



ISSN 2443-8022 (online)

Investing in People's Competences: A Cornerstone for Growth & Wellbeing in the EU

Anna Thum-Thyssen, Rossella Cravetto
and Jan Varchola

DISCUSSION PAPER 139 | MARCH 2021

EUROPEAN ECONOMY



Economic and
Financial Affairs

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Luxembourg: Publications Office of the European Union, 2021

PDF ISBN 978-92-76-23768-6 ISSN 2443-8022 doi:10.2765/815825 KC-BD-20-007-EN-N

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Investing in People's Competences

A Cornerstone for Growth and Wellbeing in the EU

Anna Thum-Thysen, Rossella Cravetto and Jan Varchola

Abstract

This paper was initially prepared as a technical background note for the first joint ECOFIN and EYCS (education) Council formation meeting on 8 November 2019. Ministers exchanged views on the role of education and training in contributing to long-term sustainable growth and shared best practices on policies promoting efficiency and effectiveness of investment in education and training. The main messages were reported by the Finnish presidency to the President of the European Council on December 11th 2019. Investing in people's competences is one of the best investments a society can make. It enhances economic growth and well-being, especially against the backdrop of current developments such as digitalisation and climate change.

The COVID-19 pandemic has had a major impact on education and training systems in Europe, which had to adapt quickly to new and challenging realities, ways of learning, teaching and communicating in order to compensate for learning losses linked to the lockdown. In particular, the pandemic has further exacerbated inequalities in access to high quality education and training, making quality investment and policy action ever more pertinent. High quality public investment in education and training – that is efficient and effective regarding the quantity, quality and inclusiveness of outcomes – is key. Action in four main policy areas can enhance people's competences efficiently and effectively: (i) ensuring quality and equal opportunities in education and training; (ii) fostering competences for the future; (iii) exploring ways of financing education and training – also through synergies with EU funds; and (iv) fostering synergies with complementary structural policies.

JEL Classification: I2 (I21, I26, I28), H52), O15.

Keywords: education, skills, quality of public finance, investment.

Acknowledgements: We would like to sincerely thank Thorsten Hubertus Arndt, Trine Jakobsen, Mary Veronica Tovšak-Pleterski, Geraldine Mahieu, Stefaan Hermans, Manuela Geleng, Alexandr Hobza, Erik Canton, Anne van Bruggen, Susanne Conze, Dana Bachmann, Marco Montanari, Veronica De Nisi, Mantas Sekmokas, Kinga Szebeni, Gelu Calacean, Julie Fionda, Michael Horgan, Anita Halasz, Resa Koleva-Demonty, Karl Pichelmann, Maria Chiara Morandini, Anneleen Vandeplass, Peter Voigt, Wouter Simons, Christoph Maier, Philipp Pfeiffer, Filippo Munisteri, Georgia Efremova, Pasquale d'Apice, Angel Catalina Rubianes, Savina Princen, Athena Kalyva, Ingrid Toming, Edouard Turkisch and the Finnish Presidency, in particular Johanna Koponen and Samuli Pietilainen as well as the members of the European Union's Economic Policy Committee, the Education Committee and the Employment Committee.

Contact: Anna Thum-Thysen, Directorate-General for Economic and Financial Affairs, anna.thum@ec.europa.eu; Rossella Cravetto, Directorate-General for Education, Youth, Sport and Culture, rossella.cravetto@ec.europa.eu; Jan Varchola, Directorate-General for Employment, Social Affairs and Inclusion, jan.varchola@ec.europa.eu. European Commission.

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EXECUTIVE SUMMARY

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Investing in people’s education and training brings substantial benefits to the economy and society. Providing accessible and high quality education and training is the basis for sustainable growth, innovation, competitiveness and both individual and macro-economic resilience. It promotes equal opportunities and by fostering personal development and high employability, it helps preventing poverty, social exclusion and boost social mobility. In addition, high quality education and training is part of the foundation for active citizenship in a modern, open democracy. Education and training are key drivers for social fairness, the sense of belonging together and being part of a cultural community.

Fostering high quality education and training is key for economies and people to seize the opportunities that the current economic and societal transformations offer. High quality education and training provide the competitive edge to the EU in a global, increasingly digital and knowledge-based economy. For the future, Europe will depend even more on creative, highly skilled and well-trained people. Investing in education and training will help the EU face big challenges such as climate change, globalisation, rising inequalities, migration, technological change and demographic change and help transition towards a more sustainable and inclusive society.

The current COVID-19 pandemic has disrupted standard education and training activities and may result in important learning losses.. Despite the fact that Member States have quickly moved towards digital learning solutions, the containment measures and ensuing crisis have put the resilience of the system to the test. The situation in vocational education and training was further aggravated by the fact that practical training – in form of work-based learning and apprenticeships – has been suspended in most sectors.² Moreover, students whose families were less able to provide the needed support for an effective distance learning will probably experience larger learning losses than their more advantaged peers and possibly further social and economic inequalities later on (OECD 2020).

Investment in high quality education and training can help unlock the still large pool of unused talent in Europe. One in ten young people in the EU leaves education or training with a low qualification (“early school leavers”). This significantly diminishes their employment prospects and comes with substantial societal costs. In the EU, a scenario of reducing the overall share of low-qualified people by half by 2025 is estimated to realise an annual economic net benefit of around EUR 200 billion (see Cedefop 2017). The European Semester analysis also points to significant investment needs in this respect.

High quality education and training accessible *for all* is one of the best investments a society can make but it does not come for free. Achieving good educational outcomes requires appropriate spending: for some Member States, the immediate challenge is to provide adequate spending to ensure higher quality and/or more equitable outcomes, while for others it is spending more efficiently to

²https://www.cedefop.europa.eu/files/cedefop_community_apprenticeship_experts_synthesis_how_are_european_countries_managing_apprenticeships_to_respond_to_the_coronavirus_crisis.pdf

improve their education outcomes - or both. Governments in the EU spend more than EUR 700 billion or around 5% of the EU's GDP each year on education and training. Spending this money *effectively* to reach high-quality educational outcomes and inclusive education and training ("*doing the right thing*") is in the shared interest of policy-makers, both in the education and training area and in public finance. Moreover, policy-makers have to use the available public money in the best possible way. In other words, it is key to make *efficient* use of the limited resources available ("*doing things right*").

The gains from using public investment in education and training more efficiently can be substantial. A simple demonstrative exercise by Voigt et al (2020) shows that there could indeed be remarkable gains to be reaped if Member States succeeded in increasing the efficiency of their spending on education and training. Using the current expenditures on schooling in the most efficient way in terms of achieving high outcomes in the PISA international student assessment survey would, for instance in 2015, lead to considerable improvements in annual growth of GDP per capita of between 0.4 (as in Estonia) and 1.6 percentage points (as in Cyprus)³. It should however be noted that these estimates are subject to several simplifying hypotheses, including that all existing inefficiencies in terms of spending on education could be fully and instantly eliminated. This is clearly unrealistic and the empirical estimates should thus be used in a prudent way. They nevertheless demonstrate the importance of efforts to increase the efficiency of spending on education.

Investing in people's competences needs to cover all stages of life. Building the foundation for high-quality educational outcomes early in life is key to ensure that all people acquire the necessary key competences (Council of the European Union 2018).⁴ This includes investing in high quality and accessible early childhood education and care systems. At the same time, the transition from education and training to work and then from one job to another is crucial and requires continuous upskilling and reskilling of the adult population. Therefore, comprehensive investment strategies in education and training, which cover all stages of life, bring the highest private and social returns.

Action in four main policy areas can enhance people's competences efficiently and effectively: (i) ensuring quality and equal opportunities in education and training; (ii) fostering competences for the future; (iii) exploring ways of financing education and training, also through synergies with EU funds; and (iv) fostering synergies with complementary structural policies.

Policy efforts should strive to achieve quality and equal opportunities in education and training at the same time. Experiences show that these twin objectives can be fully compatible. Well-designed lifelong learning strategies are an effective and efficient tool to raise quality and inclusion of education and training systems. In this context, high-quality and accessible early childhood education and care is an essential foundation for successful lifelong learning, personal development and later employability, especially for disadvantaged families. It can enhance social mobility by helping children from disadvantaged backgrounds acquire the key competences they need for tomorrow's economy and society. Attracting and retaining high-quality teachers, providing appropriate infrastructure, including student housing, ensuring autonomy and accountability of education and training institutions, and promoting socio-economic diversity of pupils within schools are essential ingredients to facilitate achieving excellence and promoting equity.

³ For details, see Technical Annex.

⁴ The Council Recommendation on key competences for lifelong learning defines eight key competences: Literacy; Multilingual; Mathematical and science, technology and engineering; digital; Personal, social and learning to learn; Citizenship; Entrepreneurship; Cultural awareness and expression.

Competences for the digital economy include not only digital skills but also a broader set of transversal competences. The transition towards the digital economy will progressively change the needed competences. Digital skills are key for productivity and economic growth but this is only half of the story. A wider set of other competences can help to face the challenges, and reap the benefits of digitalisation. Combining digital skills with media literacy, socio-behavioural and other transversal competences seems to be a promising strategy. This includes basic skills, languages as well as personal and social skills, such as critical thinking, learning to learn, team-work, resilience, communication and being creative. Being able to work with different cultures and disciplines is also important. The COVID-19 crisis offers an opportunity to accelerate reforms in education and training systems and strengthen their resilience, including by digitising learning offers and methods. This requires paying attention to the need to ensure access to digital tools and technologies for every learner, teacher and trainer, as well as appropriate guidance measures. For example, in vocational education and training, digital tools such as simulators, virtual and augmented reality have the potential to increase accessibility and efficiency of training.

Ensuring appropriate investment in education and training may call for a smart mix of public and private financing. Public funding is the key source of spending on education in Europe, in particular at the primary and secondary level. At the tertiary stage, co-financing is also used and in terms of training, private financing is the main source. The private sector is covering part of the investment burden into adult upskilling and reskilling. For example, in 2015 private sector companies with at least 10 employees (representing around 50% of all jobs) have invested EUR 60.6 billion in training their employees. By some earlier estimates, EU Member States invest between 0.1% to 0.5% of GDP into adult re-training and upskilling. Smart financing frameworks can stimulate or incentivise the private sector to invest more in skills development. For upskilling and reskilling of adults, tax or financial incentives or public-private partnerships are used in several EU Member States. EU funds play an important complementing role, which should be further strengthened in the new Multiannual Financial Framework.

Complementary structural policies can make investments in education and training more powerful in achieving their objectives. A favourable economic policy context should render expenditure on education and training more efficient and effective without leaving anyone behind. Policies could boost both the supply and demand for skills, take into account complementarities between types of human and non-human capital and social policies could act as a buffer during transition periods. To strengthen the link between educational attainment and productivity, policy could support business environment conducive to the creation of skilled jobs, foster synergies with other areas of investment and welfare policies can provide income security during transitions. EU-level policy coordination across different policy areas, for instance through the European Semester, could be useful in this regard and further strengthened. The European Semester provides a framework for coordinating economic policies including on product markets, labour markets and fiscal policy to ensure sound public finances, to prevent excessive macroeconomic imbalances, to create more jobs and growth and to boost investment. Also the Recovery and Resilience Facility, the key recovery instrument at the heart of NextGenerationEU, will help the EU emerge stronger and more resilient from the current crisis by supporting growth-enhancing investment and speed up the implementation of structural reforms, in particular the flagship project “reskill and upskill - the adaptation of education systems to support digital skills and educational and vocational training for all ages”.⁵

⁵ https://ec.europa.eu/commission/presscorner/detail/en/IP_20_1658.

1. INTRODUCTION

Investing in people's key competences responds to many of the changes that Europe is facing today. Globalisation, technological progress, environmental sustainability concerns, political challenges - including growing inequality and demographic change - are having a profound impact on the European economies and societies. Globalisation and global value chains have implications on skills specialisation. Structural changes induced by rapid technological development trigger changes in skills demand and the pace of change is increasing. New business models, such as those based on the "sharing economy", are impacting upon the traditional forms of work organisation, employer-employee relations and opportunities for skills development. Mitigation of the effects of climate change requires appropriate technological developments and policy responses, including addressing specific skills needs. Growing inequality can be addressed by improving inclusiveness and quality of education and training, thereby reducing barriers to social mobility. Population ageing and migration will have an impact on the supply of skilled labour, its diversity and the intensity of skills shortages. More recently, the COVID-19 pandemic has exposed millions of Europeans to new ways of learning, teaching and communicating, putting education and training systems under unprecedented pressure and calling for quick adaptation of learning processes to ensure skills provisioning. Overall, education and training are of strategic importance for the future of Europe as they can help boost economic resilience through a better skilled labour force and reinforce social cohesion and active citizenship, which are the basis of wellbeing and democracy.

Investment in high quality education and training can help unlock the still large pool of unused talent in Europe. In 2018, over 10% of young people aged 18-24 in the EU had left education or training with a low qualification ("early school leavers") and almost 27% of young adults had not attained either a vocational education or training, or higher education qualification. This group of young people with low-qualifications or holding a general upper secondary degree have lower employment chances: only 57% of 20-34 year-olds with at most lower secondary education and not participating in education or training were employed. Moreover, only 66% of recent graduates holding a general upper secondary degree were employed, compared to 80% for recent graduates from vocational education and training and 86% for recent tertiary graduates⁶. Moreover, one in five young Europeans still lack adequate reading, maths or science skills and almost every second EU person has an insufficient level of digital skills⁷. Policies can most effectively address these problems by focusing on supporting students facing socio-economic disadvantage and such policies hence foster equal opportunities and social mobility.

The importance of people's competences for EU economies calls for coordinated action by Member States. The importance of education and training is clearly recognised in EU legislation and beyond. The *European Pillar of Social Rights*⁸ indicates that everyone has the right to quality and inclusive education, training and life-long learning. According to the *Treaty of the Functioning of the European Union*, the Member States and the Union work towards a coordinated strategy for employment and particularly for promoting a skilled, trained and adaptable workforce and responsive

⁶ Eurostat, Labour Force Survey database.

⁷ The Digital Economy and Society Index, European Commission, <https://ec.europa.eu/digital-single-market/en/desi>.

⁸ European Pillar of Social Rights, endorsed by the EU leaders in November 2017.

labour markets with a view at achieving economic growth, supporting full employment as well as economic, social and territorial cohesion.⁹ Moreover, the EU contributes to the development of quality education and training by encouraging cooperation between Member States¹⁰ and defining a supporting role for the Union in the field of education and training.¹¹ The European Council has recently adopted the *2019-2024 Strategic Agenda for the Union*¹², calls for stepping up investments in people's skills and education, do more to foster entrepreneurship and innovation and increase research efforts, in particular by addressing the fragmentation of European research, development and innovation. Moreover, various EU initiatives support investment in people's competences (Box 1).

EU Member States have a shared interest in investing smartly to increase the quality of educational outcomes and reduce inequalities. High-quality inclusive education and training systems require appropriate funding. Below a certain level of spending, more spending is associated with better outcomes (e.g. the OECD 2016a puts this level at some 50 000 purchasing power adjusted USD cumulative spending per student aged 6 to 15). At the same time, at a comparable level of spending, some Member States achieve better results than others. This means there is no guarantee that increasing public spending yields automatically better results. This evidence points to the critical importance of increasing efficiency and ensuring effectiveness without leaving anyone behind (European Commission 2018a).

This note discusses the importance of education and training in addressing common economic and societal challenges in the EU. It provides policy considerations on investing in future-oriented education and training systems. This question and the results from our corresponding calculations were also discussed at the first joint ECOFIN and EYCS (education) Council formation meeting on November 8th 2019. Ministers exchanged views on the role of education and training in contributing to long-term sustainable growth and shared best practices on policies promoting efficiency and effectiveness of investment in education and training. The main messages were reported by the Finnish presidency to the President of the European Council on December 11th 2019, highlighting the strategic importance of investment in education and that there is need for stronger EU cooperation in this regard.

⁹ Art. 145 TFEU.

¹⁰ Art 165-166 of the Treaty of the Functioning of the European Union (TFEU).

¹¹ Art 165-166 of the Treaty of the Functioning of the European Union (TFEU).

¹² <https://www.consilium.europa.eu/media/39914/a-new-strategic-agenda-2019-2024.pdf>.

Box 1: Selected EU initiatives supporting investment in people's competences

- The *European Pillar of Social Rights* (2017) provides an EU framework for fostering equality and stresses the importance of education and lifelong learning in its first principle: "everyone has the right to quality and inclusive education, training and life-long learning in order to maintain and acquire skills that enable them to participate fully in society and manage successfully transitions in the labour market". In its second principle it addresses gender equality: "Equality of treatment and opportunities between women and men must be ensured and fostered in all areas, including regarding participation in the labour market, terms and conditions of employment and career progression. Women and men have the right to equal pay for work of equal value."
- The European Skills Agenda for sustainable competitiveness, social fairness and resilience (2020) sets ambitious, quantitative objectives for upskilling (improving existing skills) and reskilling (training in new skills) to be achieved within the next 5 years. Its twelve actions focus on skills for jobs by partnering up with Member States, companies and social partners. The vision behind the Agenda is to work together for change, by empowering people to embark on lifelong learning, and by using the EU budget as a catalyst to unlock public and private investment in people's skills. The aim is to ensure that the right to training and lifelong learning, enshrined in the European Pillar of Social rights, becomes a reality all across Europe, from cities to remote and rural areas, to the benefit of everyone. The Commission is placing skills at the heart of the EU policy agenda, steering investment in people and their skills for a sustainable recovery after the coronavirus pandemic. Businesses need workers with the skills required to master the green and digital transitions, and people need to be able to get the right education and training to thrive in life.
- As part of the 2020 European Skills Agenda, the Commission adopted a proposal for a Council Recommendation on vocational education and training for sustainable competitiveness, social fairness and resilience. It aims to a) modernise vocational education and training in the EU, adapting it to a more digital and greener economy; b) ensure that vocational education and training is agile, adapting swiftly to labour market needs and providing quality opportunities for young and adults alike; c) reinforce opportunities for work-based learning and apprenticeships; d) increase the flexibility of vocational education and training, including by encouraging modular and non-formal learning methods; and e) boost the quality assurance of vocational education and training and promote Centres of Vocational Excellence. It also includes quantitative objectives to be achieved by 2025 for employment rate of vocational graduates (82%), exposure of vocational learners to work-based learning (60%) and mobility of vocational learners (8%).
- The *European Education Area* (2020) aims at enriching the quality, inclusiveness and digital and green dimensions of Member States' education systems. Its main initiatives look at ways to enhance quality, notably with regard to basic and digital skills, make school education more inclusive and gender sensitive, strengthen understanding of climate change and sustainability, support the teaching profession, further roll out European Universities and enhance connectivity among education and training institutions. It also proposes a framework for cooperation with Member States and engagement with education stakeholders, including a reporting and analysis structure, with agreed education targets, to encourage and track reforms.
- The *Digital Education Action Plan* (2020) proposes a set of initiatives for high-quality, inclusive and accessible digital education in Europe, and calls for stronger cooperation between Member States at European level, as well as with and between stakeholders, to make education and training systems truly fit for the digital age. The Action Plan has two long-term strategic priorities: (i) fostering the development of a high-performing digital education ecosystem and (ii) enhancing digital competences for the digital transformation. In order to strengthen the cooperation and exchange in digital education at EU level, the Commission aims at creating a European Digital Education Hub to foster collaboration and synergies between policy areas relevant to digital education, create a network of national advisory services and strengthen the dialogue between stakeholders from the public and private sector.

2. EDUCATION AND TRAINING AS A RESPONSE TO COMMON ECONOMIC AND SOCIETAL CHALLENGES IN THE EU

Education and training improve economic growth, productivity and stimulate innovation (European Commission 2017). High student performance is positively related with GDP per capita (Hanushek and Woessmann 2011). If the EU succeeded in reducing the proportion of low-achievers in basic skills to less than 15%, an ambition reflected in the strategic framework for European cooperation in Education and Training, the economy could plausibly gain some EUR 5,000 billion¹³ over an 80-year time horizon (i.e. average life expectancy of a person) (Hanushek and Woessmann 2012b and 2019). At the same time, a scenario of reducing the share of low-qualified adults by half by 2025 in the EU is estimated to realise an annual economic net benefit of around EUR 200 billion (Cedefop 2017). Moreover, by equipping people with key competences, education and training improves their productivity as they learn how to perform tasks more effectively and how to use sophisticated technologies (Woessmann 2017). Investing in people also provides the ground for driving research and development (R&D) and firm-based innovation of products and processes. Higher innovation intensity and its diffusion across firms increases the productivity of capital and labour inputs, which also results in higher GDP growth. In addition, ensuring that people have key competences can also prevent (future) labour market mismatches, which could be a drag on productivity (European Commission 2014 and Vandeplass and Thum-Thysen 2018).

Education and training create major social benefits, including by tackling unemployment, poverty and inequality. They can strengthen people's employability, which not only affects the labour market and society as a whole but also positively influences the lives of individuals (European Commission 2014). As the labour market is becoming more skills-oriented and knowledge-intensive, spending on quality and accessible education and training is vital as lower-educated people are at greater risk of unemployment (European Commission 2018b). Employability can translate into higher earnings and reduce the risk of future unemployment, which again is the best safeguard against personal hardship and poverty. Moreover, access for children and young people from low-income groups to good quality education and training helps break the negative link between high income inequality and earnings mobility (OECD 2017a). The benefits of learning are also realised outside formal education and training: participation in non-formal learning is associated with up to 30% higher wages and exposure to informal learning is associated with up to 10% higher wages (OECD 2019a). Furthermore, emphasis on education and training may avoid costs of unemployment, inactivity or health issues, which tend to be lower for higher educated citizens (Cedefop 2017).

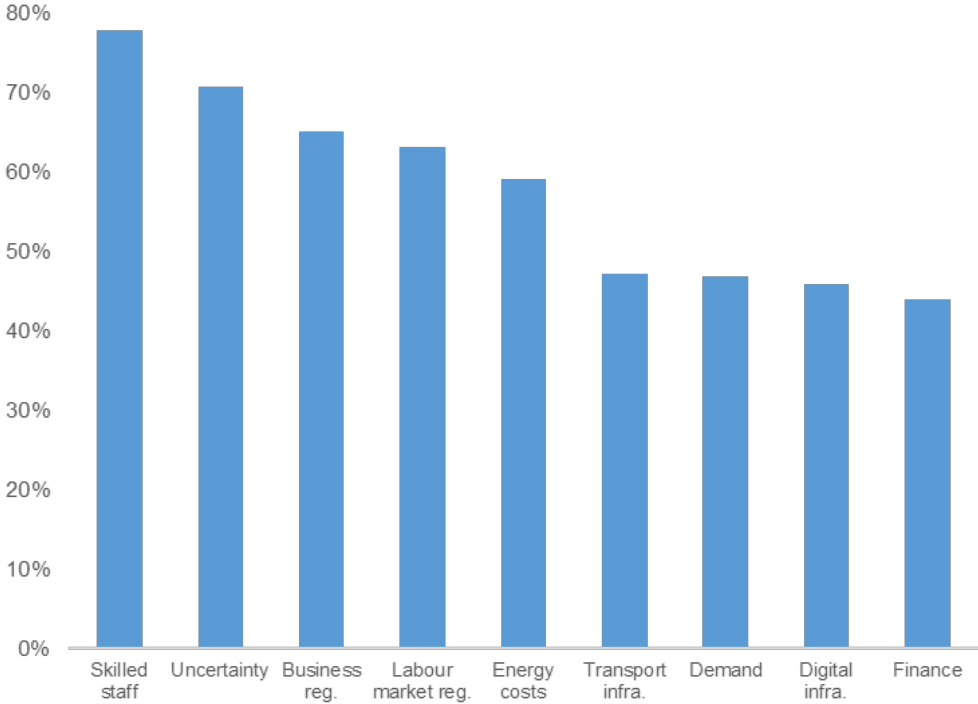
Key competences are crucial to adapt to technological change. In the US and other OECD countries, digital technologies are mostly skill-biased, leading to rising relative demand for skilled workers (OECD 2019b, Autor 2015, Deming (2017)). If the rising demand for skilled workers is not accompanied by a rapid expansion in the skills supply, the wage premium of skilled relative to less skilled workers, and therefore also income inequality, increases. Model simulations suggest that providing access to a functional education and training system is a more effective tool against rising inequality than other policy alternatives such as taxing machines ("robot taxes") (Pfeiffer 2019).

¹³ The EUR 5,000 billion refer to the present value of future increases in GDP of EU 28 countries until 2100, expressed in purchasing power parity.

Similarly, the World Economic Forum estimates that machines and/or algorithms currently perform 29% of tasks but within five years they will perform around 42% (World Economic Forum 2018). Against this backdrop, it is clear that people’s competences are likely to be where key value added lies.

Higher and more relevant competences foster competitiveness in a globalised world. The lack of adequate competences is a key obstacle to firms’ investment (Graph 1) and to technology diffusion, dampening economic growth. Firms are typically ready to invest more in physical capital if they observe increasing qualification and skills levels of the workforce (Acemoglu 1996).

Graph 1: Long-term barriers to investment, Share of firms (%) that named it as an obstacle to their investment activities

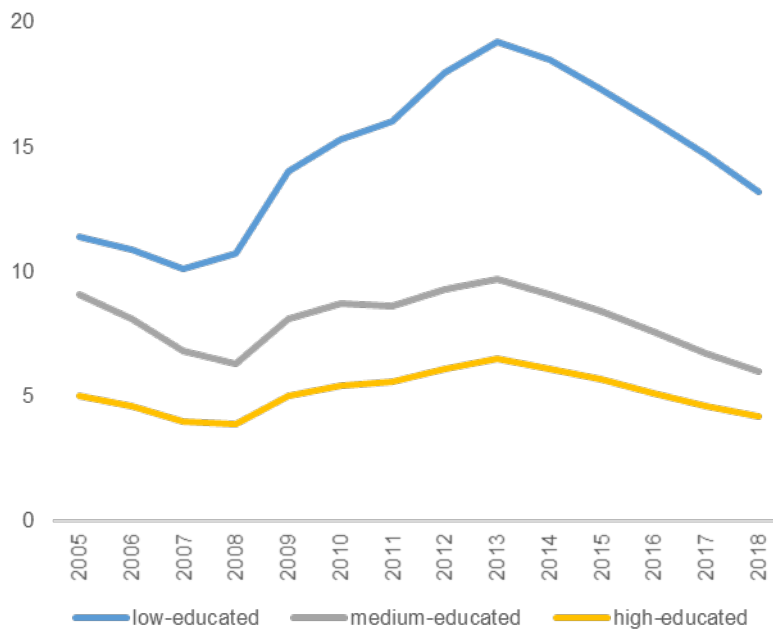


Note: 80% of firms name lack of skilled staff as a major or minor obstacle. 47% of firms name lack of skilled staff as a minor obstacle.

Source: EIB Investment Survey 2017.

Upskilling and reskilling improve resilience to economic shocks. The low-qualified labour force has been systematically more exposed to the risk of unemployment, which has become even more apparent during the crisis period. The unemployment rate among the low-educated sharply increased during the crisis and has stayed at elevated levels thereafter, whereas the unemployment rate among the medium- and high-educated labour force more or less returned to pre-crisis levels (Graph 2). Inadequate levels of skills and qualifications are a risk to future economic and social growth and sustainability (OECD 2016b). Individuals who participate in learning during adulthood, are likely to benefit economically through improved employability (European Commission 2015).

Graph 2: Evolution of unemployment in the EU, by educational attainment levels, percentage of active population, 20-64 years



Source: Eurostat

Source: Eurostat.

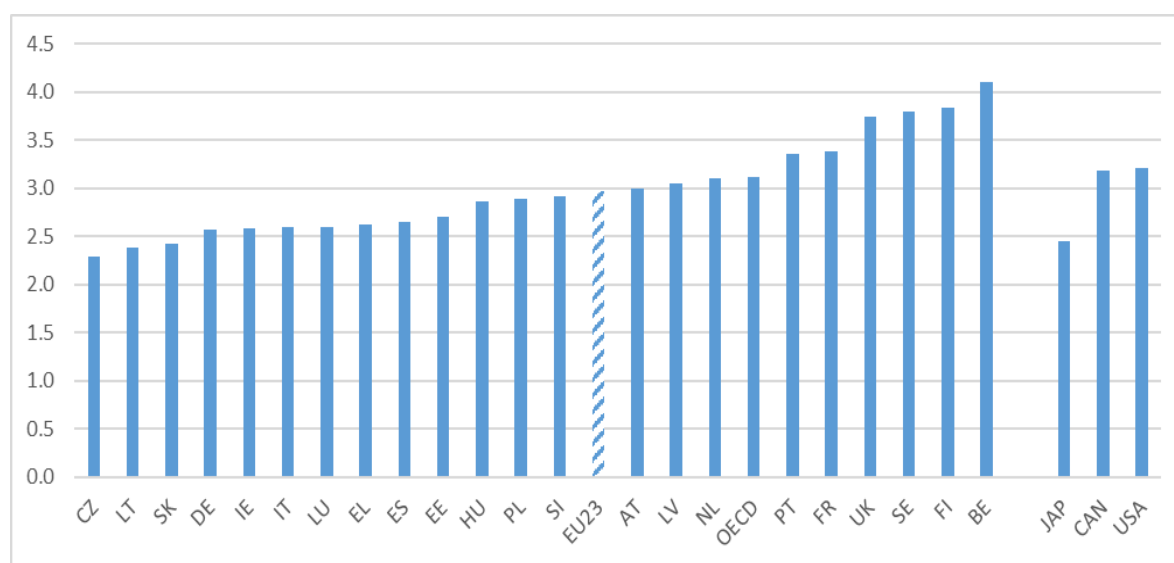
For all these reasons, investing in education and training becomes strategically important in the aftermath of the current COVID-19 crisis. This pandemic is likely to lead to important learning losses and increased inequalities, putting the role of education and training as social elevator at risk. It has also accelerated the green and digital transitions and brought new career challenges for many people in Europe. Many Europeans will need to retrain in a new skill or improve their existing skills to adapt to the changed labour market. Only improving the efficiency and effectiveness of education and training systems will allow providing appropriate answers to the challenges ahead, and turning current economic losses into future economic gains.

Finally, in order to analyse the economic effects of education and training, good quality statistical data is needed on the inputs (e.g. education expenditure), the outputs (skills; qualifications) and the outcomes (i.e. social and labour market outcomes) of such investment (European Commission 2015). However, currently the data on several of these aspects is fragmented, partial or sometimes lacking altogether (Eurostat 2016). The recording of such investment could be enhanced and connected to non-monetary education indicators in a comparable and systemic way. For that purpose, the development of a satellite account for education and training in line with UNECE (2016) recommendations could pave the way for a comprehensive future European Satellite Account for Human Capital which would eventually provide for an integrated and coherent framework to record public and private expenditure and returns to human capital and link it with non-monetary indicators.

3. INVESTING IN FUTURE-ORIENTED EDUCATION AND TRAINING SYSTEMS IN EUROPE: WHAT ARE THE POLICY CONSIDERATIONS?

Reinforcing investment in people’s competences is about spending efficiently and effectively without leaving anyone behind. This implies maximising education and training outcomes given the available resources (efficiency or “doing things right”) and achieving the mix of outcomes from education desired by society (effectiveness or “doing the right thing”) (Drucker 1967), in particular reaching high quality and inclusive education and training systems leading to economic growth, productivity and equality of opportunities. Governments in the EU spend more than EUR 700 billion or around 5% of the EU’s GDP each year on education and training (Graph 5). For some Member States, the immediate challenge is to provide adequate spending to ensure higher quality and/or more equitable outcomes, while for others it is spending more efficiently to improve their education outcomes.

Graph 3: Public expenditure on educational institutions from primary to tertiary level as a percentage of GDP, 2016



Note: Member States which are not OECD members are not shown in the graph because UOE data is unavailable; EU23 average covers the 22 EU Member states which were OECD members and Lithuania which was not an OECD member in 2015. UOE data is used here to make a comparison with non-EU Member States. Within EU comparison, General Government Expenditure by function (COFOG) data is generally used. Education and Training Monitor 2019.

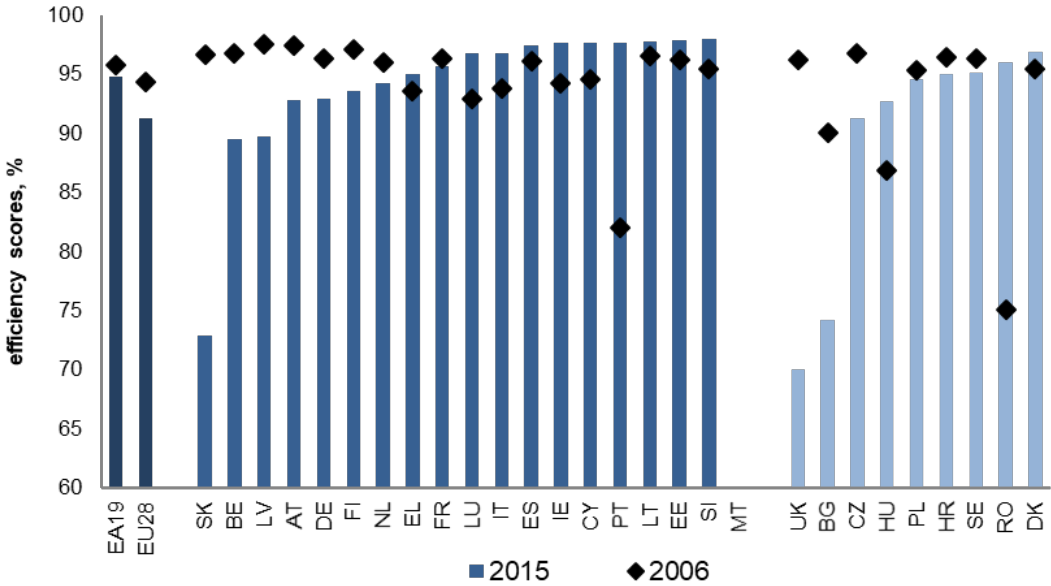
Source: OECD, Education at a Glance, 2019 on UIS/OECD/Eurostat data.

Public spending in the EU has become more efficient over time regarding a quantitative measure of educational output (tertiary degrees), but not more efficient regarding a qualitative measure of learning outcomes (PISA scores¹⁴). Calculations by the European Commission (Canton et al 2018)

¹⁴ The OECD’s Programme for International Student Assessment (PISA) is a triennial international survey, which aims to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students. Note that PISA measures basic competences used in daily life.

suggest that, over the past 20 years, the efficiency of public spending in EU Member States in achieving higher educational attainment has increased notably. These figures are driven by the fact that, overall, tertiary educational attainment figures rose dramatically while spending remained fairly stable. However, the calculations further show that significant room for efficiency improvement remains in many Member States regarding learning outcomes in the OECD’s PISA international student assessment survey compared to their own best performance over time, comparing 2015 with 2006 (Graph 6). For example, the European Commission’s calculations suggest that, while Portugal used its spending on schooling in a more efficient way in terms of achieving high PISA scores in 2015 than it did in 2006, efficiency of spending on schooling declined in the United Kingdom. Measures such as teacher training can explain improvements in efficient spending towards improving PISA scores. Below we discuss further measures that can enhance efficiency and effectiveness of spending on education and training. The calculations further suggest that some Member States have managed to be highly efficient in achieving high levels of educational attainment rates, student outcomes and inclusion, thus demonstrating that there is not necessarily a trade-off between achieving high scores in a variety of relevant aspects.

Graph 4: There is room for improving efficiency of public spending in terms of learning outcomes- evaluated in terms of PISA science scores, 2015



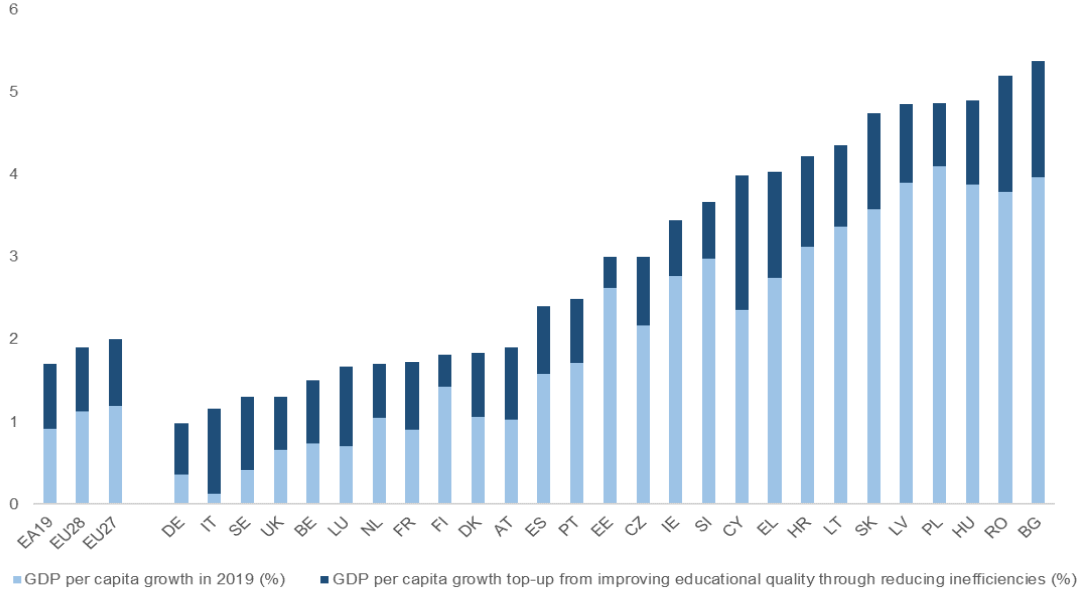
How to read the graph: Efficiency scores of countries reflect the distance to their own frontiers based on national education systems (to be read as: 'how much more of the corresponding output could be achieved in a country given the same amount of spending on education but avoiding any wastes'). The distance to 100% provides an estimate of the potential for improvement. The efficiency scores were calculated on the basis of a stochastic frontier analysis (SFA, see Technical Annex). Based on the observations in the sample, SFA implies calculating a hypothetical (non-deterministic) frontier. The graphs are constructed under the assumption that the frontier is country-specific and based on national education systems. Conceptually it is possible that no country is exactly on the frontier, i.e. all countries have leeway to improve the efficiency of their spending. Comparison between 2006 and 2015 helps to assess the evolution of a country over time. See Technical Annex for more details.

Source: European Commission based on OECD PISA data and Eurostat COFOG data. PISA science scores for 2015 are not available for Malta.

Further improving efficiency of public spending on education and training would bring considerable gains in all EU member states. A simple ‘back-of-the-envelope’ exercise documents the remarkable gains to be reaped if Member States succeeded in increasing their efficiency of

spending on education and training (see Voigt et al 2020). For instance, assuming optimal efficiency in terms of achieving high PISA scores (keeping schooling expenditure constant), would lead to considerable improvements in annual growth of GDP per capita (Graph 7). As a result of improved spending efficiency (and thus increases in terms of higher average scores in the PISA international student assessment survey), one could expect increases in GDP per capita growth between 0.4 (as in Estonia) and 1.6 percentage points (as in Cyprus). The average for both the EU28¹⁵ and the EA would be approximately 0.8 p.p. (see Graph 1 for details). The additional GDP per capita growth rate of around 0.8 p.p. would have translated into a potential increase in GDP for 2019 of up to EUR 115 billion in the EU28 and EUR 84 billion in the EA, respectively (see Voigt et al 2020). It should however be noted that these estimates are subject to several simplifying hypotheses, including that all existing inefficiencies in terms of spending on education could be fully and instantly eliminated. This is clearly unrealistic and the empirical estimates should thus be used in a prudent way. They nevertheless demonstrate the importance of efforts to increase the efficiency of spending on education.

Graph 5: Effective and efficient investment in education and training can substantially raise GDP per capita, 2019

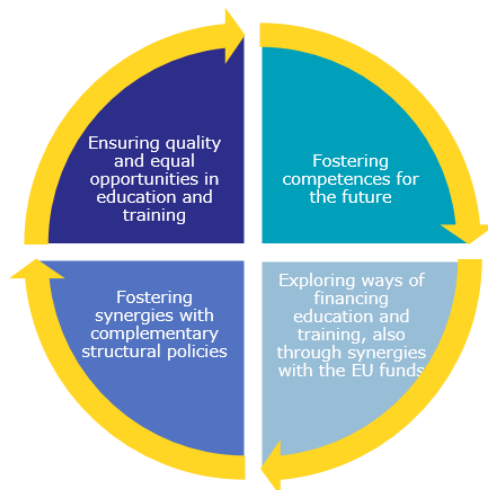


How to read the graph: Empirical analyses suggest that by removing all existing inefficiencies (compared to an EU-wide best performer) in public spending on compulsory education PISA science scores in EU member states could be increased by the amount indicated by the blue diamonds. This increase in PISA scores would imply an increase in annual real GDP per capita growth indicated by the dark grey blue part of the bars (corresponding to 0.4 to 1.6 percentage points across EU member states). This calculation is based on the empirical finding that an increase in PISA scores by one standard deviation (or 100 points) is associated with a 1.2 percentage point increase in annual GDP per capita growth over 40 years (i.e. the lower bound of possible effects estimated in Balart, Oosterveen and Webbink 2018 and Hanushek and Woessmann 2012a). An increase of around 100 points on the PISA science test score scale corresponds to the difference between the average Peruvian student and the rest of the OECD in 2015. See Technical Annex for more details. Note: Annual GDP per capita growth for 2019 is expressed in %. PISA scores are expressed in PISA points. For the analysis efficiency scores and social returns to education spending in terms of economic effects were needed. Efficiency scores were taken from Canton et al. 2018 and social returns to increasing PISA scores were taken from Balart, Oosterveen and Webbink (2018) and Hanushek and Woessmann (2012a).

Source: European Commission’s own calculations based on OECD and AMECO data. PISA science scores for 2015 available for OECD member states and several non-OECD member states. All (OECD- and non-OECD-) EU member states are covered except for Malta.

¹⁵ The cut-off date for the data in this paper was before the UK left the EU (therefore, the UK is still included in EU28 aggregate figures).

Action in four main policy areas can enhance people’s competences efficiently and effectively: (i) ensuring quality and equal opportunities in education and training; (ii) fostering competences for the future; (iii) exploring ways of financing education and training, also through synergies with EU funds; and (iv) fostering synergies with complementary structural policies.

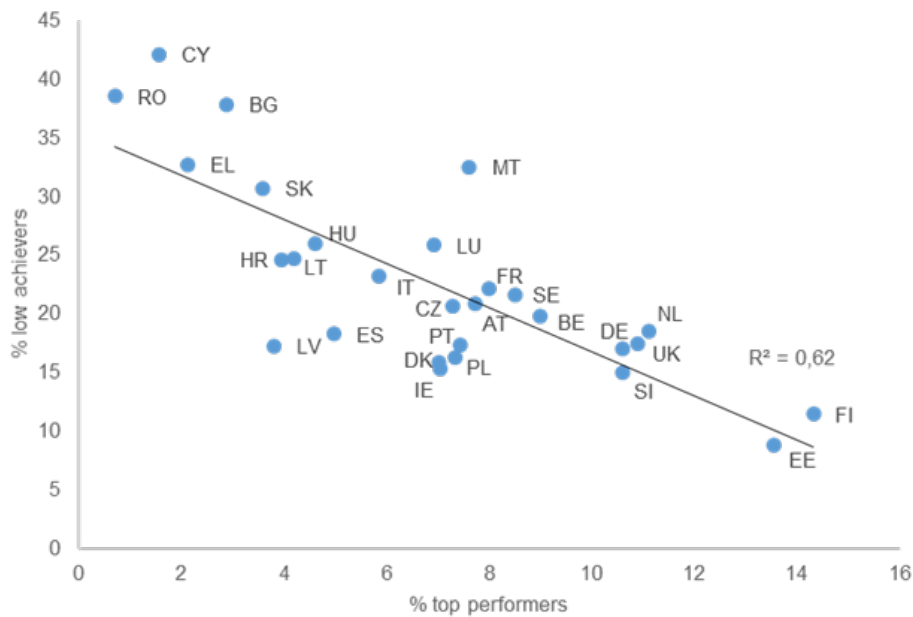


3.1. ENSURING QUALITY AND EQUAL OPPORTUNITIES IN EDUCATION AND TRAINING

To seize the opportunities of economic and societal transitions, education and training systems need to deliver excellence in an inclusive manner. Achieving excellence and equity at the same time is in itself a challenge but it can be done. Across EU countries, the proportions of top performers and low achievers in knowledge and skills in the area of science¹⁶ are negatively related indicating that education and training systems with many top performers tend to have few low achievers (Graph 8). Note that given that there are also medium-level achievers, the low- and top performers are not mirror images of each other. Specific policies ranging from early childhood education and care to higher education, vocational education and training and adult learning should be designed to enhance both equity and quality (Woessmann 2008).

¹⁶ Top performers are students who are able to creatively and autonomously apply their knowledge and skills to a wide variety of situations. Low achievers are students failing to reach the minimum level of reading skills and competences required to participate effectively in their studies, the labour market and society. These indicators capture to what extent a school system can produce excellent results (quality) and the system’s ability to ensure that as many pupils as possible reach at least a basic level of competences (equity).

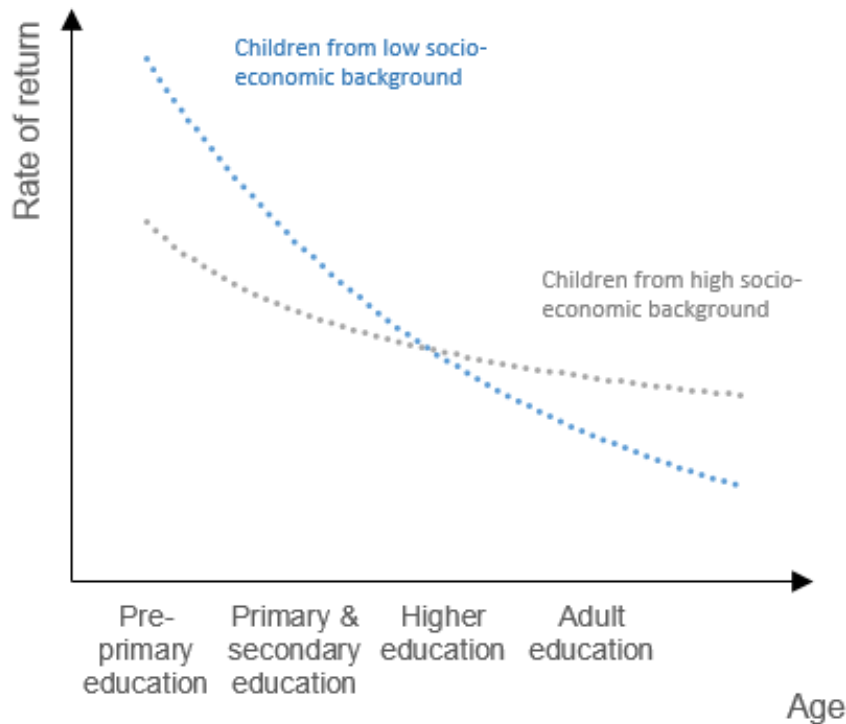
Graph 6: Education and training systems with many top performers tend to have few low performers



Source: Commission services calculations based on PISA Science score data (OECD).

Lifelong learning strategies are an essential tool to raise quality and inclusion. Early intervention to increase participation and raise achievement is the most efficient method to improve education outcomes and employment prospects but interventions easing the transition from education to work and from work to work are also crucial. High-quality early childhood education and care is a foundation for successful lifelong learning, personal development and later employability (Sylva et al 2012). *France*, for example, increased participation in early childhood education and care from 35% to 90 % in the 1960s. It can be shown that one additional year of early childhood education and care attendance is likely to raise average earnings by 3% and to lower the dropout rate by 2% (Dumas and Lefranc 2019). Children from a disadvantaged background, who are more likely to be less stimulated owing to a home environment potentially less conducive to learning, get the highest benefits from their participation in early childhood education and care. If these children fall behind at early stages, their returns to investment at later stages will suffer because they lack the key competences that enhance their possibility to acquire new skills at later stage (their skill production technology is less productive) (Graph 9) (Duckworth et al 2009). Investing in education and training systems for later stages is also part of a successful lifelong learning strategy. In countries with well-developed systems of vocational education and training – particularly with a strong work-based learning component (European Commission 2020a) and good quality tertiary education systems, participants tend to expect reasonable earnings returns and other economic and social benefits.

Graph 7: Rates of returns to investment in people at different stages of the life-cycle



Source: Cunha, F. et al. (2006), adapted by EENEE, European Expert Network on Economics of Education (EENEE): www.education-economics.org.

The quality of teachers and trainers is instrumental for achieving quality of outcomes and high inclusion (Hanushek et al 2014). Appropriate salaries can help school systems attract the best candidates to the teaching profession (Dolton and Marcenaro-Guiterrez 2011), and underpin its social status. Non-monetary conditions matter too, in particular high quality initial teacher education (Braga et al 2019) and measures to keep teachers motivated throughout their careers (e.g. career structures, opportunities for professional development, job security) (European Commission 2019a).

Physical environment in schools has an influence on teaching methods and learning processes. Education infrastructure represents on average 8% of education and training expenditure in EU countries and constitutes the largest share of the international and national financial institutions' support to investment in education. Nevertheless, most of the school buildings are not equipped to face the demand for new competencies and pedagogies. Investing in effective learning environment and ensuring that the potential of these new learning spaces is used effectively are two fundamental aspects (OECD 2017b).

Autonomy, coupled with accountability, allows schools to adapt to their students' needs, thus enhancing quality and inclusion. (OECD 2016a and European Commission 2018a). Over the last three decades, many education and training systems have significantly increased individual schools' autonomy over curricula and resource allocation, for instance, *Czech Republic, Lithuania, Netherlands, Slovakia, Estonia, Sweden, Latvia, and Bulgaria* (OECD 2016c). The benefits of school autonomy depend on how prepared schools are to use their responsibility effectively and how accountable they are for their students' outcomes to parents, local communities and education authorities (Hanushek et

al 2013). The effects of school autonomy may also interact with the management capacity of schools: higher management skills tend to be related to better student achievement (Bloom et al 2015).

Socioeconomic diversity of pupils within schools is usually associated with more equitable outcomes, but it can also increase the overall quality of an education and training system (Brunello and De Paola 2017). Some performance differences between schools may be related to the socioeconomic composition of the school's student population or other characteristics of the student body. Residential segregation, based on income or on cultural or ethnic background, may translate into disparities in the quantity and quality of resources (Reardon and Owens 2014). However, disadvantaged students have generally been shown to benefit from sharing school with more privileged peers (OECD 2016d), in particular in *Finland, Denmark, Ireland and Poland*, while the implications for advantaged students have been less clear-cut. Still, recent research has found that socioeconomically diverse schools can be successful at improving achievement of both disadvantaged and advantaged students (Montt 2016).

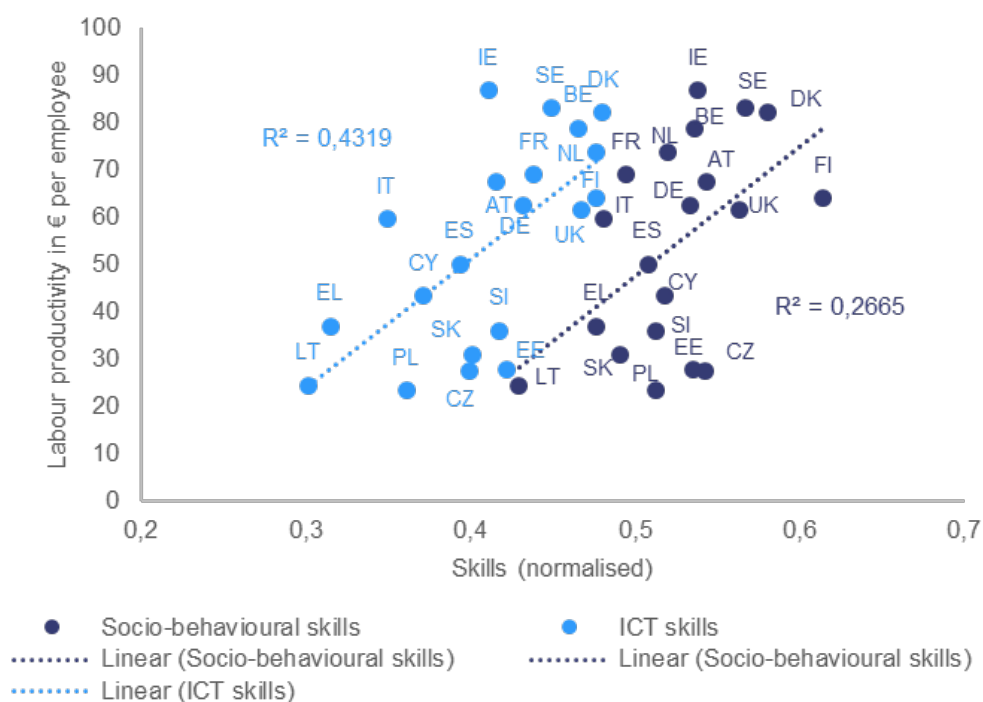
3.2. FOSTERING KEY COMPETENCES FOR THE FUTURE

The transition towards the digital economy will progressively change the set of competences needed. Digital skills play an extremely important role in today's economy and society. However, in 2017, 43% of the EU population as a whole had an insufficient level of digital skills. This evidence points to the need for improvements in this area. At the same time, digital skills will be certainly not sufficient. A wider set of "ICT-complementary" and "transversal" skills can help to face the challenges, and reap the benefits, of digitalisation. Combining specific digital skills with media literacy, socio-behavioural and other transversal competences, including critical thinking, team-work, resilience, communication, self-expression and being creative, seems to be a promising strategy.¹⁷ These competences are likely to foster labour productivity (Graph 10) as they are key to coping with complexity and fast-changing work environments, not only in high-skilled occupations, but also in lower-skilled ones (Morandini et al 2020). In this respect, the 2018 Council recommendation on *Key Competences for Lifelong Learning* sets out eight key competences that all citizens should have: literacy; multilingual; mathematical and science, technology and engineering; digital; personal, social and learning to learn; citizenship; entrepreneurship; cultural awareness and expression.¹⁸ The COVID-19 crisis has seriously disrupted education and training activities across Europe. At the same time, it offers an opportunity to accelerate digitalisation of education and training system, notably by investments in digital infrastructure, digitising learning offers, methods and concepts (including tools such as simulators, virtual and augmented reality) and development of digital skills of teachers and trainers. To avoid reinforcing inequalities, attention needs to be paid to ensuring access to tools and technologies for every learner, teacher and trainer.

¹⁷ The OECD finds for instance that intensive use of ICT skills is associated with more frequent problem solving and greater interaction with others (see OECD 2016e). Media literacy refers to the ability to access media, understand and critically evaluate them and create communications in a variety of contexts. It is strongly related to active forms of citizenship as well as ability to identify disinformation (see McDougall et al 2018).

¹⁸ Council Recommendation of 22 May 2018 on Key Competences for lifelong learning, O.J C 189, 4.6.2018, p. 1.

Graph 8: Relationship between labour productivity and different skills for the future



How to read the graph: Both digital and socio-behavioural skills are positively correlated with labour productivity.

Source: European Commission based on PIAAC, 2012-2015 and EUKLEMS data, 2013.

Skills governance informed by pan-European skills intelligence and graduate tracking systems can help to identify future skill needs for all. Skills intelligence informs prospective students about labour market outcomes of specific training programmes (based for instance on graduate tracking surveys), reports on expected skills needs by growing sectors, the involvement of social partners in the development and update of education and training curricula or effective tools for workforce planning in specific sectors (such as healthcare). Career guidance is crucial to support people in their study choices, helping to navigate what skills will be needed based upon reliable and timely skills intelligence. Skills intelligence aims at improving the quality and relevance of education and training, making skills more visible and comparable and improving information and understanding of trends and patterns in demands for skills and jobs. It is a crucial building block to inform policy making and planning of education and training provision. Similarly, good skills intelligence can support informed investment decisions at company level as well as for the public purse.¹⁹

High quality vocational education and training can play an important role in equipping students with the right skills. Between 2016 and 2030, there will be in total more than 150 million job openings (for new jobs and for jobs replacing existing employees), many them requiring a vocational qualification (Cedefop 2018). The Commission together with Member States continues to cooperate

¹⁹ Cedefop has produced a *pan-European forecast of skills needs* since 2008. Traditional skills forecasts can be complemented by real time skills and labour market data using big data techniques. The first data of this type provided by Cedefop in 2019 analyses over 30 million online job vacancies across seven Member States (CZ, ES, DE, FR, IE, IT, UK). Another source of skills intelligence are *pan-European employers' surveys*. The *EU's Graduate Tracking Initiative* aims at improving the availability of information about the transition of graduates from tertiary education and VET to the labour market.

on modernisation of vocational education and training in line with the policy priorities defined in the 2015 Riga Conclusions.²⁰ However, vocational education and training systems face numerous challenges. In many EU Member States, there is a persistent lack of attractiveness of vocational education and training-based jobs and careers - partly due to popular misconceptions about vocational education and training, but also partly due to real gaps in the quality and labour market relevance of vocational education and training. Work-based learning is still not accessible to the majority of vocational education and training learners in Europe (European Commission 2018b). Vocational education and training provision could embed stable core and flexible elements in order to provide learners with the job-specific skills and key competences that are needed on the labour market. This could be achieved through a learning outcomes-based approach, practical and on-the-job training.²¹ Furthermore, learning in the future will happen increasingly outside of the formal classroom, which raises the importance of validation and documentation of skills acquired in a non-formal and informal context, as recognised by the 2012 Council Recommendation²².

Focus also needs to be on putting in place systematic and coherent upskilling and reskilling for low-skilled adults. A large number of adults in Europe are disadvantaged due to low levels of skills or their obsolescence. In 2018, around 25.5% of all adults aged 25-64 (nearly 60 million) had at most achieved a lower-secondary level of education.²³ Even more worryingly, in some European countries up to nearly 40% of adults seem to possess only a very basic level of literacy or numeracy skills, or both (OECD 2016b). The *EU Upskilling Pathways initiative*, adopted in December 2016, targets low skilled adults who will benefit from three interlinked types of provision: an assessment of the skills they possess, a tailored package of education/training, and the validation of the skills they have acquired.²⁴ The intention is that this provision should set them on the pathway to further education and training, if they wish.

Education and training systems need to adjust and adopt a more responsive model to cater to the changing skill needs. In times past, education and training completed in formative years was a gateway to a successful career. Today, and even more tomorrow, initial education and training is not enough to last a lifetime, although it remains fundamental (Graph 11). New challenges, new opportunities and a series of transitions call for boosting lifelong learning. Between 2000 and 2014, job tenure of 10 years and over decreased from 17.5% to 12.5%, while job tenure for 3 to 5 years increased from 17.7% to 19.4%. It follows that one might soon have 15-20 different jobs in a lifetime.²⁵ It is estimated that 54% of the existing workforce will need re-or upskilling by 2022 (World Economic Forum 2018). In order to increase adaptability to change, competitiveness, to limit lay-offs and to minimise the down times between transitions, knowledge, skills and attitudes are a key asset and new ways to stimulate more continuing education and training need serious consideration.

²⁰ The 2015 Riga Conclusions defined five objectives for the period until 2020: 1) promotion of work-based learning, 2) development of quality assurance in VET and information and feedback loops, 3) access to VET and qualifications for all, 4) strengthening of key competences and 5) professional development of teachers and trainers in VET. Available at <https://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=7915&furtherPubs=yes>.

²¹ Opinion of the Advisory Committee on Vocational Training on the future of VET, 2018.

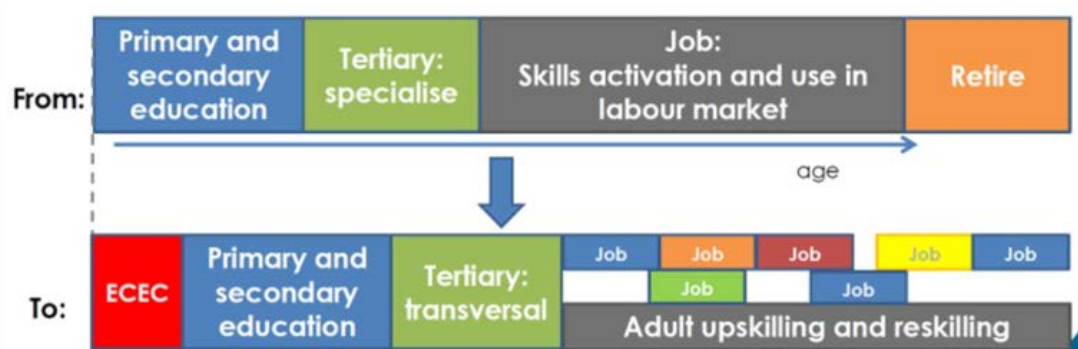
²² Council Recommendation of 22.12.2012 on the validation of non-formal and informal learning.

²³ Eurostat, EU Labour Force Survey.

²⁴ Council Recommendation of 19 December 2016 on Upskilling Pathways: New Opportunities for Adults 2016/C 484/01.

²⁵ EPSC – Commission (2016).

Graph 9: New models of skills development



Source: OECD.

3.3. EXPLORING WAYS OF FINANCING EDUCATION AND TRAINING INCLUDING THROUGH EU FUNDS

In Europe public funding is the main source of spending on education at the primary and secondary level, but also in most higher education systems of the Member States. This public intervention is motivated by two factors: (1) social benefits are likely to exceed private benefits that accrue to individuals. Without public investment correcting for this “market failure”²⁶ there would likely be under-investment in education and training since individuals cannot appropriate the full returns; (2) Equity considerations: education and training provides strong support for social mobility by the provision of equal access to education and by further compensatory interventions to support disadvantaged students.

The private sector is covering part of the investment burden in adult upskilling and reskilling. For example, in 2015 EU private sector companies with at least 10 employees (representing around 50% of all jobs) invested EUR 60.6 billion in training their employees²⁷. Public sector employers (representing nearly 25% of all employment in the EU) or micro-companies (nearly 30% of all employment) likely invest in training at comparable levels. The public sector investment in adult upskilling and re-skilling is relatively moderate as compared to much more significant investment in initial education and training. By some earlier estimates (European Commission 2013), EU Member States invest between 0.1% to 0.5% of GDP into adult re-training and upskilling, rather modest volume as compared to 4%-6% of GDP dedicated for initial education and training systems.

Various methods for financing education and training also through private contributions have been used. At the primary and secondary stage a small share of private schools exist in Europe. At the tertiary stage, co-financing for example through tuition fees combined with income-contingent loan systems as in *Netherlands*, is used. Other financing methods include for example (tax or financial) incentives for the private sector such as individual learning accounts or – as has recently been promoted by EU institutions - public-private partnerships. The concrete examples mentioned in this note are presented to provide an insight into Member States’ policies in this area without making any judgement in terms of efficiency and effectiveness, including equality of opportunities.

²⁶ A market failure is an economic term for that describes a situation in which there existed another conceivable outcome where an individual may be made better-off without making someone else worse-off. Market failures arise for example due to information asymmetries or market power.

²⁷ Eurostat (2015), Continuing Vocational Training Survey.

Attempts to link public funding to accountability and to shift towards performance-based funding while ensuring an optimal teaching capacity, have tried to improve effectiveness and efficiency. In some EU countries, there is a shift towards such schemes in particular in higher education.²⁸ Linking funding to performance measures (such as completed degrees or enrolments) creates incentives for providers to deliver output.²⁹ To ensure that the quality of the output is maintained, accompanying quality assurance mechanisms are typically put in place. In *Denmark* higher education institutions receive basic funding as well as activity funding and result funding (on the basis of completion and graduate employment at the institutional level). Funding is thereby closely connected to education provision and creates incentives to produce results. A ‘hybrid’ system containing a fixed part (guaranteeing capacity independent of student enrolment) and a variable performance-based part (promoting efficiency in educational production) was introduced, for example, in the *Netherlands* (Canton et al 2001).

EU Member States have attempted with different forms of financial incentives to encourage or enable individuals to engage in high quality continuing education and training. *Individual Learning Accounts*, introduced for instance in *France* in 2015, provide individuals with the resources to take up learning on their own initiative and make learning rights portable from job to job (including unemployment spells). *Training vouchers*, which support training through direct governmental payments, sometimes with a contribution from the participant, have also been introduced in the EU, mostly in the 1990s (*AT, BE, DE, ES, FR, IE, IT, NL, PT, UK*) and the world (e.g. in *Canada, Switzerland, the United States* or *Singapore*). Other tools are *National Training Entitlements*, such as implemented in *Australia*, that enable all eligible working age Australians to access a government subsidised training place. Several EU member states have also implemented *Training Funds* aimed at building up a training supply within a specific industry (such as *BE, DK, ES, FR, IT, CY, NL* or the *UK*).

Tax incentives for education and training by the private sector are also used in many EU Member States. The tax treatment of education and training expenditures substantially differ among EU Member States. Many Member States (e.g. *AT, BE, CZ, DK, EE, FR, FI, DE, IE, IT, LU, NL, PT, SE* and *UK*) provide *employee social security contribution reductions* or (*tuition*) *tax credits and deductions* under their personal income tax system to encourage private skills investment (such as through *Learning Accounts* as mentioned above). Many Member States (e.g. *AT, BE, CZ, DK, EE, FR, FI, DE, IE, IT, LU, NL, PL, PT, SK, SI, ES, SE*, and *UK*) also allow companies to *deduct training expenses* under the corporate income tax system. In addition, some Member States apply *employer social security contribution reductions* or *corporate tax incentives for apprentices* (e.g. *AT, BE, FR, IT*, and *ES*). It is important to ensure that such incentives do not cause economic distortions. Tax incentives that are not targeted or means-tested may favour large enterprises, high skilled individuals and those with best access to education and training.

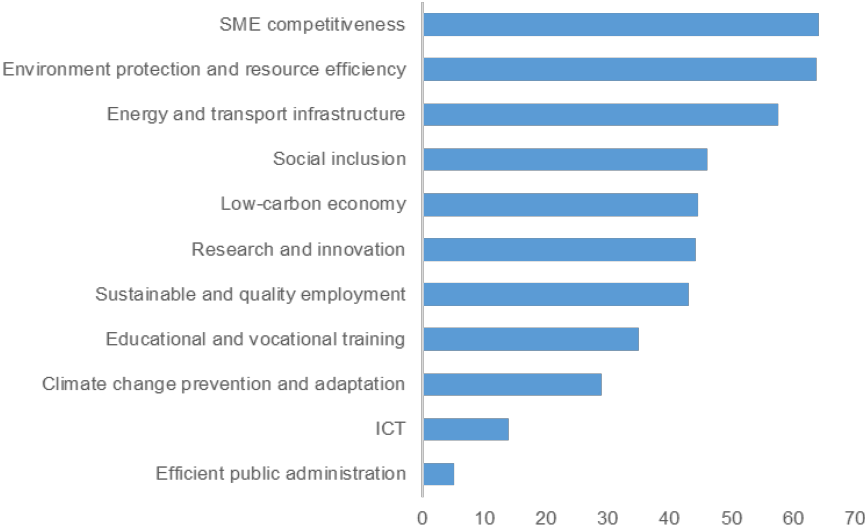
²⁸ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a renewed EU agenda for higher education COM(2017) 247 final and Commission Staff Working Document accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a renewed EU agenda for higher education SWD(2017) 164 final.

²⁹ Commission Staff Working Document accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a renewed EU agenda for higher education SWD(2017) 164 final.

Several investment strategies to improve in particular the quality of school infrastructures have been put in place across the EU. In the face of demographic pressures and the need to expand its school network, the *Flemish Community of Belgium* has attracted private investment through *Design-Build-Finance-Maintain* schemes. With a total investment of EUR 1.5 billion, the public-private partnerships involve the construction of 200 new low-energy facilities, increasing the number of schools by more than 5%. *Portugal* started a consolidation process to address the school network’s inefficiency and regional inequalities in 2005. Within a decade, Portuguese educational authorities closed 47% of the country’s public schools - most of them primary schools in rural areas - and nearly all public schools (98%) were re-organised into clusters comprising schools from one or more education levels under a single administration. Incentives to affected families, including free transport, were provided to allow for smooth implementation and inclusiveness (OECD 2018).

As the benefits of investing in people go beyond national borders, EU-level action can complement national policies. The EU budget aims at strengthening cohesion and building more resilient and inclusive societies. In 2014-2020 the *European Structural and Investment Funds* (ERDF, ESF, CF) have been investing in education and vocational training (more than EUR 35 billion), promoting sustainable high-quality employment (EUR 43 billion), social inclusion (EUR 46 billion), upgrading the digital dimension of the EU (EUR 14 billion) or fostering R&D and innovation (EUR 44 billion) (Graph 12). On top of that, specific programmes such as the *Horizon 2020* (EUR 77 billion) finance projects across the EU in research, development and innovation and *Erasmus +* (EUR 15 billion) in education and training. The Commission has proposed to strengthen the social dimension and the EU added value and to reduce fragmentation of the EU budget for 2021-2027 through a reinforced *European Social Fund+* and an increase of financial resources devoted to the specific programmes of R&D&I (*Horizon Europe*) and education and training (*Erasmus+*). The Commission has also proposed a new *Digital Europe Programme* specific to foster the digital dimension of the EU.

Graph 10: Thematic breakdown of the European structural and investment funds, Total 2014-2020 (in billion EUR)



Source: European Commission.

Moreover, the **Recovery and Resilience Facility** at the heart of NextGenerationEU, powered by €72.5 billion in grants and loans, provides Member States with ample opportunity to prioritise investment in people’s competences at all levels of education and training, with a particular focus on digital education and upskilling and reskilling initiatives, with the appropriate reforms in place,

notably the flagship project “reskill and upskill - the adaptation of education systems to support digital skills and educational and vocational training for all ages”.³⁰

The new InvestEU programme places an increased emphasis on social investment and skills of for the new EU budget. The new *InvestEU* programme includes a dedicated *Social Investments and Skills Window*, which will support investments in areas such as education and training, social entrepreneurship and social innovation, microfinance, social infrastructure and services and financing models in the areas of education and training, health and social housing.³¹ The investment window will be flanked by the *InvestEU Advisory Hub*, which will provide comprehensive advisory assistance. It could potentially promote innovative education and training services, such as provision of guidance, skills forecasting, skills assessments and validation services or services helping to match the demand for and supply of skills as well as education-business partnerships and centres of excellence, including centres of vocational excellence.

3.4. FOSTERING SYNERGIES WITH COMPLEMENTARY STRUCTURAL POLICIES

Complementary structural policies can make investments in education and training more powerful in achieving their objectives. For example, reforms to promote business-friendly regulation could foster the demand for skills (e.g. by removing barriers to firm entry, exit and growth or by promoting skill-intensive sectors) (Vandeplass and Thum-Thysen 2019). This, together with policies to promote the supply of appropriate skills, could reduce levels of skills mismatches in the labour market. Economic policies could also foster synergies with investment in intangible capital, in particular through facilitating access to finance, crowding-in private investment, direct public support (such as investing in R&D and building a strong science base), and promoting a flexible regulatory framework to foster profitability and flexible (re-) allocation of resources (Thum-Thysen et al 2017). In order to ensure smooth and successful transitions in times of disruptive change, social policies can act as a ‘buffer’ to secure income protection for individuals and (macro-)economic stabilisation and thereby help maintain a strong economic base also in terms of its social dimension (Hemerijck 2018). Entrenched inequality may lead to underinvestment in human capital, especially for the least well off, reducing potential growth and further reinforcing inequality of incomes and of opportunity. Social policies can also bolster the home learning environments of students and thereby contribute to skill formation. Finally, labour market policies, including the role of social partners, can have an important impact on the incentives for (private) investment in education.

EU-level policy coordination, for instance through the European Semester, could be useful in identifying and promoting such synergies. The European Semester’s 2020 Country-Specific Recommendations (European Commission 2020b)³² already placed strong emphasis on education, training and skills and compared to previous years the Country-Specific Recommendations addressing education, training and skills cover all Member States. This trend underlines the increasing policy focus on the relevance of people’s competences and may require a further investigation of challenges

³⁰ https://ec.europa.eu/commission/presscorner/detail/en/IP_20_1658.

³¹ For instance, under the European Fund for Structural Investment, the predecessor of InvestEU, a project for the University of Latvia to build state-of-the-art research and study facilities helps finance the construction and equipment of university facilities, thus improving efficiency for the university’s administration, teachers and students.

³² The 2020 European Semester cycle is considered as an exceptional one as its assessment has been heavily affected by the COVID-19 crisis and the Country Specific Recommendations have focused only on the most pressing challenges. For educations and training, distance learning and workforce’s upskilling and reskilling.

in the area of education, training and skills in the Country Reports. In this vein, the 2019 Annual Sustainable Growth Strategy puts particular emphasis on the central role of human capital for growth and employment in a context of rapid technological change and digitalisation. Moreover, the 2019 Country Reports contained, for the first time, a more comprehensive assessment of national adult skills and learning systems on a case-by-case basis, following the adoption by Member States of a benchmarking framework in October 2018. All the Country Reports contain a dedicated analysis of investment, including investment in education.

4. CONCLUSIONS

This paper makes the case that achieving high-quality education and training *for all* requires combining efficiency and effectiveness. This means *doing the right things* and, moreover, *doing them right*. This is a key issue for policy makers in view of the opportunities the current economic and societal transformations offer as well as the challenges the COVID-19 pandemic has posed or exacerbated. The paper points to several policy considerations, which are important for achieving the desired objectives, and which deserve full attention of the policy-makers. Firstly, ensuring quality and equal opportunities in education and training are twin objectives that are fully compatible. In this context, high-quality and accessible early childhood education and care is an essential foundation for successful lifelong learning. Secondly, fostering competences for the future and a digitalised economy include not only digital skills but also a broader set of transversal skills such as media literacy, entrepreneurship, critical thinking, team-work, resilience, communication, self-expression and being creative. Thirdly, while the high social returns to education and training amply justify public funding, exploring smart ways of financing education and training that can stimulate or incentivise the private sector to invest more in skills development can take some of the burden from the public sector. EU funds also play an important complementing role, for example through the NextGenerationEU tool and in particular its flagship project “reskill and upskill - the adaptation of education systems to support digital skills and educational and vocational training for all ages”. Finally, fostering synergies with complementary structural policies can make investments in education and training more powerful in achieving their objectives. To strengthen the link between educational attainment and productivity, policy could support business environment conducive to the creation of skilled jobs, foster synergies with other areas of investment and welfare policies can provide income security during transitions. EU-level policy coordination across different policy areas, for instance through the European Semester, could be useful in this regard and further strengthened.

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TECHNICAL ANNEX

Calculating efficiency scores (Graph 6)

The methodological approach and empirical findings briefly summarised below are comprehensively discussed in Canton *et al.* (2018). The thus obtained estimates of (in-)efficiencies in terms of public spending on education rely on a Stochastic Frontier Analyses (SFA).³³

The corresponding stochastic frontier problem for country i in year t can be written as follows:

$$y_{it} = f(x_{it-1}, \beta) \varepsilon_{it}(z_{it}) \exp(\omega_{it})$$

where y_{it} denotes an educational output, x_{it-1} public spending on education with a lagged effect³⁴, and $f(\dots)$ an (education) production function for country i in time t . β represents a the relationship between spending on education and educational output (proxying an input factor elasticity) while ε_{it} represents the level of efficiency which depends on the environmental factors z_{it} . $\exp(\omega_{it})$ denotes a set of random shocks.

If $\varepsilon_{it} = 1$, country i in time t achieves the optimal output given the production technology $f(\dots)$. If $\varepsilon_{it} < 1$, country i in time t is not using its inputs optimally given the production technology. Technical efficiency ε_{it} is assumed to be positive with the boundaries $0 < \varepsilon_{it} \leq 1$.

Taking natural logarithms of the equation above yields:

$$\ln(y_{it}) = \ln\{f(x_{it-1}, \beta)\} + \ln(\varepsilon_{it}(z_{it})) + \omega_{it}$$

Assuming that the production function is log-linear and defining $u_{it}(z_{it}) = -\ln(\varepsilon_{it}(z_{it}))$, we can write:

$$\ln(y_{it}) = \beta_0 + \beta_j \ln(x_{it-1}) - u_{it}(z_{it}) + \omega_{it}$$

with $u_{it} \geq 0$ as $0 < \varepsilon_{it} \leq 1$.³⁵

This econometric model is estimated on the basis of a panel dataset as the inclusion of time-variation allows relaxing the assumption of time-invariant inefficiencies. Assuming a truncated normal distribution for the inefficiencies, technical inefficiencies in terms of public spending on education are estimated based on the model by Battese and Coelli (1995) for a pooled regression model and respectively on Greene (2005) when including fixed effects in the production function.

³³ The parametric stochastic frontier technique has been chosen (over e.g. Data Envelopment Analysis (DEA)) since the former allows testing for statistical hypotheses, taking account of statistical noise, providing parameter estimates of production factors, elasticities and controlling for relevant country-specific effects.

³⁴ When empirically assessing the returns to spending on education one should be aware that significant time lags occur between the actual spending and obtaining measurable results, such as e.g. achieving a degree, i.e. the latter is subject to accumulated spending over a longer time span and/or building upon earlier education and skill levels. This lag structure is proxied by one year-lag to still keep the number of observations large enough.

³⁵ A key question is how to identify the inefficiency term ($-u_{it}$) through distributional assumptions on u_{it} and ω_{it} (such as assuming a truncated normal distribution for the inefficiencies and a normal distribution for the error terms). See Kumbhakar and Lovell (2000) for more details on how to identify these two error components.

Canton et al. (2018) suggest estimating efficiency scores by following two different approaches: (1) across countries over time ('common EU frontier', i.e. no country specificities taken into account) and (2) within countries over time (i.e. controlling for the specificities of each country's education system by means of fixed effects). These different frontiers can be seen as two extreme cases: A common EU frontier allows evaluating efficiency assuming that education systems are transferable across countries while a country-specific frontier allows relaxing this assumption by considering national education systems as country-specific i.e. not easily changeable, especially not in a short period.

To reflect the dimensions of educational outputs considered as most important, three input-output pairs are looked at: (1) total public spending on all education levels (pre-primary up to tertiary) and tertiary educational attainment (measure of 'quantity'), (2) public spending on compulsory schooling (pre-primary up to secondary) and PISA science scores (proxy for 'quality') and (3) total public spending on all education levels and the rate of the 25-29 year old not in employment, education or training (NEETs)³⁶ (as a measure of 'inclusion'). In this Discussion Paper we concentrate on dimension (2).

Calculating the potential economic effect from improving the efficiency of public spending on education across Europe (Graphs 2 and 7)

In a first step we calculate the level of an educational output that can be achieved by maximising efficiency of public spending on education (i.e. reducing inefficiencies to zero) E^* . For this calculation we use the efficiency scores and the framework by Canton et al. (2018) described above. In a second step, we calculate the gain in GDP per capita growth potentially arising from increasing the educational output to its efficiency maximising level.

To obtain the gain in GDP per capita growth we use a measure of social returns to education (i.e. an estimate of the relationship between educational output and economic performance) from the literature. Per country, we calculate:

$$\Delta Y = \beta \Delta E^*$$

where ΔY is the change in economic outcome (we choose GDP per capita growth) that can be achieved by reducing inefficiencies in public spending on education to zero. β is a measure taken from the literature on 'social returns to education' (i.e. the expected economic impact from a change in educational output). The estimates of β taken from the literature (Balart et al. 2018, based on Hanushek and Woessmann 2012) imply that an increase in PISA scores of 100 points is associated with a 1.2 percentage point increase in annual GDP per capita growth. An increase of around 100 points on the PISA science test score scale corresponds to the difference between the average Peruvian student and the rest of the OECD in 2015. In our sample, the increases in PISA science scores stemming from efficiency improvements range from 31 in Estonia to 136 in Cyprus.

The β coefficient taken from the literature could suffer from an endogeneity bias. Hanushek and Woessmann (2012) and later also Balart et al (2018) conduct a series of robustness checks in this regard, such as for example by controlling for possible omitted variables (geographical location, political stability, capital stock, population growth and school inputs), which do not significantly affect the estimated impact of cognitive skills.

³⁶ The interpretation of the NEET indicator requires caution. It touches upon several areas such as unemployment, early school leaving or labour market discouragement. See Elder (2015) for a discussion on its interpretation.

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