

## 2. Investing in skills and qualifications

Sustaining public investment in education is a challenging task within the current economic context. Public spending on education is essential for growth and employment as a more skilled and educated workforce will support further productivity gains, innovation and wealth. Low-skilled workers, conversely, run an increasing risk of becoming unemployed in the face of labour markets that are ever more demanding in terms of skills and qualifications. Member States face different demographic<sup>15</sup>, economic and social challenges to improve the returns to their investments in education and training. Regardless, combining fiscal consolidation and growth-enhancing investment by definition requires improving the efficiency of public expenditure.

This edition of the Education and Training Monitor looks at the trends in public and private expenditure on education and training (section 2.1) and subsequently provides insights into the main outcomes of education and training in terms of skills and qualifications. Rather than defining efficiency by simply relating these investments and outcomes<sup>16</sup>, the Education and Training Monitor sheds light on various efficiency measures that have the potential to transform investments into stronger outcomes. Two examples are opening up education through new technologies and removing obstacles to have skills and qualifications recognised across borders.

Section 2.2 evaluates whether Europe is sufficiently reaping the benefits of new technologies in order to open up education to new groups of learners and to make teaching and learning more engaging, innovative and effective. Digital technologies can improve efficiency through economies of scale, expanding access to a wider number of people at lower costs. Section 2.3 addresses how transparency and recognition of skills and qualifications acquired through different learning pathways can be fostered through the implementation and further coordination of European policy instruments such as qualification frameworks, quality assurance frameworks, credit systems and tools for validation on non-formal and informal learning, paving the way for a future *European Area of Skills and Qualifications*.

### 2.1. Investing in education and training in a context of economic crisis

Spending on education is an investment in the future. EU Member States need to continue investing in education, research and innovation while pursuing the consolidation of public budgets. Underinvestment in human capital risks undermining Europe's prospect for smart, inclusive and sustainable growth in the future as underlined by the European Commission in the last three Annual Growth Surveys and the country-specific recommendations issued in the context of the European Semester<sup>17</sup>. The empirical evidence shows that Member States are tackling this challenge in different ways. Growth-friendly public expenditure is a key concern under Europe 2020<sup>18</sup> but the situation of public finance across the EU requires differentiated approaches.

A key question is how Member States have adapted their public education spending to respond to the crisis. Two kinds of indicators are considered for this purpose: (1) education expenditure in absolute values and as a percentage of GDP as a proxy for the commitment of Member States to invest in human capital and (2) education expenditure per student as a measure of the actual level of spending on educational institutions per study level. The comparison covers three to four years to encompass the 2009 drop in GDP growth and the delays in national processes to adjust public expenditure on education to recent economic trends.

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<sup>15</sup> See Table A.1 in the Annex and chapter 2 of the 2012 Education and Training Monitor on demographic change and education spending ([http://ec.europa.eu/education/lifelong-learning-policy/monitor12\\_en.htm](http://ec.europa.eu/education/lifelong-learning-policy/monitor12_en.htm)).

<sup>16</sup> There is a considerable time lag between a change in investment and its first likely effect on a particular cohort of students; and multiple measures to be considered for such an effect, whether skills, qualifications, or given benchmarks and indicators. In 2014, the JRC's Centre for Research on Lifelong Learning (CRELL) Joint Research Centre will, on behalf of DG EAC, investigate whether more sophisticated econometric models can bring to light the relationship between investment and outcomes in a more reliable and meaningful way.

<sup>17</sup> The 2013 country-specific recommendations, approved by the Council, can be found at: [http://ec.europa.eu/europe2020/making-it-happen/country-specific-recommendations/index\\_en.htm](http://ec.europa.eu/europe2020/making-it-happen/country-specific-recommendations/index_en.htm). The package was adopted by the Council on 19 June 2013. Significant amounts were earmarked in the 2014-2020 European Programme Erasmus+, the European Social Fund (ESF) and the European Regional Development Fund (ERDF) to support investments in education and training and measures to improve efficiency of education spending.

<sup>18</sup> Key areas for comparing Member States' performance are fiscal policy, long-term sustainability and taxation.

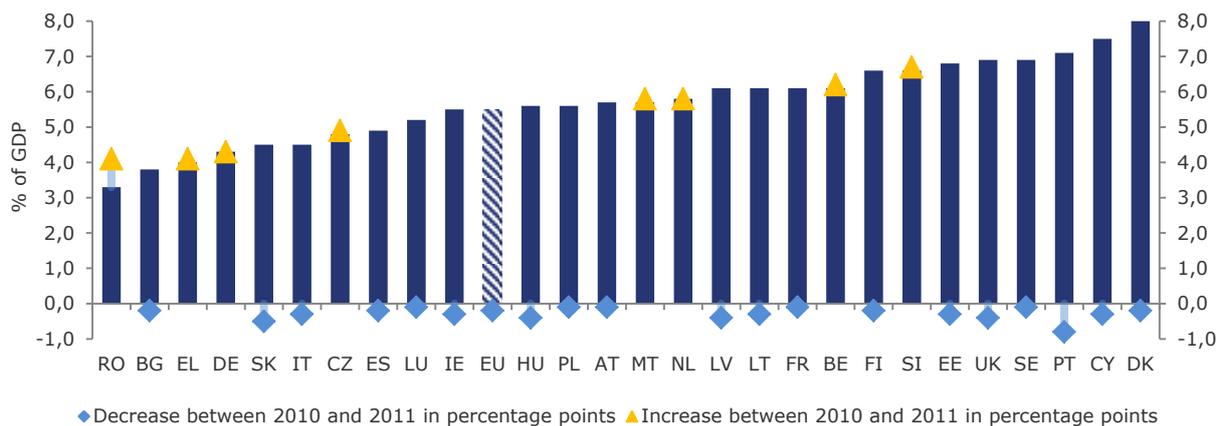
Firstly, looking at public education expenditure in real terms or as a percentage of GDP<sup>19</sup> shows that investment in education tended to shrink overall in many European countries. Evidence shows that budgets decreased further from 2011. BG, IT and RO already had decreasing values over the period 2008-2011; this was also the case for EL and SK from 2009 or 2010 (albeit not yet down to 2008 values). RO reinvested in education in 2011 although keeping to low levels.

*Sixteen Member States decreased their education expenditure at some stage between 2008 and 2011*

While eleven countries have managed to keep their spending on education at a higher or comparable level in absolute terms from 2008 to 2011 (BE, CZ, DE, FR, LU, MT, NL, AT, SI, FI and SE – see table 2.1), cuts in education expenditure were significant during this period in EE, IE, LV and HU as well as in BG, EL, IT and RO where spending levels in relation to the GDP were already low and have been cut further. DK, ES, CY, LT, PL, PT, SK and UK made cuts at some stage between 2008 and 2011 which is reflected in a reduction of education spending as a percentage of GDP in 2011. ES, PT, SK and UK had significant cuts in 2011.

The fall in education spending in recent years in these sixteen Member States represents a worrying trend and calls for strengthening the efficiency of education investment and supporting innovation and competitiveness<sup>20</sup>. This is of particular relevance in the context of limited GDP growth forecasts for 2014.

Figure 2.1. Public expenditure on education as a percentage of GDP (2010- 2011)<sup>21</sup>



Source: Eurostat (Government finance statistics; online data code: gov\_a\_exp). Notes: No comparable data for HR. Countries are ranked in ascending order according to public expenditure on education in % of GDP in 2010.

More recent figures available at national level<sup>22</sup> show that the budget continued to decrease by more than 5% between 2011 and 2012 in six of the sixteen Member States mentioned above for all education levels (EL, IT, CY, LV, PT, UK-WLS) as well as in HR and for tertiary education in two other Member States (CZ, IE). Education spending increased by 5% or more only in BE (German speaking Community), LU and MT. These trends, as well as changes in 2013 national budgets, explain why, in the context of the 2013 European Semester, it was recommended pursuing or implementing growth-friendly policies in BG, EE, HU, LT, IT, RO, FI, SE and UK; improving the efficiency of public spending in DE, FR, and SK; and protecting growth-enhancing expenditure in future budgets in MT, NL, PL and SI.

<sup>19</sup> Eleven Member States had a level of public education spending below the EU average of 5.3% of GDP in 2011 (BG, CZ, DE, IE, EL, ES, IT, LU, HU, RO and SK). On the other hand, in some Member States public expenditure on education exceeded the average by a considerable margin. It was between 6% and 7% of GDP in BE, EE, FR, PT, SI, SE, FI and UK. In CY, expenditure even amounted to 7.2% and in DK to 7.8% of GDP.

<sup>20</sup> COM(2013) 350 final.

<sup>21</sup> Based on breakdowns of expenditure data according to the Classification of the Functions of Government (COFOG). According to the COFOG, education expenditure covers pre-primary, primary, secondary and tertiary education, education not definable by level, subsidiary services to education and R&D in education.

<sup>22</sup> Eurydice (2013), *Funding of Education in Europe, 2000-2012* (changes in budgets in constant prices).

*BG, ES, HR, IT, LV and RO cut down on all levels from primary to tertiary education*

Secondly, when looking at public education expenditure per student and by education level<sup>23</sup>, data availability allows only for a 2008-2010 analysis. Nevertheless, the concerns expressed above were already visible before the real impact of the crisis on education and training budgets. On average, Member States spent about 6,900 € per student in 2010 (about 9,600 € per student in tertiary education compared to about 5,100 € for primary and 6,100 € for secondary education). Education spending per student was down in seven Member States between 2008 and 2010 when considering averages for all educational levels (Figure 2.2). This was the case in countries with existing low levels like BG, HR, IT, LV and RO as well as in ES for primary, secondary and tertiary education.

Overall education spending per student was also down in EE although the decrease concerned primary education. In nine other Member States, spending per student decreased for certain educational levels only. This was the case in BE, CZ, CY, NL, AT and SE for tertiary education (see Table 2.1), in CY, LT, LU and AT for upper secondary education, and in SI for primary and lower secondary education.

**Table 2.1. Government expenditure on education (2008-2011) and annual expenditure per student in € PPS (2010-2008)**

	Government expenditure on education in absolute terms		Expenditure on educational institutions					
	change 2008-2010 %	change 2010-2011 %	Primary and lower secondary		Upper secondary and post-secondary non tertiary education		Tertiary	
			in € PPS / student 2010	change 2008-2010 %	in € PPS / student 2010	change 2008-2010 %	in € PPS / student 2010	change 2008-2010 %
European Union	4.5	0.4	6,131	6.9	7,128	3.0	9,638	3.5
Belgium	6.4	5.1	6,818	2.2	8,476	3.1	11,691	-0.5
Bulgaria	-6.3	2.1	2,190	-6.2	2,148	-4.8	3,763	-22.1
Czech Republic	4.8	5.6	4,136	9.9	4,464	6.2	5,881	-5.8
Denmark	16.2	-1.0	8,598	8.2	9,177	5.0	14,617	5.8
Germany	8.9	3.1	6,240	15.6	8,373	4.3	12,357	2.6
Estonia	-10.3	5.7	4,108	-7.3	5,355	9.9	5,038	11.9
Ireland	-9.7	-3.6	:	:	:	:	:	:
Greece	-7.3	-4.4	:	:	:	:	:	:
Spain	3.0	-2.3	6,207	-0.3	7,938	-8.5	10,301	-1.3
France	8.7	2.1	6,039	4.0	9,825	4.1	11,606	4.8
Croatia	:	:	3,285	-3.8	3,485	-3.8	5,233	-28.4
Italy	-0.2	-3.2	6,467	-8.4	6,660	-6.5	7,379	-1.1
Cyprus	11.2	-0.5	9,260	9.1	10,849	-0.4	9,933	-4.0
Latvia	-27.1	5.5	3,533	-15.1	3,365	-19.2	4,315	-12.0
Lithuania	-10.0	6.3	3,295	4.1	3,291	-7.0	5,066	6.9
Luxembourg	19.0	5.1	15,262	19.6	13,203	-15.5	:	:
Hungary	-2.1	-4.7	:	:	:	:	:	:
Malta	16.5	5.1	7,713	23.3	5,444	1.3	11,719	21.0
Netherlands	5.9	1.2	7,279	7.1	9,048	2.2	13,219	-4.9
Austria	7.5	2.4	8,774	7.6	9,136	-1.9	11,895	-3.1
Poland	-3.9	2.6	4,279	20.2	3,735	15.9	5,951	28.5
Portugal	13.9	-11.3	4,684	10.9	6,258	8.6	7,742	6.9
Romania	-33.5	30.5	1,674	-24.6	1,680	-20.2	2,956	-19.5
Slovenia	3.6	2.4	6,971	-2.3	5,670	3.1	7,296	14.0
Slovakia	31.4	-5.2	4,168	35.8	3,466	5.6	5,318	3.7
Finland	7.2	3.0	6,997	5.2	6,094	4.3	12,874	6.7
Sweden	5.8	9.1	7,634	4.4	7,945	1.7	15,068	-4.0
United Kingdom	2.1	-3.6	7,585	8.6	7,642	6.1	12,781	7.1

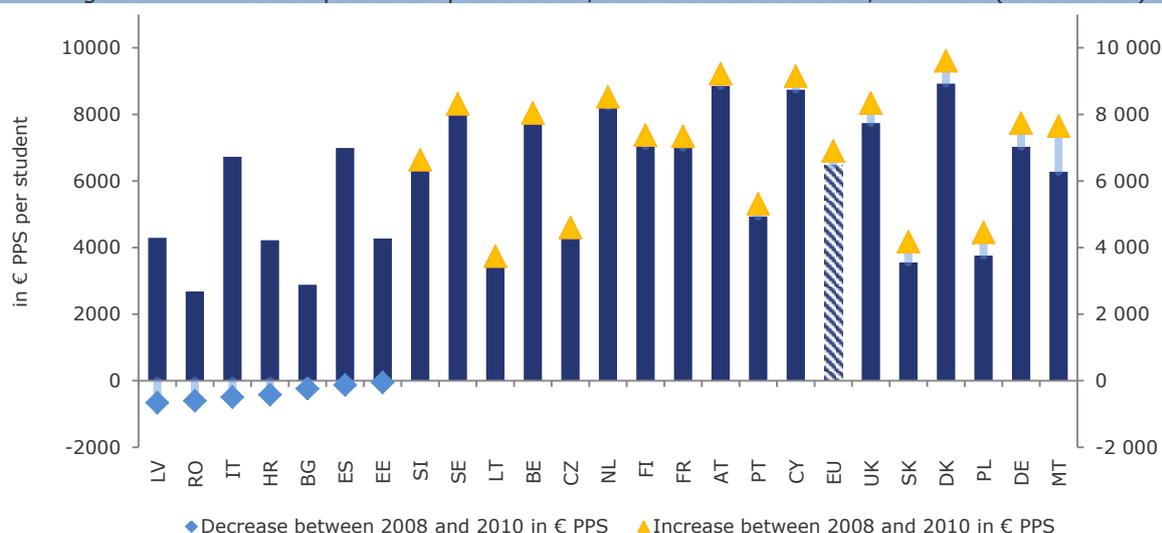
Source: Eurostat (Government finance statistics; online data code: gov\_a\_exp and UOE; online data code: educ\_fitotin). Notes: See Eurostat on line metadata for a precise definition of education expenditure in each source. No comparable data for HR on Government expenditure on education. PT 2009 data are used for expenditure on educational institutions in primary and secondary education. For IT, data on expenditure on educational institutions cover public institutions only (except in tertiary education) and data excludes post-secondary non-tertiary education. EU aggregate are calculated without IE, EL, LU and HU.

<sup>23</sup> Expenditure on educational institutions per student provides complementary information on trends across education levels and Member States considering demographic factors and enrolment in educational programmes. The indicator adopted here is the annual expenditure on public and private educational institutions per pupil/student in Purchasing Power Standards, based on full-time equivalents. In 2009, 77% of this expenditure was devoted to personnel expenditure at EU level (see also Section 3.3).

In the other Member States, education expenditure per student increased or remained stable between 2008 and 2010<sup>24</sup>. However, the cuts in education spending in 2011 and 2012 are likely to impact expenditure per student particularly in tertiary education in the view of upward enrolment trends across Europe (+4.3% in the period 2008-2010, with more than 10% in BE, CZ, DE, CY, MT and AT). In 2013, efficiency gains are expected in a number of Member States as national budget priorities focussed on e.g. improving the efficiency of education administration in BG, CZ, AT, SI and UK-NIR and the employability of graduates and/or the provision of apprenticeship in BG, CZ, ES and UK-SCT<sup>25</sup>. Nevertheless, there is still a need for national debates on the funding of education and training.

*There is a need for national debates on the funding of education and training*

Figure 2.2. Annual expenditure per student, all levels of education, in € PPS (2008-2010)



Source: Eurostat (UOE; online data code: *educ\_fitotin*). Notes: For the EU28, DE and PT 2009 data are used instead of 2010 data. EU aggregate calculated without IE, EL, LU, HR and HU. Countries are ranked in ascending order according to the growth in annual expenditure per student between 2008 and 2010.

### Private spending on educational institutions

Financing educational institutions has always been largely the role of public actors across the EU. For all educational levels, public funding accounted for about 86% of investments in educational institutions in 2010. Over the last decade, the share of private funding (tuition fees paid by households/students, sponsorship by enterprises) of educational institutions increased from 11.5% of total spending on institutions in 2000 to close to 14% in 2009 for the EU as a whole.

*Tuition fees and enterprise sponsorship accounted for 14% of total spending on educational institutions*

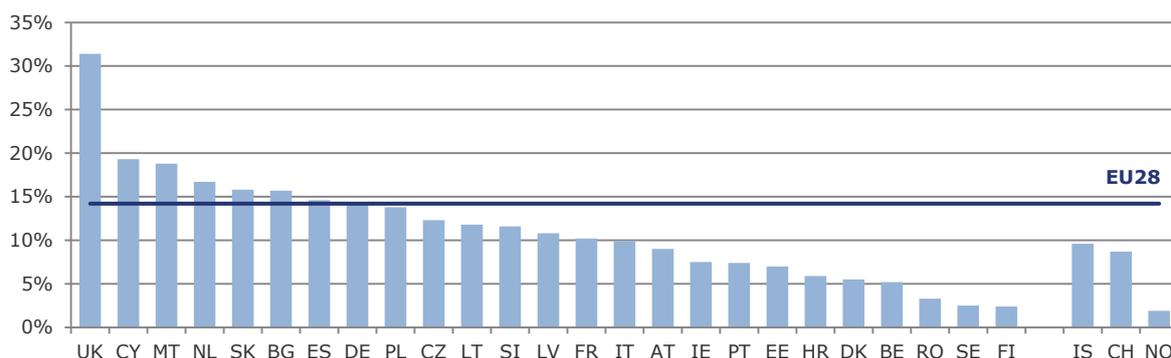
In 2010, private spending on educational institutions accounted for less than 5% of total spending in FI, SE and RO as well as in NO, but between 15% and 20% in BG, CY, MT, NL and SK. The share of private spending was as high as 31.4% in UK, close to values reached in non EU countries like the United States and Japan, which reflects the specific UK-ENG funding model for higher education. Tuition fees paid by households/students for tertiary education largely reflect the diversity and evolution of education financing models across Europe<sup>26</sup> (see chapter 4).

<sup>24</sup> See also a forthcoming JRC-CRELL report on public financing of education in EU countries (to be published at: <https://crell.jrc.ec.europa.eu>).

<sup>25</sup> Eurydice (2013), *Funding of Education in Europe, 2000-2012*.

<sup>26</sup> See also Eurydice (2013), *Funding of Education in Europe, 2000-2012* (chapter 5 on financial support to students). The figures do not take into account private spending of households on non-formal education to supplement formal education with a private tutor. See NESSE (2011), *The challenge of shadow education* for further information at <http://www.nesse.fr/nesse>. Furthermore, when examining the differences in funding of educational systems across Member States, this chapter does not address local and regional disparities. See NESSE (2012), *Mind the Gap* for

Figure 2.3. Share of private expenditure on educational institutions (2010)



Source: Eurostat (UOE). Notes: Private expenditure corresponds to transfers from private sources to educational institutions. This includes private fees for educational services as well as public funding via subsidies to households.

In relation to further use of a mix of private and public sources, the European Commission underlined the need for strengthening the knowledge triangle between education, research and business in the European Union in its Communication on *European Higher Education in the World*<sup>27</sup>. This was already the aim of recommendations made to BG, EE and SK within the context of the 2013 European Semester in order to foster effective knowledge transfer.

Private spending on educational institutions stands to face significant changes in coming years with the development of new relationships between educational institutions, households and enterprises. Significant efficiency gains can be expected with the increasing role of ICT in education and training and Open Educational Resources (see section 2.2) and with a better transferability between educational institutions, companies and sectors of skills acquired across different learning platforms and pathways (see section 2.3).

## 2.2. Opening up education and training through new technologies

Today new technologies offer unprecedented opportunities to make learning more effective, inclusive and engaging. Digital technologies can improve effectiveness of resources through economies of scale, expanding access to a wider number of people (e.g. through MOOCs<sup>28</sup> and other Open Educational Resources (OER)) at lower costs or allowing teachers to focus on what they do best by automating or offloading more routine tasks. ICT can be used to foster more creative and innovative methods of learning (including personalised and collaborative learning)<sup>29</sup>, and it has the potential to facilitate collaboration, exchange and access to learning resources.

### *A huge potential for the modernisation of education and training*

As highlighted in the Communication on *Opening Up Education*<sup>30</sup>, Europe is not fully exploiting the potential offered by new technologies and the upsurge across the globe of digital content in order to better fulfil learners' needs, cater for more individualised learning paths and offer high quality education.

### *A more advanced use of computers during lessons is still not commonplace in many countries*

Even if data from TIMSS 2011<sup>31</sup> show that the use of computers at school (in grade 4) has increased, the differences across countries remain significant. In UK-ENG nearly all grade 4 students use ICT at school, whereas in AT, LT, SI and RO less than half of the students do so. To fully benefit from the

27 further information at <http://www.nesse.fr/nesse>.

28 European higher education in the world (COM(2013) 499 final).

29 Massive Online Open Courses.

29 See e.g. JRC-IPTS (2012) *Innovating Learning: Key Elements for Developing Creative Classrooms in Europe* (<http://ftp.jrc.es/EURdoc/JRC72278.pdf>).

30 Opening Up Education: Innovative teaching and learning for all through new technologies and open educational resources (COM(2013) 654 final).

31 Trends in International Mathematics and Science Study by the IEA (<http://timss.bc.edu/>). See also Section 3.4.

potential of new technology, the question of how ICT is used in learning is even more pertinent than asking if ICT is used. With respect to science teaching, data from TIMSS 2011 show certain limitations to the level of integration of new technologies in lessons. More advanced use of computers to conduct experiments or simulations of natural phenomena is far less commonplace than other types of use during lessons<sup>32</sup>.

Results from the 2011-12 Survey of Schools: ICT in Education<sup>33</sup> show that students' frequency of ICT-based activities for learning in the classroom increase when schools have specific formal policies to use ICT in their teaching and learning and, even more importantly, implement concrete support measures at school level (such as facilitating teachers' participation in training, availability of an ICT coordinator, etc.). However, in the EU only around 30% of students at grade 4 and around 25% at the other grades (grade 8 and 11) are in such digitally supportive schools and as much as 35% of students are in schools characterised by both weak policy and weak support.

As mentioned in relation to the results from TIMSS 2011, the key issue is to really integrate ICT as a teaching and learning tool in mainstream practices, which does not simply mean more electronic devices or more broadband connections. The combination of innovative pedagogies with an effective use of digital tools and content can boost education and training in terms of quality, equity and efficiency.

Table 2.2. Use of computers in school and during science lessons (%)

	% of grade 4 students who use computers at school		% of grade 4 students using computers at least monthly during science lessons (TIMSS 2011)					
	TIMSS 2007	TIMSS 2011	To Look Up Ideas and Information	To Do Scientific Procedures or Experiments	To Study Natural Phenomena Through Simulations	To Practice Skills and Procedures		
Belgium ( <i>Flemish</i> )	:	68.8	78 (3.3)	21 (3.3)	26 (3.4)	56 (3.8)		
Czech Republic	51.1	69.6	45 (4.1)	22 (3.4)	16 (3.0)	37 (4.2)		
Denmark	78.8	79.8	71 (3.4)	25 (3.7)	37 (4.5)	45 (3.9)		
Germany	37.5	51.0	54 (3.2)	14 (2.4)	15 (2.4)	23 (2.9)		
Ireland	:	69.8	55 (3.9)	29 (3.5)	35 (3.4)	30 (3.5)		
Spain	:	60.7	33 (3.5)	21 (3.2)	20 (3.3)	29 (3.5)		
Croatia	:	26.8	13 (2.2)	7 (1.5)	5 (1.4)	12 (2.3)		
Italy	63.2	60.0	28 (3.1)	21 (2.8)	18 (2.7)	23 (2.9)		
Lithuania	21.9	37.9	45 (4.1)	30 (3.3)	21 (2.8)	41 (3.8)		
Hungary	42.9	78.1	34 (3.5)	14 (2.5)	15 (2.6)	27 (3.2)		
Malta	:	80.3	65 (0.1)	50 (0.1)	39 (0.1)	59 (0.1)		
Netherlands	83.2	85.6	58 (5.0)	13 (3.4)	16 (3.4)	27 (4.5)		
Austria	37.4	42.8	60 (3.5)	20 (2.6)	20 (2.8)	32 (3.3)		
Poland	:	56.9	16 (2.8)	7 (2.0)	11 (2.5)	13 (2.8)		
Portugal	:	59.9	46 (5.3)	29 (3.9)	30 (4.2)	39 (4.3)		
Romania	:	37.8	23 (3.5)	21 (3.2)	21 (3.3)	23 (3.5)		
Slovenia	33.3	45.3	37 (3.6)	12 (2.1)	20 (2.7)	21 (3.0)		
Slovakia	46.7	70.0	42 (3.2)	17 (2.3)	24 (2.7)	43 (3.2)		
Finland	:	80.6	59 (3.7)	17 (2.7)	15 (2.2)	42 (3.5)		
Sweden	58.5	66.8	49 (4.6)	11 (3.1)	10 (2.5)	21 (3.5)		
UK ( <i>England</i> )	85.8	96.6	68 (5.0)	40 (4.8)	51 (5.1)	43 (4.8)		
UK ( <i>Northern Ireland</i> )	:	97.3	73 (3.9)	47 (4.0)	42 (4.3)	53 (4.4)		

Source: IEA (TIMSS 2007 and 2011).

### Only 1 in 5 are taught by digitally confident and supportive teachers

The Communication on *Opening Up Education* stresses the role of teachers as key agents for such change. The results from the 2011-12 Survey of Schools underpin this. While 70% of teachers in the EU recognise the importance of training in ICT-supported pedagogies, only around 20% of students are taught by *digitally confident* and *supportive teachers* having high access to ICT and facing low obstacles to their use at school. However, the survey also shows that teachers who are highly confident and positive about the use of ICT can overcome low access to equipment and other obstacles affecting the provision of ICT use in teaching and learning.

<sup>32</sup> Similar findings from TIMSS (2007) are analysed in Eurydice report (2011), *Key data on Learning and Innovation through ICT at School in Europe 2011*.

<sup>33</sup> European Commission (2013), *Survey of Schools: ICT in Education. Benchmarking Access, Use and Attitudes to Technology in Europe's Schools* (Study carried out for the Commission by the European Schoolnet and the University of Liège).

Current experiences show that sharing and collaborating are proven to be successful in changing attitudes and introducing new innovative ways of teaching and learning<sup>34</sup>. This is demonstrated by the strong engagement of teachers in the communities of practices of the e-Learning Portal<sup>35</sup> or of the e-Twinning<sup>36</sup>, with more than 200,000 registered users and 100,000 schools. An Electronic Platform for Adult Learning in Europe is also in development. The 2011-12 Survey of Schools found that around 30% of students at grade 4, 8 and 11 are taught by teachers having participated in online communities for professional exchange amongst other teachers, there is thus scope for further strengthening teachers' participation in these collaborative practices.

The 2011-12 Survey of Schools shows that teacher training on the pedagogical use of ICT is rarely compulsory (only for 25-30% of teachers depending on the grade). Teachers' participation in courses on the pedagogical use of ICT in teaching and learning also varies considerably between countries. In LT, around 70% of students or more across all grades are taught by teachers who have undertaken such courses (with similarly high figures for one or more grades in ES, EE, SI and LV). By contrast, only around one third of students across all grades in BE are taught by teachers who have participated in these types of courses (figures of less than 30% can also be found for one or more grade in AT, LU, FR, EL and IT).

*Teacher training on the pedagogical use of ICT is rarely compulsory*

The impact and new possibilities offered by technological advances is also felt in higher education and in adult learning. As underlined in the two Communications on *European Higher Education in the World* and *Opening Up Education*, the appearance of phenomena like MOOCs is pushing for a globalisation of educational markets. In the US, the three main MOOC providers offer around 400 courses, with 3 million users worldwide, and Europe is currently lagging behind. Few European universities are providing MOOCs (e.g. only 9 are involved in Coursera<sup>37</sup>) and a recent EUA survey<sup>38</sup> shows that many European universities are not even aware of what a MOOC is. To strengthen the evidence-base in the area of technological advances in higher education and adult learning, the Commission is launching various studies this year to strengthen the evidence-base in the area of technological advances in higher education and adult learning. In order for society and individuals to make full use of the competences acquired through online learning and OER, recognition of such learning will be considered in the development of the European policy instruments (see chapter 2.3).

### *Digital competences*

If learners of all ages are to benefit fully from the opportunities for more engaging, effective and inclusive learning offered by new technologies, digital competences are a prerequisite. The 2012 Communication on Rethinking Education<sup>39</sup> emphasised the importance of building the right skills for the 21<sup>st</sup> century, and developing digital competence is part and parcel of this set of skills, knowledge and attitudes.

Recent results on 8<sup>th</sup> and 11<sup>th</sup> grade pupils' confidence in their ICT skills are available from the 2011-12 Survey of Schools: ICT in Education<sup>40</sup>. As can be seen in Figure 2.4, the results show that pupils express higher confidence in their ability to use the internet safely and lower confidence in their social media skills than in the other ICT skills they were asked about.

The analysis of the survey results finds a positive link between confidence in these ICT skills and the use of ICT at home *and* at school. Students with high access/use of ICT both at home and at school are more confident in their ICT skills than those who only report high access/use at home and not at school, or low access/use both at home and at school. These students are not only

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<sup>34</sup> See e.g. chapter 4 of European Commission (2013): Study of the impact of eTwinning on participating pupils, teachers and schools.

<sup>35</sup> See <http://www.elearningeuropa.info>.

<sup>36</sup> See <http://www.etwinning.net>.

<sup>37</sup> [http://www.eua.be/news/13-02-25/Massive\\_Open\\_Online\\_Courses\\_MOOCs\\_EUA\\_to\\_look\\_at\\_development\\_of\\_MOOCs\\_and\\_trends\\_in\\_innovative\\_learning.aspx](http://www.eua.be/news/13-02-25/Massive_Open_Online_Courses_MOOCs_EUA_to_look_at_development_of_MOOCs_and_trends_in_innovative_learning.aspx).

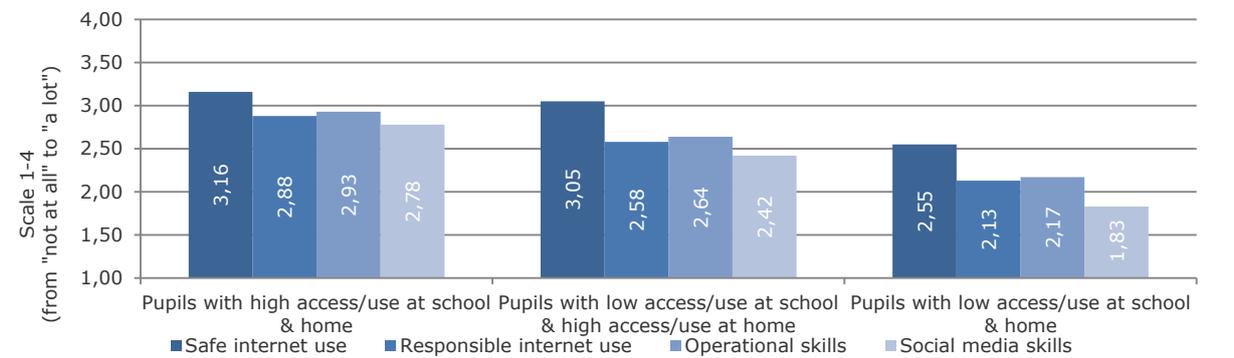
<sup>38</sup> Ibid.

<sup>39</sup> COM (2012) 669 final.

<sup>40</sup> European Commission (2013), *Survey of Schools: ICT in Education. Benchmarking Access, Use and Attitudes to Technology in Europe's Schools* (Study carried out for the Commission by the European Schoolnet and the University of Liège).

confident in their digital competences, but are also positive about the impact of using ICT in teaching and learning, i.e. they are *digitally confident and supportive students*.

Figure 2.4. Average pupil confidence in using ICT skills (Grade 8, 2011-12)

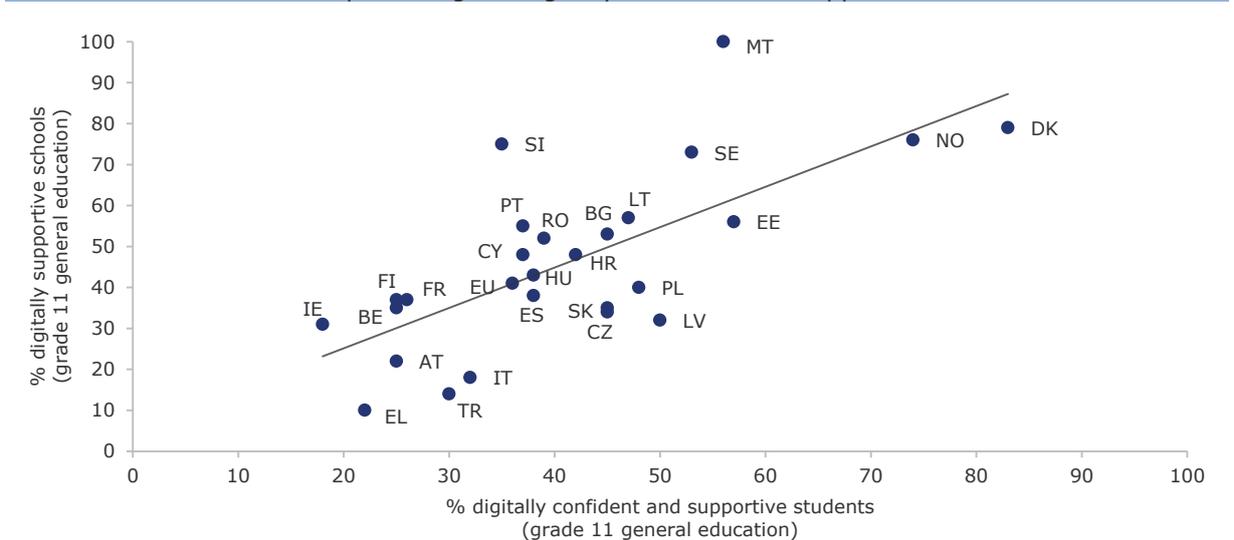


Source: European Commission (2013): "Survey of Schools: ICT in Education. Benchmarking Access, Use and Attitudes to Technology in Europe's Schools". Note: All EU28 countries are included except DE, HR, NL and UK.

*Digitally supportive schools can help foster digitally confident and supportive students*

Across EU countries, on average 30–35% of students are digitally confident and supportive students (Figure 2.5). The highest percentage of such students is observed in grade 11 general education (36% compared with 29% at grade 11 vocational and 31% at grade 8). Yet there are important variations between countries. The highest percentage is found in DK at all grades, whereas AT, BE, FI and IE are amongst the lower five countries for both grade 8 and grade 11 (general education). The results from the survey also demonstrate that educational systems with a high percentage of digitally supportive schools include a large percentage of digitally confident and supportive students. This is particularly clear for grade 11 general education, as shown in Figure 2.5.

Figure 2.5. Mapping of countries according to their percentage of students in digitally supportive schools and percentage of digitally confident and supportive students



Source: European Commission (2013): "Survey of Schools: ICT in Education. Benchmarking Access, Use and Attitudes to Technology in Europe's Schools". Note: The plot covers grade 11 of general education, 2011-12. All EU28 countries are included except DE, HR, NL and UK.

The Commission proposes in the Communication on Opening up Education to develop – in close cooperation with stakeholders and Member States – digital competency frameworks, including a

self-assessment citizens' tool<sup>41</sup>. Such instruments would further support policy development to foster competences and to facilitate documentation of digital competences, e.g. for validation and recognition purposes. The importance of transparency and recognition of what individuals know and can do is discussed more widely in the subsequent section.

One in four adults in the 17 EU Member States that participated in the Survey of Adult Skills (PIAAC) showed very low to no skills in problem solving in technology-rich environments. This consists of 14% that could only perform very simple tasks (below proficiency level 1) and another 13% that lacked any computer experience or had such low levels of proficiency that they could not take the computer based test.

The Survey of Adult Skills also showed that the use of ICT both at work and at home is one of the strongest determinants of reading literacy skills, just after education attainment. The more individuals tend to engage in the use of information communication technology, the higher their literacy skills and vice versa. Good literacy skills ease the use of ICT for retrieving and using information, while frequent ICT use may contribute to improving or at least maintaining literacy abilities. Further results from the Survey of Adult Skills are discussed in section 6.1.

### 2.3. Tools for transparency of skills and qualifications

In the last decade, several European policies and instruments have been developed and are being implemented in the context of the ET 2020 strategic framework and the Bologna process that aim to support the mobility of learners and workers through better transparency and easier recognition of what they know and can do. Providing individuals with the opportunity to develop their skills in a flexible way and have those skills clearly understood and recognised across borders (both sectorial and geographical) will reduce skills mismatches and increase the efficiency in education and training systems.

European *qualifications frameworks* (EQF<sup>42</sup> and QF EHEA<sup>43</sup>) based on a learning outcome approach provide a reference point for the comparison of individual qualifications and qualification systems across countries. European *credit systems* (ECTS<sup>44</sup> and ECVET<sup>45</sup>) support learners in shaping their own learning pathway through accumulation of credits – whether within a certain institution, from institution to institution, from country to country, or between different contexts of learning (i.e. formal, non-formal and informal learning). Common European *quality assurance arrangements* (ESG<sup>46</sup>, EQAR<sup>47</sup> and EQAVET<sup>48</sup>) contribute to improving mutual trust in education and qualifications systems, thus facilitating recognition across borders. The Europass framework, including the Europass CV and the European Skills Passport<sup>49</sup>, provides important documentation tools for citizens to describe their acquired knowledge, skills, competences and qualifications in a more transparent and structured way.

Important progress in the implementation and use of the above mentioned policies and tools can be identified. However, the analysis below also depicts certain remaining challenges and lends support to closer coherence and coordination between the different tools and services, as called for in the "Rethinking Education" Communication, which announced the creation of a *European Area for Skills and Qualifications*. The European Area for Skills and Qualifications is to support the drive to achieve transparency and recognition of skills and qualifications within and across national borders, in all sub-systems of education and training as well as on the labour market.

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<sup>41</sup> See also the report JRC-IPTS (2013) *DIGCOMP: A Framework for Developing and Understanding Digital Competence in Europe* (<http://ftp.jrc.es/EURdoc/JRC83167.pdf>).

<sup>42</sup> European Qualifications Framework for lifelong learning, launched by the Recommendation of the European Parliament and the Council of 23 April 2008.

<sup>43</sup> Qualifications Framework for the European Higher Education Area agreed by ministers responsible for higher education within the Bologna Process in 2005.

<sup>44</sup> European Credit Transfer and Accumulation System - the credit system for higher education used in the European Higher Education Area, involving all countries engaged in the Bologna Process.

<sup>45</sup> European Credit System for Vocational Education and Training adopted by the Recommendation of the European Parliament and the Council of 19 June 2009.

<sup>46</sup> European Standards and Guidelines for Quality Assurance in Higher Education developed by ENQA (European Quality Assurance Network in higher education) and endorsed by ministers of higher education in the Bologna Process in 2009.

<sup>47</sup> European Quality Assurance Register for Higher Education – which was established in March 2008.

<sup>48</sup> European Quality Assurance for Vocational Education and Training adopted by the Recommendation of the European Parliament and Council of 18 June 2009.

<sup>49</sup> Decision no 2241/2004/EC of the European Parliament and of the Council of 15 December 2004 on a single community framework for the transparency of qualifications and competences (Europass).

Among 36 countries<sup>50</sup> that participate in the EQF, 20 countries have already adapted their national qualification levels to the EQF and 7 countries are planning to follow them by the end of 2013. By the end of 2014, it is foreseen that 32 countries will have referenced to the EQF, including all Member States. Half of the 20 countries that have already referenced the EQF have also self-certified to the QF EHEA in a single process relating their qualifications levels to both the EQF and the QF EHEA<sup>51</sup>.

There are important subsequent steps required to make the qualifications frameworks function in practice. So far, 7 countries have started to indicate EQF levels in their new certificates, diplomas and Europass documents issued, and in national qualifications databases.

Table 2.3. Status of the implementation of the European Qualifications Framework

National Qualification Frameworks referenced to the EQF?	Countries
Completed	20 countries: AT, BE-fl, BG, CZ, DE, DK, EE, FR, HR, IE, IT, LT, LU, LV, MT, NL, PL, PT, SI, UK
To be completed by end 2013	7 countries: BE-fr, CY, EL, ES, FI, RO + IS, NO
To be completed in 2014	5 countries: HU, SE, SK + MK, TK
Implementation of EQF in documents and national qualifications databases	Countries
EQF level in new certificates, diplomas	3 countries: CZ, DK, LT
EQF level in Europass supplements (Certificate Supplements and Diploma Supplements)	5 countries: CZ (cs), DK (ds), EE (ds), FR (cs), IE (ds)
EQF level in national qualifications databases	4 countries: CZ, DK, FR, UK

Complementing the EQF recommendation, the Council Recommendation on the validation of non-formal and informal learning<sup>52</sup> invites Member States to develop new arrangements by 2018 and to allow citizens to obtain qualifications on the basis of validated learning outcomes. The Member States with the most advanced arrangements include FR, PT, NL, FI and LU. Several other countries are also making significant progress, but some are still at a starting point and there is often still a lack of transparency around the rules and procedures of recognition of skills and qualifications. The state-of-play of validation practices in Europe will continue to be mapped through regular reviews and updates of the European Inventory on the validation of non-formal and informal learning<sup>53</sup>, in cooperation with the Member States.

The extensive use of the tools in the Europass framework is instrumental in providing citizens with relevant and recognised documentation tools. The Europass portal has been visited by almost 60 million people since its launch in February 2005 and the Europass CV is the most iconic document: it has been used by more than 24 million people since its launch in 2005. However, it remains a challenge that Europass is not sufficiently well-known by employers. Part of the Europass framework, the European Skills Passport was implemented in 2012. As of early July 2013, more than 800 000 passports have been created by citizens.

The implementation of the European credit transfer systems in higher education (ECTS) and VET (ECVET) are at different stages. The 2012 Bologna Process Implementation Report concludes that “a look at the implementation of ECTS as a transfer and accumulation system shows that it is almost completed. Yet, linking credits with learning outcomes is not completed [...]”. The report found that there were nine systems – amongst them AT, BE fr, BE nl, CZ, DE and PT – where all parts of programmes are linked with learning outcomes in less than 50 % of programmes, and three countries – amongst them HU and SK – where no links were made to learning outcomes<sup>54</sup>.

*ECTS is not yet fully in line with the learning outcomes approach*

As regards ECVET, the preparatory phase of implementation has started in all European countries (ECVET coordination points are being set up, and detailed roadmaps for ECVET implementation are emerging)<sup>55</sup>. The ECVET Recommendation invites the Commission to evaluate the implementation

<sup>50</sup> 28 Member States, 5 candidate countries, CH, LI and NO.

<sup>51</sup> See also pp. 45-46 of the 2012 Bologna Process Implementation Report at: [http://www.ehea.info/Uploads/\(1\)/Bologna%20Process%20Implementation%20Report.pdf](http://www.ehea.info/Uploads/(1)/Bologna%20Process%20Implementation%20Report.pdf).

<sup>52</sup> OJ 2012/C 398/01.

<sup>53</sup> <http://www.cedefop.europa.eu/en/about-edefop/projects/validation-of-non-formal-and-informal-learning/european-inventory.aspx>.

<sup>54</sup> See also Figure 2.16 and 2.17 on p. 48 of the same report.

<sup>55</sup> Cedefop (2012), *The development of ECVET in Europe* (see: [http://www.cedefop.europa.eu/EN/Files/6114\\_en.pdf](http://www.cedefop.europa.eu/EN/Files/6114_en.pdf)).

of ECVET five years after its launch. The Commission will launch the evaluation on ECVET in mid-2013 and report in 2014. The parallel implementation of the two credit systems does however leave room for improved consolidation and coherence in order to strengthen permeability across sub-systems.

The importance of a holistic vision also applies to the European quality assurance instruments (ESG, EQAR and EQAVET). External evaluations of EQAVET and quality assurance arrangements in higher education are on-going. For these instruments to fulfil their purpose of contributing to mutual trust in education and qualification systems, the principles they enshrine should be applied evenly and understood in the same way across education systems, while also respecting the autonomy of national governments in this area.

The exchange of information and debate between the world of education and training and the world of the labour market is still occasional and under-developed in many countries. To facilitate such exchange it is important to have a common language (on knowledge, skills and competences) and easily accessible and up-to-date information on skills supply and skills needs for the near and medium-term future. The various instruments above, and in particular the qualifications frameworks and the learning outcomes approach, have indeed promoted communication on skills need and skills supply in the labour market. However, further action is taken to address this challenge, most notably the *European Skills Panorama*<sup>56</sup> and the *European Skills, Competences, Qualifications and Occupations taxonomy (ESCO)*<sup>57</sup>.

The European Skills Panorama was launched in December 2012 and gathers comprehensive intelligence on skills supply and skills needs in various sectors and occupations of the labour market. It is used by a wide range of actors including bodies responsible for education and employment policies, job and career guidance centres and education and training institutions. Since the launch the European Skills Panorama website has had on average around 600 daily visitors.

ESCO aims to describe the most relevant skills, competences and qualifications needed for several thousand occupations and provide a common language bridging education and the labour market. ESCO has the potential to bring benefits to both jobseekers, employers and education and training institutions, for example by allowing a more precise description of skills sets held by individuals or required by employers or a better adaptation of training initiatives and career guidance services to the needs of the labour market. A first version of ESCO will become available in October 2013. A full ESCO covering all economic sectors is planned to be completed in 25 languages in 2017.

#### *Policy lessons*

- With public debt in the EU expected to reach 90.6% of GDP in 2014 and economic growth to remain moderate (1.4%), all Member States are confronted with the double challenge of consolidation public finance while investing in growth-enhancing policies. Education and training, on average, is granted 5.3% of GDP (2011). As the crisis persists, many Member States consider reducing education expenditure as an option to reduce budget deficits, running the risk of compromising sustained growth in the years to come.
- Sixteen Member States decreased their education expenditure at some stage between 2008 and 2011, with six of them showing further significant budget decreases in 2012 (EL, IT, CY, LV, PT, UK-WLS). Cutbacks in spending per student across Europe started to be most prevalent in tertiary education (12 Member States) between 2008 and 2010. Whereas the majority of Member States decreased spending per student for at least one level of education, BG, ES, HR, IT, LV and RO cut down on all levels from primary to tertiary in this period.
- Europe is lagging behind in the development of Open Educational Resources (OER) and Massive Open Online Courses (MOOCs). Although digital technologies are fully embedded in the way people interact, work and trade, they are not being fully exploited in European education and training systems. While 70% of teachers in the EU recognise the importance of training in ICT-supported pedagogies, only 20% of students are taught by digitally confident and supportive teachers.

<sup>56</sup> See <http://euskills panorama.ec.europa.eu/>.

<sup>57</sup> See <http://ec.europa.eu/social/main.jsp?langId=en&catId=89&newsId=852>.

*Policy lessons (continued)*

- Despite the existence of a large number of tools for the transparency and recognition of skills and qualifications there still exist obstacles for individuals to move between countries, across different education sub-systems and from education to work. In a fully developed European Area for Skills and Qualifications anybody should be able to move freely and have their competences and qualifications quickly recognised for further learning and adequately understood and assessed by employers, supported through European transparency and recognition tools for skills and qualifications.