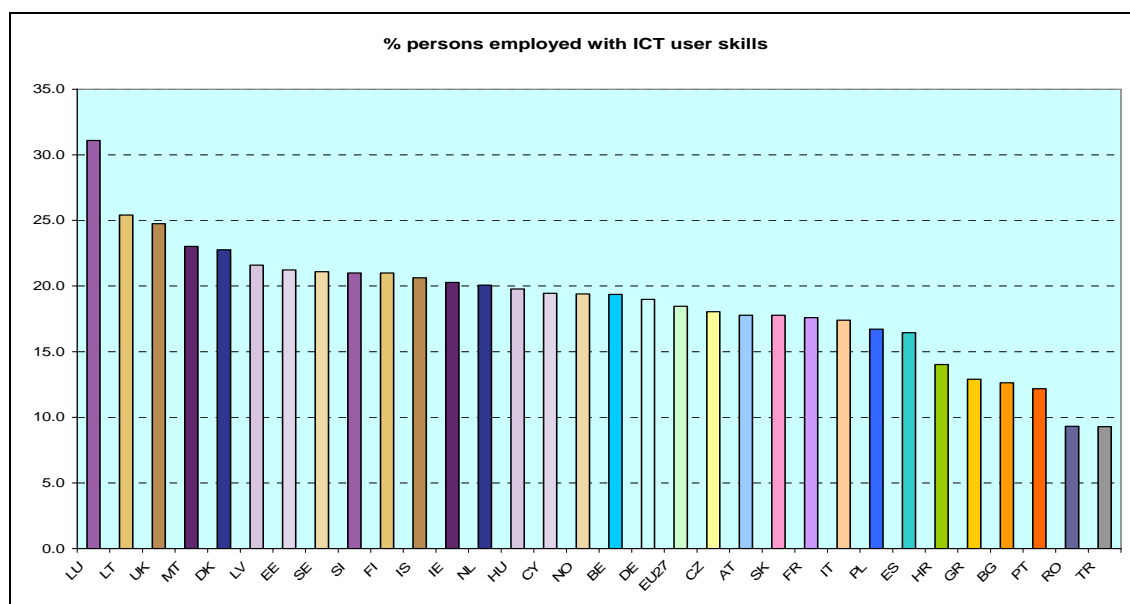
For ICT users the categories are: 121,122, 123,211, 212, 214, 241, 242, 243, 341, 342, 343, 411 and 412. For ICT specialists they are: 213, 312, 313 and 724.

As a result, these statistics do not strictly measure the ICT skills that individuals possess, but rather measure the skills that are used in employment. Therefore, in particular with regard to ICT user skills, these data are likely to underestimate the percentage of persons employed having ICT skills. In addition to this the ISCO-88 codes are from 1987 and thus do not take into account rapid changes in the working environment with regard to ICT. Recently, however, these codes were updated (ISCO-08) and they will come into use in the European Statistical System as of this year:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:292:0031:0047:EN:PDF>

¹⁰ See footnote 8.

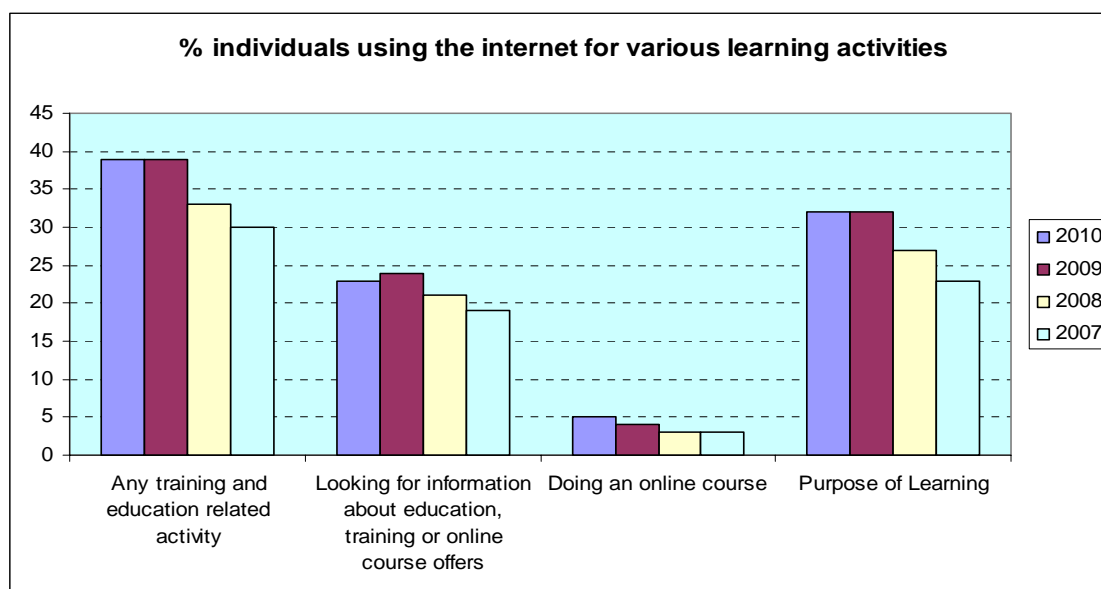
Figure 10: % persons employed with ICT user skills – 2010



Source: Eurostat European Labour Force Survey

Related to the area of **learning**, on average in the EU27 39% of individuals used the internet for any **training and education** related activity in 2010, the same as in 2009. In most countries, rates lie between 30 and 50% of individuals using the internet for this purpose. However, in Iceland, Luxembourg and Finland rates are at 70% or more. By contrast in Romania, Turkey and Bulgaria, they are below 20%. Looking at the specific items related to the above training and education indicator, 23% of individuals in the EU27 use the internet for **looking for information about education, training or online course offers**. Highest rates are found in Iceland (43%), Luxembourg and Denmark (40% each), but also in Spain (34%), Finland (33%), the Netherlands (32%), Malta (32%) and Norway (32%) rates are above 30%. The lowest rates are to be found in the Czech Republic (8%), Cyprus (9%) and Turkey (10%). In particular, the rate of individuals using the internet for this purpose has risen over the last year in Malta and Slovenia (+6pp. to 32% and 27%, respectively). **Doing an online course** remains an activity done by a minority (only 5% in the EU27). Although in Slovakia (32%) and Finland (14%, +1pp.) it is significantly more popular. Finally, the percentage of individuals in the EU using the internet **for the purpose of learning** lies at 32%. Rates are highest in Iceland (71%), Finland (67%), Luxembourg (65%), Norway (57%) and Denmark (56%) and lowest in Bulgaria (5%), Turkey (14%), Romania and Slovakia (17%, each).

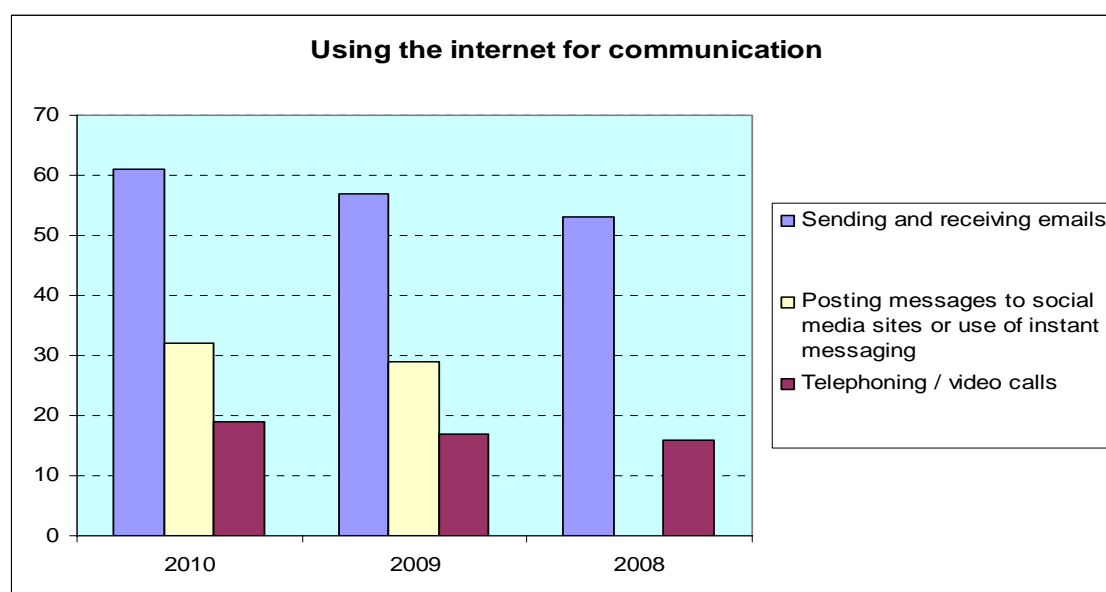
Figure 11: % individuals using the internet for training and education related activities



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

In terms of **communication**, sending and receiving emails, while always a popular activity continues to grow with the growth in internet users. According to 2010 data 61% of individuals use the internet for **sending and receiving emails**. The highest rates are to be found in the ICT advanced countries of Northern Europe: Iceland and the Netherlands (87% each), Norway (85%), Sweden (84%), Denmark (83%), and Finland (77%); as well as in Luxemburg (83%). In particular, France (+12pp. to 72%) and Slovakia (+9pp. to 70%) have exhibited large increases in email use in 2010. Lowest rates of use are in Turkey (27%), Romania (31%), Greece (32%), Bulgaria (35%), Croatia (40%), Cyprus (41%), Italy (43%) and Portugal (45%). In terms of **telephoning and video calls** over the internet, 19% of individuals in the EU27 did this in 2010, up from 17% in 2009. Interestingly, this activity is most popular in Slovakia (41%), Lithuania (39%), Latvia (35%), Estonia (34%), Iceland (33%) and Denmark (32%). It is least popular in Greece (10%), Spain and Portugal (13%), Italy, Slovenia and Croatia (14%) and Finland (15%). This shows a very different pattern of use to email and internet use generally. **Posting messages to chat sites, blogs, social networking sites, newsgroups, online discussion forum or use of instant messaging** increased from 29% in 2009 to 32% in 2010 for the EU27. This activity is most popular in Sweden (46%), Denmark (45%), Iceland (43%) and Finland (42%), but also in Poland (42%) and Lithuania (41%). Lowest rates are to be found in Romania (17%). Again this shows a very different cross-country pattern to general internet use and email.

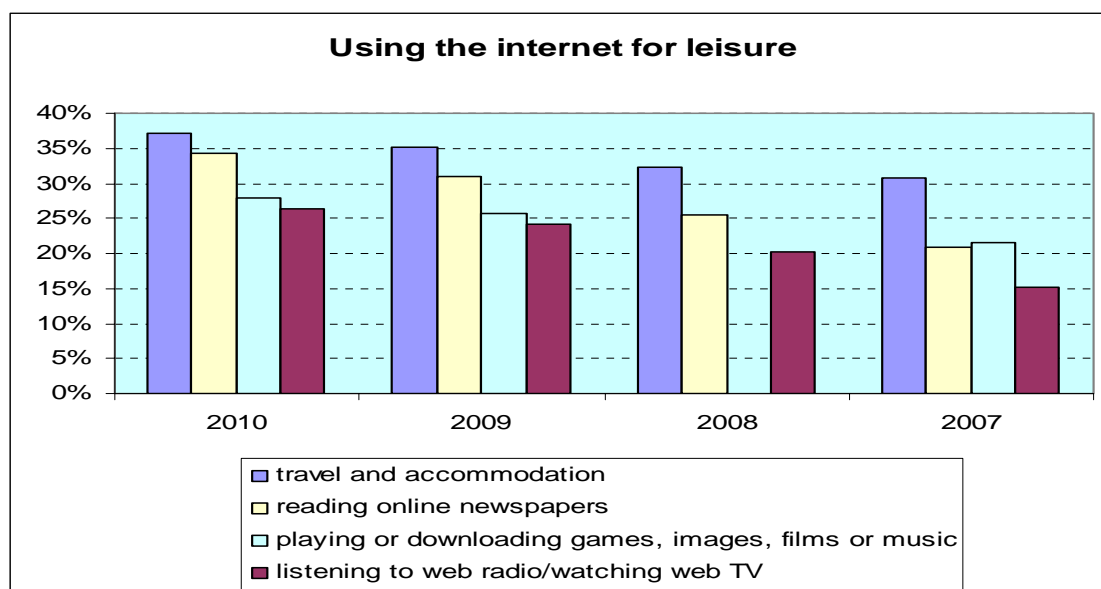
Figure 12: % individuals using the internet for various forms of communication



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

For the area **Leisure**, using the internet for **services related travel and accommodation** is the most popular of the leisure activities with 37% of EU citizens having used the internet for this purpose in 2010, up from 35% in 2009. In Denmark, Finland, Luxemburg rates are the highest at about 60%. At the other end of the scale the internet is used least for this purpose in Turkey (9%), Bulgaria (12%), Portugal (14%), Romania (16%) and Poland (17%). Next comes **reading online newspapers**, with 34% of individuals in the EU carrying out this activity in 2010, up from 31% in 2009. Of the EU and non-EU countries analysed, this activity is most popular in Norway (78%), Finland (74%), Estonia (66%), and Denmark (63%). It is least popular in Poland (17%), Bulgaria (20%), Ireland (21%), and France (21%). **Playing and downloading games, images, files or music** has reached 28% in the EU in 2010, up 2pp. from 2009. This activity is somewhat more popular in the advanced ICT countries of Northern Europe (IS, NO, FI and DK) as well as in Estonia, Luxembourg, Latvia and the Netherlands where rates are over 36%, and substantially less popular in Austria, Greece, Italy, Croatia and Turkey where they are below 20%. **Listening to web radio/watching web TV** is also an activity now performed by more than a quarter of the EU population (26% in 2010) and in some countries rates are above 50% (SE, NL, IS, NO). The lowest rates of use, around 15%, are recorded for Romania, Austria, Turkey and Italy.

Figure 13: % individuals using the internet for various leisure activities



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

For the last two aspects, **participation in society** and **collaborative networking**, there is currently no adequate data available. However, as of next year the household survey will include indicators of political participation online.

The data analysed in **this section has shown** that the most popular activities under each aspect exhibit cross-country patterns similar to diffusion rates for general internet use and email; However, some less diffused activities show quite a different pattern; with highest rates of use for certain activities, or highest rates of competence in these activities, being displayed in countries that are not necessarily the most advanced generally in terms of ICT. It has also highlighted the lack of appropriate data available for measuring certain aspects.

4.4. *Personal attitudes*

While we do not have direct measures of the personal attitudes required to be digitally competent, some can be proxied. In particular, responsible use is proxied by: "I use any kind of IT security software or tool (anti-virus, anti-spam, firewall, etc.) in order to protect my private computer and data". Confident use is proxied by online banking, as this activity requires both technical skill and trust, as well as buying goods and services online. Finally, creative use is proxied by data on the uploading self-created content and creation of web pages.

In the EU27, a majority of individuals use IT security software to protect themselves (60%), indicating a very high degree of **responsible use**. While rates are above 70 and 80% in some countries (NL, NO, IS, SE, FI, DK, UK, DE, FR and BE) in others (TR and RO) they are less than half the EU average (though still high relative to rates of internet users in those countries).

Internet banking is carried out by 36% of individuals in the EU, indicating that a majority of internet users in the EU are **confident users**. Highest rates are observed in the Nordic countries (NO, 83%; IS, 77%; FI, 76%; SE, 75%; DK, 71%), the Netherlands (77%) and

Estonia (65%). Lowest rates are observed in Bulgaria (2%), Romania (3%), former Yugoslav Republic of Macedonia (4%) and Turkey (6%). In particular, France saw a large increase in internet banking in between 2009 and 2010 (+11pp. to 53%), corresponding the large increase in regular internet use observed in this country over the last year. Similarly, 40% of individuals in the EU have ordered goods or services for private use in the previous 12 months. Highest rates are found in many of the Nordic countries (NO, 71%; DK, 67%; and SE, 65%) and the Netherlands and UK (both 67%). Lowest rates are in RO (4%), BG and TR (5%), LT (11%), EL (12%) and PT and IT (15%).

Finally, turning to **creative use**, 22% of individuals in the EU upload self-created content in 2010, showing that creative use by individuals is still only carried out by a minority (about 1/3) of internet users. Having said this, the figure has doubled in only two years. Highest rates of creative use are found in Island (41%), Latvia (39%), Denmark (37%), Luxemburg (35%), Hungary (34%) and the UK (32%). Relatively lower rates (around half the EU average or less) are observed for the Czech Republic (6%), Slovakia (9%), Greece (10%), Croatia, Poland and Turkey (11% each), and Malta and Bulgaria (12%). Furthermore, only 10% of individuals in the EU have created a web page. Highest rates are found in Iceland (34%), DK (23%), FI (19%), LU (18%), NL (17%), and SE and NO (16% each). Lowest rates are for TR and RO (1% each), CY (3%), BG, EL and IE (4% each), and CZ (6%).

Good proxies for **legal and ethical principles** and **critical/reflective attitude** are currently unavailable.

4.5. *eInclusion: the social inclusion perspective*

Thus far we have talked about digital competence from the cross-country perspective. However, the social inclusion aspect of digital competence is an important one. Many people belonging to disadvantaged social groups also tend to be disadvantaged in terms of their access to and use of the internet. While, ICT can offer such groups opportunities to help overcome their disadvantage, provided they have access to ICT and sufficient digital competence. As such the digital agenda has a target also for the use of the internet by disadvantaged people; namely to increase their regular use of the internet to 60% by 2015.

Data for 2010 show that the **regular internet use of the digitally disadvantaged**¹¹ has increased to 48%, from 42% in 2009. As such the above eInclusion target is well on the way to being achieved already after only one year. Furthermore, the improvement for this group is larger than that for the average population, showing that disadvantaged individuals are indeed catching up. Nevertheless, age and education still play a large role in determining internet use. While 90% of 16-24 year olds are regular internet users, only 46% of 55-64 year olds and 25% of those 65-74 fall into this category. Similarly, only 44% of the low educated, where as 90% of the high educated, use the internet regularly. Needless to say, rates of regular internet use by the low educated old (55-74) are extremely low (20%). While these are the main

¹¹ For the measurement of the Digital Agenda target, disadvantaged people include three main groups of individuals: those over 55 years of age, the low educated (ISCED 0-2), and those that are out of the labour market (the inactive, retired and unemployed). While other socially disadvantaged groups such as the disabled, those on low incomes, people living in thinly populated and women are also the target of eInclusion policy, these three groups constitute those which have been shown to be most disadvantaged in terms of their access and use of the internet and taking these three groups we are able to cover a large proportion of the eExcluded, as individuals often belong to more than one disadvantaged group.

determining factors, there are also important differences by employment status and population density. Also, other disadvantaged social groups such as those on low incomes, the disabled and those living in thinly populated regions are also affected.

Turning to the other aspects of digital competence, similar socio-economic patterns exist for **ICT access, basic use and operational skills** (in addition to regular internet use looked at above). Such differences also exist for the various internet activities included under "**active application to life**" or "**Advanced use**". Indeed these aspects were analysed in the 2010 digital competitiveness report and as such will not be analysed again in detail here. There it was found that, in addition to important divides related to age and education, while women exhibit similar rates of regular use and skills as men their level of skills tends to be low and medium – i.e. there is a significant gap in high level skills. Rather, we now turn to the analysis of "personal attitudes" by socio-economic group.¹²

As mentioned earlier, in the EU27 a majority of individuals used IT security software to protect themselves (60% in 2010), showing a high degree of **responsible use** (considering the group of internet users, the proportion is 84%). Interestingly, the youngest age group (16-24) are the most responsible with 79% doing so. By contrast only 43% of 55-64 year olds and 24% of 65-74 year olds do so. Similarly, there is a large education divide: the low educated are half as likely to protect themselves with IT security software than the high educated. Unsurprisingly, the low educated old are the least likely to protect themselves and are therefore putting themselves at a high level of risk and vulnerability. Regional differences and differences between the sexes are less marked.

There are also noticeable differences in **Creative use** of the internet by different social groups, in particular by age. 47% of those aged 16-24 upload self-created content. This falls to 10% for those aged 55-64 and to 5% for those aged 65-74. Education is also a factor, though differences are less (high educated 31%, low educated 16%). Finally, while employment status has an impact the main difference relates to students and economically inactive people. Students are more than twice as likely to upload creative content than employed or unemployed people. Also the inactive are less than half as likely to upload content than the employed/unemployed. These differences are mainly related to age. With regard to individuals who have created a web page, while 22% of those aged 16-24 have done so, the figure falls to 4% for those aged 55-64 and 1% for those aged 65-74. Again education also matters: while 17 % of the highly educated have created a web page, only 7% of the low educated have done so. Again, while employment status matters, with student exhibiting the highest rates and the inactive the lowest, as above this mainly relates to age. Other factors, such as gender, types of region et; also show differences, but they are less marked.

5. SUMMARY AND CONCLUSIONS

This chapter has looked at recent evidence on the digital competence, "...the confident and critical use of ICT for work, leisure, learning and communication", of the EU population.

The evidence shows that rates of **access to computers and the internet** have reached around 70%, and in some more advanced ICT countries they are up to 90% and still growing. Nevertheless, countries at the bottom of the access table have less than 50% access and risk

¹² Here we only look at responsible use and creative use as it is considered that the proxies for confident use are not reliable enough to allow for detailed analysis by socio-economic groups.

being left behind in the digital economy. Most access to the internet is via computers, though again in advanced countries access is also spreading to other devices such as mobile phones and games consoles as well. On the whole, interest in having an internet connection has risen substantially, though on average in the EU lack of interest is the biggest reason for not having an internet connection. This is followed by lack of skills. Lack of skills has marginally increased in importance since 2009 and in a number of countries it is by far the main reason. Access and equipment costs are still important in some countries.

In terms of basic use/operational skills, **regular use of the internet** has increased from 60% in 2009 to 65% in 2010 for the EU27. This means that the target set in the Digital Agenda for reaching 75% regular internet use by 2015 is well on track. There remain large difference in regular internet use of the most advanced and least advanced countries and little has changed at the extremes. However, some average performers have made substantial increases in the last year. A similar pattern can be seen for computer use, which is unsurprising given that most internet access occurs via a computer. Non-use of the internet has also decreased substantially over the last year. Non-use fell to 26% in 2010, from 30% in 2009. Again this represents a strong contribution to achieving the Digital Agenda target of halving the proportion of the population that has never used the internet by 2015 (to 15%). Nevertheless some countries still have over 50% of the population that have never used the internet.

72% of the EU population now has some level of **internet skills**, substantially up from 60% in 2007. Large increases were made in a number of countries, including some of those with the lowest rates of skills, showing that some catch-up is occurring. Even the more advanced countries have increased their rates of internet skills. On average, rates of low and medium level skills reflect patterns in regular internet use across countries. However, for higher level skills the pattern is more mixed.

Evidence on the digital competence aspects related to active application to life or "advanced use" show that, with regard to the area of **work**, 18.5% of employed persons have ICT user skills. Rates vary between 31% in Luxembourg to 9% in Turkey. In most countries this rate has changed little over time. Though there are measurement issues here. In terms of **learning**, using the internet for any education and training activity (39%) and in particular for the purpose of learning (32%) are popular activities. Looking for any information of education or training or course offers is less popular (23%) and doing a course online is still only performed by a small minority (5%).

With regard to **communication**, sending and receive emails is the most popular activity, with the highest rates observed in the ICT advanced countries of Northern Europe, as well as Luxembourg, though France and Slovakia have made substantial increases in the last year. Posting messages to social media sites or use of instant messaging is also becoming more popular, especially in a few countries (SE, DK, FI, LT, PL).Telephoning and making video calls is less. However, in the Baltic countries and Denmark it is significantly more popular than the average. The pattern across countries in the latter two indicators shows a very different one to general internet use and email, illustrating the importance of the multifaceted approach to measuring digital competence.

Use of the internet for **leisure** is popular in the EU; especially for using services related to travel and accommodation, but also for reading online newspapers as well as playing and downloading games, images, files or music. Even listening to web radio and watching web TV is becoming more popular. Highest rates of use for these various leisure activities tend to be in the ICT advanced countries of Northern Europe and Luxembourg.

In the final area of **personal attitudes**, it can be seen that in Europe levels of **responsible attitude** seem quite high, with the majority of individuals using IT security software to protect themselves online. Very high rates are seen in some advanced ICT countries. However, very low rates are apparent in countries like Romania and Turkey. A majority of internet users can be considered to be **confident users**, as proxied by the rates of use of online banking and buying online. The highest rates of confident users can be found in the Nordic countries, the Netherlands and Estonia. The lowest rates are observed in Bulgaria, Romania and Turkey. Finally, **creative use**, by individuals is still only carried out by a minority (about 1/3) of internet users. Highest rates of creative use are found in Latvia, Denmark, Luxemburg, Hungary and the UK; though, even here, rates are below 40% of the population.

Turning now to the issue of **eInclusion**, the 2010 data show that there remain strong socio-economic differences in access and use of computers and the internet, as well as for skills; for the most part along the lines of age, education and employment status. However, improvements are being made. In particular, in the last year, regular use of the internet by disadvantaged people increased to 48%, from 42% in 2009. As such, the Digital Agenda target for increasing the regular use of the internet by disadvantaged people to 60% by 2015 is well on track. Looking in more detail at the aspects of digital competence relating to "personal attitudes", it can be seen that, in particular, the young exhibit high levels of responsible attitude. Conversely, older cohorts show lower levels of responsible attitude. Finally, creative use shows a strongly declining age structure.

As such it can be seen that, there are still strong divides in digital use and competence in Europe both across countries and along socio-economic lines, though improvements are being made. In countries showing the lowest levels of digital competence, more needs to be done to bring individuals online. Rates of access and use are low and large proportions of their populations report lack of skills, costs and/or lack of interest as barriers to access. Those with higher rates of access and use also tend to score better on other indicators of digital competence. Though the picture is not uniform, for some aspects reflecting higher skills needs a different pattern can be observed. With regard to socio-economic divides the age and education divides remain dominant: the younger more educated are generally more digitally competent. Also, women generally have lower levels of operational ICT skills. In terms of personal attitudes necessary to be digitally competent, the young show the highest levels of responsible attitude. While they are also the most creative users of the internet, this is underdeveloped. These aspects in particular therefore deserve attention in the development of digital competence of young people. At the other end of the scale, levels of digital competence in the older/less-educated are extremely low and getting these people online remains a challenge that will need different strategies than for younger people.

Annex:

Definitions of Digital literacy, eSkills and Media literacy

Digital Literacy

In practical terms digital literacy is often taken as synonymous with basic operational ICT skills. However, in the academic literature it is taken more broadly. In particular, according to Prof. David Bawden¹³, the concept of digital literacy was introduced by Paul Glistner in his 1997 book of the same name.¹⁴ The definition he provided was: "*Digital literacy is the set of attitudes, understanding and skills to handle and communicate information and knowledge effectively, in a variety of media and formats.*" According to Bawden, Glistner's idea was broad and did not involve the enumeration of lists of particular skills, competences and attitudes but rather he explained the concept generally, as an ability to understand and use information from various digital sources, regarding it simply as literacy in the digital age.

eSkills

e-Skills is the term that has been adopted by the Commission to refer to ICT skills in the workforce and relates to the European Commission Communications "An Agenda for new skills and jobs: A European contribution towards full employment"¹⁵ and "E-Skills for the 21st century: Fostering Competitiveness, jobs and Growth"¹⁶. In its synthesis report of 2004, the European e-Skills Forum, building on the activities of the Career Space initiative, adopted a definition of the term *e-skills* covering three main categories:

- *ICT practitioner skills*: the capabilities required for researching, developing, designing, strategic planning, managing, producing, consulting, marketing, selling, integrating, installing, administering, maintaining, supporting and servicing ICT systems.
- *e-business skills*: the capabilities needed to exploit opportunities provided by ICT, notably the Internet; to ensure more efficient and effective performance of different types of organisations; to explore possibilities for new ways of conducting business/ administrative and organisational processes; and/ or to establish new businesses.
- *ICT user skills*: the capabilities required for the effective application of ICT systems and devices by the individual. ICT users apply systems as tools in support of their own work. User skills cover the use of common software tools and of specialised tools supporting business functions within industry. At the general level, they cover "digital literacy".¹⁷

¹³ Source: http://www.scitopics.com/Digital_Literacy.html

¹⁴ Glistner, P. (1997), Digital literacy, New York NY: Wiley.

¹⁵ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0682:FIN:EN:PDF>

¹⁶ http://ec.europa.eu/enterprise/sectors/ict/files/comm_pdf_com_2007_0496_f_en_acte_en.pdf

¹⁷ E-Skills for Europe: Towards 2010 and Beyond:

http://eskills.cedefop.europa.eu/download/synthesis_report_esf_2004.pdf

Thus, while *ICT practitioner skills* and *e-business skills* can be considered as more specialised ICT skills, ICT user skills are closer to the more general concept of digital literacy.

Media Literacy

The European Commission defines *Media literacy* in the following terms:

*"Media literacy relates to the ability to access the media, to understand and critically evaluate different aspects of the media and media context and to create communications in a variety of contexts."*¹⁸

*"Media literacy relates to all media, including television and film, radio and recorded music, print media, the internet and all other new digital communication technologies."*¹⁹

¹⁸ Commission Recommendation on Media Literacy in the digital environment for a more competitive audiovisual and content industry and an inclusive society (August 2009):

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:227:0009:0012:EN:PDF>

¹⁹ *Media Literacy Active citizenship in today's information society:*
http://ec.europa.eu/culture/media/literacy/docs/media_literacy_leaflet_en.pdf