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Equity in Education in Europe

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Equity in Education in Europe

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Abstract

This technical brief provides a literature review on equity in education in Europe. It updates a report produced for the European Commission in 2006 and provides insights into the research and policies that have been undertaken during the last decade. Its focus is on early childhood and care, primary and secondary education and on the different aspects related to equity in education that have surfaced during the last years. Therefore, this brief includes a broader set of topics concerning equity in education, such as regional asymmetries, gender inequality and immigrants' integration.

In this brief, equity "is viewed as the extent to which individuals can take advantage of education and training, in terms of opportunities, access, treatment and outcomes" (European Commission 2006, p. 2). Achieving equity in education is a particularly important policy priority, as the evolution, causes and consequences of social, educational and economic inequalities have been a hotly debated and controversial issue given the recent economic crisis in Europe. For these reasons, this brief provides an overview of recent evidence-based research and policy measures, which can inform future policy initiatives in Europe aimed at increasing equity in early childhood, primary and secondary education.

In sum, the evidence reviewed indicates that, taking a life-cycle approach to education, equity has to be achieved at the earliest education stages. In other words, the provision of equitable and quality early childhood education and care needs to be a priority in any equity considerations. Furthermore, the quality of teachers plays a prominent role in achieving high and equitable educational results. The results for achieving equity through school choice depend heavily on its specific contextual implementation. Current indicators suggest that there are large differences in educational equity between and within EU Member States. Similarly, distinguishing among gender and immigrants' status reveals significant gaps among various subpopulations, and these specific gaps have to be considered in future policies.

The brief's concluding message is that 'one size fits all' policies do not appropriately address the needs of diverse learners in different countries. Policies have to be tailored to specific contexts and populations. Just importing policies from other countries without further analysis may not work – the particular local contexts and stakeholders have always to be taken into account. Still, giving more priority to early childhood education and care and improving teacher quality in schools are certainly initiatives that contribute to achieving higher equity levels. However, more research and data are a necessary requirement to enhance future research-based policy actions.

1 Introduction

A decade ago Wößmann & Schütz (2006), both members of the European Expert Network on Economics of Education (EENEE), prepared an analytical report for the European Commission on the efficiency and equity in education systems in Europe (see also European Commission, 2006; Wößmann, 2008). The aim of this report was to give recommendations about how to develop and implement policy reforms in the EU Member States.

Now, exactly a decade later, it is timely to update the original EENEE report by reviewing state-of-the-art research related to equity in education and the policies that have been proposed and implemented since 2006. More specifically, this technical brief considers early childhood education and care, primary and secondary education. Furthermore, different aspects of equity in education, such as immigrants' education, have become more pressing issues during the last years. Therefore, it also includes a broader set of topics concerning equity in education. Moreover, while we will focus particularly on the EU we will also consider other relevant countries like the US and various countries in East Asia. The inclusion of these other countries in this review allows us to enlarge the European perspective and to see how the European policies compare to other highly developed countries. This comparison results in a broader perspective with potentially richer and more policy-relevant recommendations.

In this context, it is important to clarify first what is meant by equity in educational systems. We refer here to the definition of the original 2006 Communication, in which equity "is viewed as the extent to which individuals can take advantage of education and training, in terms of opportunities, access, treatment and outcomes. Equitable systems ensure that the outcomes of education and training are independent of socio-economic background and other factors that lead to educational disadvantage and that treatment reflects individuals' specific learning needs" (European Commission, 2006, p. 2).

Equity in education is important as it is a crucial topic for policy makers. For example, it is one of the priority areas of the strategic framework for European cooperation in education and training (ET 2020) (European Commission, 2014b, 2016; European Council & European Commission, 2012). Furthermore, Checchi, Peragine, & Serlenga (2016) also emphasise that, first, redistributive policies are controversial and their acceptance in the population depends significantly on the information or perception of the roots of social and income inequalities, shaping the popular attitude towards such policies (Alesina & La Ferrara, 2005). Given equal opportunities (and thus with results depending on 'effort'), one would expect a low level of popular agreement, whereas the reverse would be true if opportunities are unequally distributed in the population (and outcomes are merely dependent on 'circumstances'). Second, differences in economic performance are better explained by unequal opportunities than by inequalities in income because opportunity inequalities can lead to inequality traps of parts of the population (e.g., Bourguignon, Ferreira, & Walton, 2007; Marrero & Rodríguez, 2013; World Bank, 2006). Third, considering inequalities in opportunities enables us to understand the 'deep' factors that underlie the creation of income inequalities. Unfortunately, they are also more persistent (see Checchi et al., 2016) and more difficult to tackle by public policy, but their analysis provides valuable insights about the population subgroups most affected by inequalities who can benefit the most from policy interventions.

Therefore, the 2006 Spring European Council clearly understood the challenges but also the opportunities of providing equity and efficiency in education by stating that "reforms must be stepped up to ensure high quality education and training systems that are both efficient and equitable. These issues are central to the fulfilment of the EU's objectives in

the Lisbon Partnership for Growth and Jobs and the Open Method of Coordination for Social Inclusion and Social Protection" (European Commission, 2006, p. 2).[1]

Subsequently, research focusing on equity and inequality in education has been a research priority and has flourished over the last years. While cross-country studies may still face significant data restrictions (Checchi et al., 2016), a lot has been learnt using new empirical data. Thus, this brief provides a state-of-the-art overview in the area of equity in education. It is structured as follows: first, we summarise the most important insights of the EENEE report from 2006. Second, we update the literature by explicitly considering the literature that has been published between 2006 and 2016. Third, we consider transversal issues in the area of equity in education. In particular, these are territorial inequality, gender inequality and migration. Finally, the last section concludes.

2 The equity report of 2006

Wößmann & Schütz (2006)[2] indicate that policy-makers have traditionally regarded equity and efficiency to be substitutes. This means that there is supposed to be a trade-off: either one focuses on equity aspects of education, or one concentrates on efficiency – one cannot do both at the same time. Nevertheless, Wößmann & Schütz (2006) argue that this contemporary view is too simplistic and misleading. In fact, it depends on the level of education.

They show that according to current theoretical frameworks, in particular Heckman's theory (e.g., J. J. Heckman, 2000), skill formation can be considered a life cycle process. This process features recursive productivity and complementarity. The term 'recursive productivity' expresses the idea that different stages of skill production are not independent. Instead, skill production in a later level is dependent on the one in lower levels. For this reason, the skills obtained at a lower level can be seen as an input for the skill production at higher levels (e.g. early childhood education contributes to the development of cognitive and non-cognitive skills during primary education). In addition, complementarity describes the fact that the productivity that is generated at a higher level is positively affected by the preceding lower levels (e.g. high-quality early childhood education ensures higher skills and employability). If one combines both of these factors, then one obtains a multiplier effect, i.e., small changes at the lower levels generate larger differences at higher levels.

The policy-relevance of this skills formation theory is straightforward: the returns to investment in early education have to be particularly high because later outcomes are highly influenced by early skill formation. Therefore, governments should focus their attention on the provision of high quality early education. In doing so, many social challenges (e.g., unemployment, crime, etc.) can be alleviated by tackling the roots of educational and social inequalities.

Let us now briefly consider the specific insights on equity in the Wößmann & Schütz (2006) report related to ECEC and schools. Wößmann & Schütz (2006) argue that it is difficult to decrease inequity in education by simply investing more financial resources into disadvantaged pupils at school. In other words, more quantity of spending does not automatically lead to better quality of education. Instead, two aspects have an influence on equity: whether an education system involves tracking and whether preschool education is widespread. Tracking negatively affects disadvantaged pupils because they are sorted to lower quality schools and do not get the chance to benefit from skill-

[1] Efficiency "involves the relationship between inputs and outputs in a process. Systems are efficient if the input produces the maximum output. Relative efficiency within education systems is usually measured through test and examination results, while their efficiency in relation to [the] wider society and the economy is measured through private and social rates of return" (European Commission, 2006, p. 2).

[2] See also Wößmann (2008).

increasing spillovers that may be generated by having contact with more skilled pupils. Similarly, preschool education sector's size affects equity because limited access leads to larger differences in later educational outcomes and employment conditions. While "education for all" is still far from being achieved in other world regions, Europe has already achieved a high education level, as measured by years of schooling (OECD, 2014b).

Overall, Wößmann & Schütz (2006) suggest that there are significant complementarities between efficiency and equity when investing in the early phases of educational development. In contrast, a trade-off appears to exist in later phases. In general, they propose not to keep the past focus on inputs in the education system but rather to concentrate on the outcomes. As most stakeholders are interested in whether the educational results of pupils have improved (in equity terms, e.g. the difference between the most and least skilled) rather than the levels of inputs (e.g. the number of teachers), policies should rather be directed towards the former. As such, Wößmann & Schütz (2006) propose to implement institutional reforms, to create unambiguous and easily-comprehensible standards and regular monitoring, and to enforce more choice and more competition in the educational system. For the various levels of education, the following recommendations are made. Policy makers should focus on…

- In ECEC: … larger provision, accountability and intensity.
- In schools: … autonomy coupled with accountability, competition sponsored by public funding, teachers receiving rewards for their performance, and detracking the school system.

However, while Wößmann & Schütz (2006) provide a valuable list of recommendations, it is important to note that they do not deem it to be the ultimate 'truth'. Instead, they qualify their conclusions by stating that the evidence base was still in its infancy; in particular empirical studies for Europe were lacking and more data and research were needed when they wrote their report.

Fortunately, Wößmann & Schütz' (2006) (and in consequence, the European Commission's) call has been heard by the research community. For this reason, research on equity issues in education has been increasing over the last decade. Thus, more and more detailed empirical data are now available and many more studies have contributed to a better understanding of educational systems since Wößmann & Schütz' (2006) original contribution.

3 Literature update (2006-2016)

3.1 Brief overview of recent research on educational reforms

There have been literally hundreds of educational reforms across the EU and OECD countries during the last decade. This shows that countries have been paying attention to education and have acted upon the challenges that were pointed out by Wößmann & Schütz (2006).

For example, we can get a clearer understanding of the policy priorities in education between 2008 and 2015 using OECD data (OECD, 2016a). The database includes 749 educational reform activities at all levels of education across OECD countries.[3] We divide OECD countries into EU countries[4] and non-EU countries to offer an overview of the reforms that have taken place in EU Member States and how they compare to other non-OECD countries.

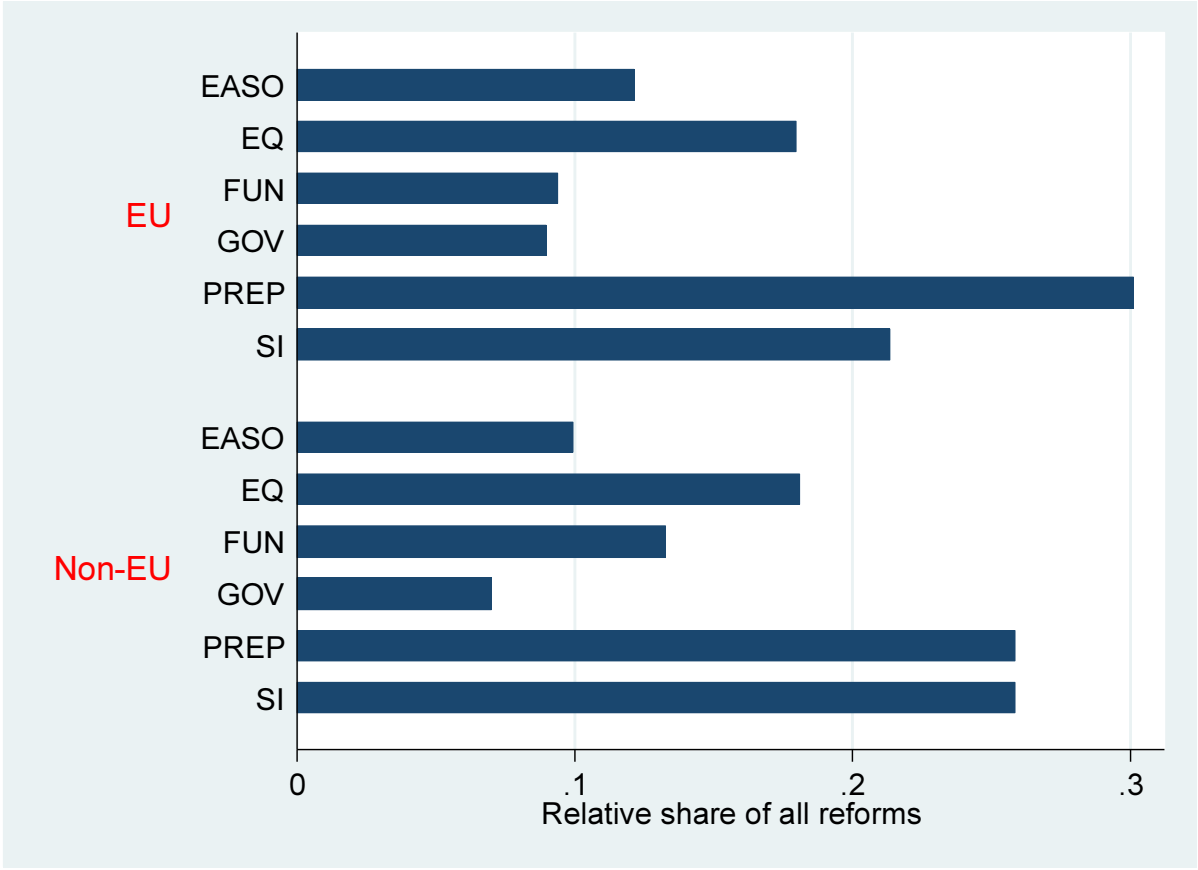
[3] We include all reforms at all educational levels (i.e., also higher education) because a clear distinction between the various levels of education is not possible.
[4] Note that, however, not all EU Member States are part of the OECD, so that data are not available for all EU countries.

In total, 478 educational reforms were implemented in EU countries (which are part of the OECD) and 271 reforms were undertaken in other OECD countries. However, it has to be clearly stated that the quantity of reforms is not equivalent to the quality of reforms. In other words, one large reform in one country can have a larger impact than, for example, five smaller reforms in another country. Unfortunately, we cannot further differentiate among the reforms, so that the subsequent statistics only provide a rough idea of reform priorities.

The OECD divides educational reforms into several broad categories: Equity (and Quality) (EQ), Evaluation and Assessment to Improve Student Outcomes (EASO), Funding (FUN), Governance (GOV), Preparing Students for the Future (PREP) and School Improvement (SI).[5]

As Figure 1 indicates, EU countries which are part of the OECD have had most reforms in the area of PREP (30 %), followed by SI (21 %). Fewer reforms have been undertaken in FUN (9 %) and GOV (9 %). Interestingly, the comparison with the relative shares of these categories in non-EU OECD countries shows that EU countries have focussed in relative terms more on PREP. The particular emphasis on this educational area has certainly been driven by the relatively high unemployment rates, in particular among young people, in many EU countries.

Figure 1 Distribution of education reforms by policy lever in OECD, 2008-2015



Source: Data by OECD (2016a), own analysis.
Note: Data on the EU are only available for the 22 EU countries which are part of the OECD.

[5] For more information on the details of the classification categories, see OECD (2015e, 2016a).

After this 'bird's view' on educational reforms during the last years, let us now proceed to investigate more in detail the educational policies and the research that has been done in the various education and training areas in early childhood education and care, primary and secondary education. Braga, Checchi, & Meschi (2013, 2011) provide a concise literature review and dissect the various types of educational institutions. First, the authors state that pre-primary education has been shown to have positive effects in both equity and efficiency terms.

Second, reforms aiming at increasing compulsory education have been shown to have an overall positive effect on educational attainment (Brunello, Fort, & Weber, 2009; Murtin & Viarengo, 2011), while labour market earnings may not necessarily be affected (Dobkin & Ferreira, 2010).

Third, school tracking has mostly a negative effect on equity because selecting students into different educational tracks, vocational versus general education, increases the importance of family background (e.g., Brunello & Checchi, 2007).

Fourth, school accountability (i.e., existence of 'external exit exams') appears to have a rather inequality increasing effect. The reason for this is that schools facing higher accountability standards may increase their selectivity of students and teachers may put more emphasis on the best performing students (Hanushek & Raymond, 2004). On the other hand, better students are further pushed and incentivised to excel, whereby not only the average performance but also the overall range of the distribution of educational results increase. However, other research paints a different picture (e.g., Schütz, West, & Wößmann, 2007), which indicates that more research needs to further clarify this point.

Fifth, school autonomy does not have a clear impact on equity. While the literature is rather limited, it may be best coupled with accountability measures.

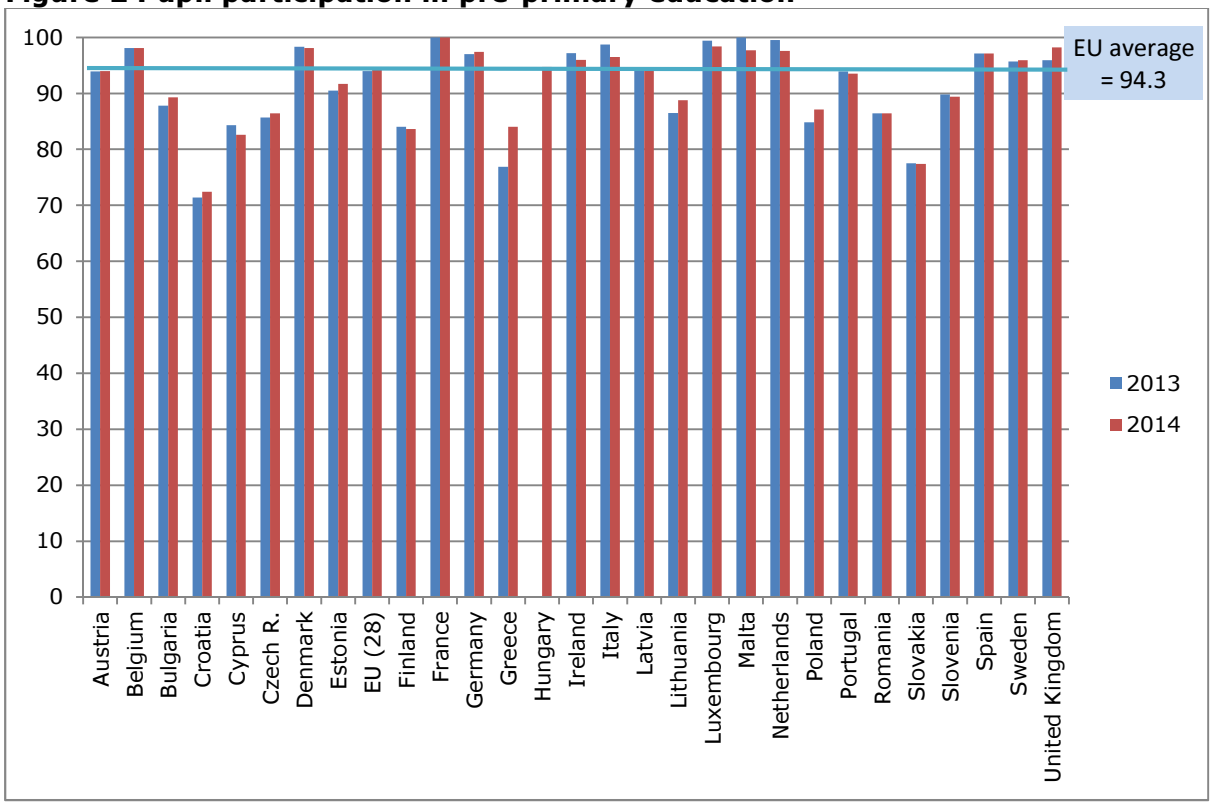
Sixth, the quality of teachers is certainly important but difficult to measure using survey data, as one cannot observe what an "ideal teacher" . Still, an important factor may be the salary in order to attract good personnel to the profession. A relevant indicator recently reported by the OECD gives information about how much similarly educated professionals earn. This provides a view of how attractive teaching is in a given country (OECD, 2015d). Therefore, this indicator may further improve the understanding of this aspect in the future.

In the following section, we consider a number of these aspects of education and their relationship with equity issues in more detail.

3.2 Early childhood education and care

Investing in ECEC is considered the most efficient measure to promote equity. Evidence indicates that laying the foundations for later learning in the early years makes a significant contribution to skill formation over the life cycle (J. J. Heckman & Corbin, 2016) and helps prevent early school leaving (European Commission, 2014c). The recently developed framework for quality in ECEC (European Commission, 2014c) stresses the importance of quality assurance and lays out the dimensions that should guide the development of ECEC programmes. These include accessibility, staff qualifications, curricula guidelines, monitoring and evaluation criteria and options regarding funding and governance. This focus on quality is all the more important if we consider that the ET2020 benchmark concerning ECEC is almost met at the EU level and very close to being reached by most EU Member States. That is, as reported by Guerin (2014), the European Commission agreed in 2009 that at least 95% of children between the age of 4 and the start of compulsory school should participate in ECEC. As of 2014, as Figure 2 below shows, the EU average participating rate is 94.3%. Although in some countries, such as Croatia and Slovakia, the participation rate is still below 80%, in the great majority of Member States that rate is above 90%.

Figure 2 Pupil participation in pre-primary education



Source: Eurostat (2016b).
Note: The variable refers to the "[p]upils between 4 years and the starting age of compulsory education – as % of the corresponding age group" (Eurostat, 2016b).

As Table 1 below shows, some Member States have expanded pre-primary education (e.g. Austria) and implemented integration programmes for children from disadvantaged backgrounds (e.g. Lithuania). The United Kingdom has also extended support to children in the home and the Step by Step programme in Bulgaria and Romania includes a curriculum that focuses on child-centred practices and problem-solving. Future research should appropriately evaluate the impact of these policy interventions to provide valuable lessons for other European countries.

Table 1 Pre-primary policies and interventions

Country	Policy name/ interventions	Description
Austria	Free compulsory year of pre-primary education.	In 2010, Austria introduced a free compulsory year of pre-primary education with language learning support and a nation-wide curriculum.
Bulgaria	Step by Step	A community-based project that promotes child-centred practices and problem-solving.
Romania	Step by Step	A community-based project that promotes child-centred practices and problem-solving.
Lithuania	National Minority Integration into Lithuanian Society Program	Aims at assisting immigrant workers and immigrants, it focuses on sociocultural integration and language learning for immigrant children, especially Roma children.

United Kingdom	Sure Start	Aims at breaking the intergenerational transmission of inequalities. Targets families with children below 4 in disadvantaged areas, providing home visits and childcare.

Source: European Commission (2014a).

ECEC facilitates later learning, especially for children from disadvantaged backgrounds, and different studies have confirmed that the positive effect of early interventions persists in secondary school and in adult life (Fuchs & Wößmann, 2004; OECD, 2014a; Schütz, Ursprung, & Wößmann, 2005). Fuchs & Wößmann (2004) show that kindergarten attendance in European countries and particularly pre-school reading performance are associated with higher reading performance at the end of primary school, even after controlling for family-background and school effects. Schütz et al. (2005) find similar effects between the length of a country's pre-school education system and mathematics and science performance in middle school. More recently, analysis of the PISA survey (OECD, 2016c) shows that students who have attended pre-primary education for more than one year perform significantly better in reading and mathematics than students who attended pre-primary education for a shorter period of time. This finding is ubiquitous across EU Member States, as well as in other OECD and partner countries.

Corroborating evidence about the positive impact of pre-primary attendance on future cognitive skills now exists for some Member States. For instance, in the UK early provision was found to result in higher education achievement in literacy, maths and social development for students between the ages of 11 and 16 (Sammons et al., 2011; Sylva et al., 2012). Similarly, in France studies show that preschool expansion was correlated with higher qualifications and higher employment rates until age 33 (Dumas & Lefranc, 2010; Melhuish, 2011).

Importantly, the positive effects of attending pre-primary education extend beyond cognitive skills to include better employment prospects, socio-emotional skills and health (Benítez, Fernández, Justicia, Fernández, & Justicia, 2011). Examples of programmes that yield great returns in terms of all these aspects are the Perry and the Abecedarian programmes in the United States. Several studies confirm that children who attend these high quality programmes have a reduced chance of early school leaving, reduced crime incidence, better health and better chances of employment in adult life (Guerin, 2014; J. J. Heckman, Moon, Pinto, Savelyev, & Yavitz, 2010).

Taken together, these findings suggest that the quality of programmes matter and that early interventions yield better returns on a range of outcome measures which are related both to cognitive and to non-cognitive skills. Non-cognitive skills such as motivation and personality traits that include self-control, perseverance and openness to experience influence life outcomes. Importantly, these skills appear to be more malleable to change during the early years (Brunello & Schlotter, 2011; Mischel, 2014), which suggests they should be a part of preschool curricula. Fortunately, the number of studies in Europe that measure the impact of preschool programmes is increasing and data collection increasingly focuses on gathering cognitive and non-cognitive measures. For example, the effects of the Reggio Emilia preschool programme in Italy, considered as a high quality programme that stresses cooperative problem-solving, is currently being evaluated by the Center for the Economics of Human Development of the University of Chicago (CEHD; L. Heckman, 2014). Developing the whole person is a key objective of the Reggio Emilia programme and the impact evaluation carried out by CEHD looks at life outcomes related to health, income, social integration and socio-emotional skills. As Heckman & Corbin (2016) state: "[a]n important lesson from the recent economics of human development is that cognitive skills are only part of what is required for success in life. Personality traits—i.e., "soft skills," like trust, altruism,

reciprocity, perseverance, attention, motivation, self-confidence, and personal health—are also important" (p.10).

As Member States work to achieve the EU Barcelona objective of attaining an ECEC participation rate higher than 33% for children under 3, it would be desirable to concomitantly gather more data on the impact of different programmes for this younger age group. Additionally, more studies are needed on the role of preschool education in promoting a good start. Evidence already exists to support early interventions, but it was mostly gathered in the US. As Heckman & Jacobs (2009) argue in "Policies to create and destroy human capital in Europe", greater emphasis should be placed on family policies, such as access to quality preschool education, because education investments in the early years of human development increase equity. Intervening later in the life cycle, during adolescence for example, implies a trade-off between equity and efficiency (Cunha, Heckman, Lochner, & Masterov, 2006). That is, countries would get a much lower return for their educational investment.

Since it is now documented that positive results can accrue form family-oriented policies and interventions it would also be desirable to promote and study the impact of different initiatives in Member States. This would allow for a better understanding of how to intervene in the home environment to stimulate disadvantaged children and increase social integration and mobility (J. J. Heckman & Jacobs, 2009). For instance, Araújo & Costa (2015) and Brooks-Gunn & Markman (2005) show that parental education is related to reading achievement at the fourth grade level. However, children of parents who have low educational levels but who read to them frequently before the start of compulsory education have higher achievement than those whose parents did not. Similarly, Martin et al. (2013) and Soto-Calvo & Sanchez-Barrioluengo (forthcoming) find that early literacy and numeracy abilities are positively related to mathematics and literacy achievement in fourth grade.

It is not always possible to discern how home and school environments interact to support skills' development. However, what we know to date suggests that they can and should complement each other. For example, stimulating young children's language acquisition via home book reading can by itself make a difference and in conjunction with a quality ECEC programme that also stimulates language development it can even make more of a difference. Providing literacy resources, namely children's literature, at school and bringing books home via borrowing programmes and home-school partnerships can help bridge the achievement gap between more and less advantaged populations (Araújo & Costa, 2015; European Commission, 2012).

In sum, recent evidence suggests that Member States should attend to the quality of pre-primary programmes and implement early childhood education interventions that encompass not only cognitive activation, but also target the social and emotional development of children. Moreover, evidence suggests that home interventions help narrow the skills gap between advantaged and disadvantaged populations, both for children under 3 years of age and for those between 3 years of age and the start of compulsory education.

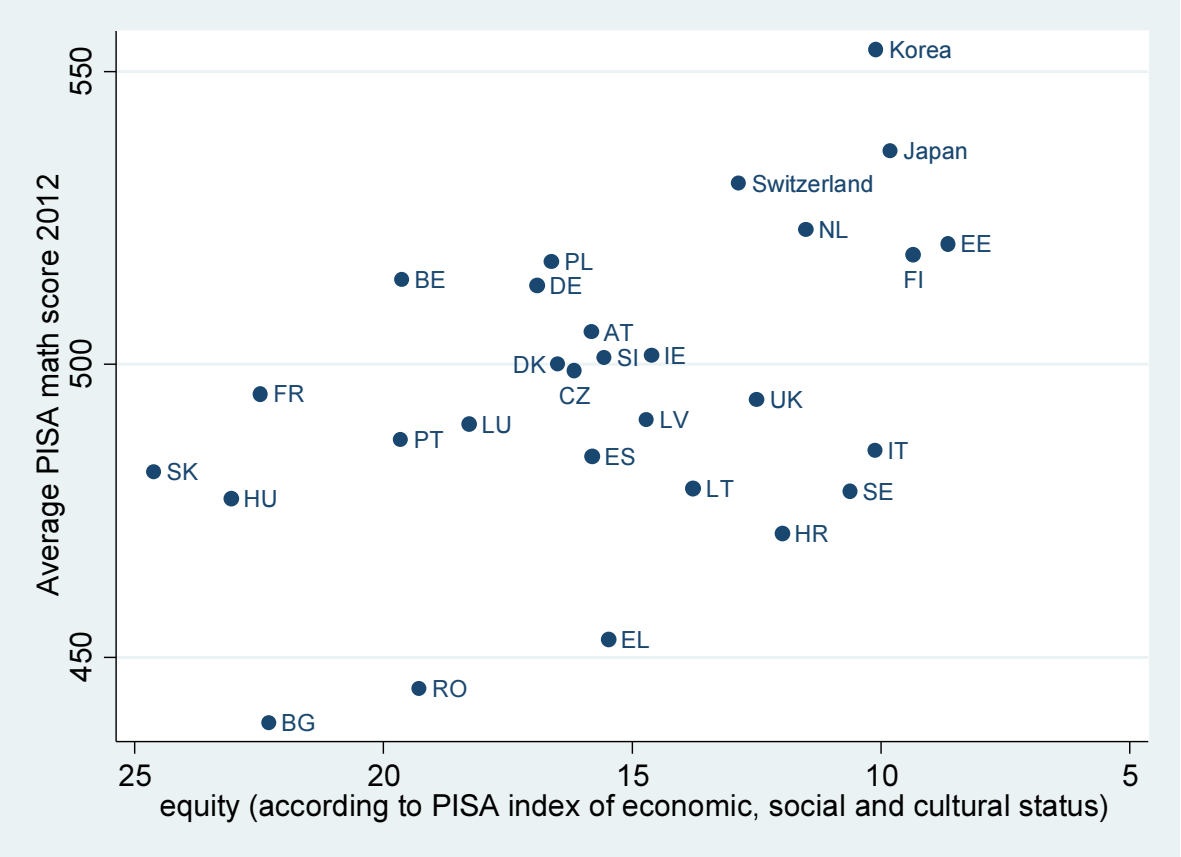
3.3 Primary and secondary education

3.3.1 Equity and educational performance

> "Fifty years later, our generation's Sputnik moment is back. With billions of people in India and China suddenly plunged into the world economy, nations with the most educated workers will prevail."
>
> *US-President Barack Obama, commenting on PISA 2009 results* (Sellar & Lingard, 2013, p. 473).

PISA has shown that EU Member States have different levels of educational inequality. The PISA index of economic, social and cultural status, which the OECD uses for measuring equity in education, in relation with PISA math scores for 2012, indicates that there is a positive correlation between equity and performance. If we include the best-performing OECD countries alongside EU Member States, it becomes evident that the most equitable EU country in the PISA measure (i.e., Estonia) is not far ahead of the top performing OECD countries (see Figure 3). At the same time, Japan and Korea score better than EU Member States and are rather equitable in PISA.

Figure 3 Math scores and equity in the EU and best performing OECD countries



Source: Data by OECD (2014b).
Note: Only EU Member States and OECD countries with higher average PISA math scores 2012 than EU Member States are shown. Equity is larger the closer the equity index is to 0. EU country names are abbreviated (for more information, see 'list of abbreviations and definitions').

How can EU countries improve their performance without reducing equity? The OECD provides advice by stating that the "key factors for effective implementation [of education reforms] include: putting the student and learning at the centre; capacity-building; leadership and coherence; stakeholder engagement; and policy evaluation" (OECD, 2015e). Among these factors, the key importance of teacher quality has come ever more to the forefront with the analysis of recent international test results.

3.3.2 Teacher quality

According to Rivkin, Hanushek, & Kain (2005), the quality of teachers is the most important determinant of students' achievement. Hanushek's (2011) research is often

cited as the best source of evidence that attracting the best to the teaching profession pays off in terms of the accumulation of human capital. He found that the best teachers can enable their students to achieve an additional year's worth of learning compared to the least effective teachers (Hanushek & Luque, 2003). More recent analysis indicates that students from countries at the top of the PISA rankings perform better partly because teachers in countries with the best PISA results have higher numeracy and literacy skills, as measured in PIAAC (Hanushek, Piopiunik, & Wiederhold, 2014). Moreover, "the effect of teacher cognitive skills on student performance is substantially larger for students with low socioeconomic background" (Hanushek et al., 2014, p. 26). Thus, attracting the best to the teaching profession would increase equity.

Recent OECD (2014c, p. 3) analyses also indicate that paying teachers well is part of the equation to achieve excellence: "[s]ystems that pay teachers well tend to perform slightly better in mathematics". Out of 15 EU Member States participating in PISA 2012, in only two there was a non-significant relationship between teachers' salaries and mathematics performance. In the remaining 13 Member States, there was a positive relationship between secondary teachers' salaries and students' achievement in mathematics. Nonetheless, this evidence is limited to secondary school teachers and on calculations based on the average salary of teachers after 15 years of experience.

A different question is whether increasing teacher salaries on the basis of a seniority pay structure is linked to improved student performance. Using data from the US, Hanushek (2003) showed that increasing teachers' salaries on the basis of seniority does not result in better achievement for students. More specifically, Hanushek (2003) has shown that the increase in salary linked to post-graduate training and years of experience of US teachers are "pay parameters" weakly related to students' achievement. In contrast, Dolton & Marcenaro-Gutierrez (2011) recently found that "in 39 countries participating in PISA and TIMSS between 1995 and 2005, a 15% increase in teacher pay increased student performance by between 6% and 8%" (UNESCO, 2014, p. 254).

This evidence indicates that while it is important to consider pay parameters to ensure teacher quality, deciding to raise teachers' salaries without considering other system-level characteristics is not likely to increase efficiency and equity in European educational systems.

Additionally, to ensure teacher quality, TALIS data suggest that other characteristics may be important to raise students' achievement, namely improving teacher training and school working conditions (OECD, 2014c). The European Commission summarises current evidence from TALIS as follows: "[i]n order to ensure that teaching is (perceived as) an attractive career choice policy-makers will want to pay attention to working conditions and salaries, the quality and relevance of Initial Teacher Education, opportunities for professional development and career advancement as well as the availability of tailored support, especially for beginning teachers" (European Commission, 2014c, p. 12).

Teachers become more effective in their first years, but beyond that evidence suggests that their experience and credentials (whether they have a bachelor's or master's degree) do not have a significant impact on student achievement (Schwerdt & Wuppermann, 2011). Again, this evidence was mostly gathered in the US and the TALIS survey shows that in OECD countries two-fifths of teachers say they have never sat in to observe another teacher's lessons or had the chance to give feedback on their peers' teaching practices (European Commission, 2014d). This speaks to the experience teachers have and suggests that collaborative experiences are not the norm in school settings. Yet, collaboration may increase teachers' willingness to try new teaching practices (Costa & Araújo, 2015; European Commission, 2014d). Thus, policies need to be directed at upgrading teachers' knowledge and teaching practices (OECD, 2016c).

Teachers also need to acquire and develop both subject-specific knowledge and pedagogical knowledge. Importantly, the selection of diverse teaching practices during initial training and professional development is amenable to change and influenced by

curriculum options and teaching beliefs. For example, the national curriculum implementation of the Literacy Hour in England had a positive impact on the improvement of students' reading skills in primary school (Machin & McNally, 2008). This intervention affected the learning process by combining different teacher-centred components in the organisation and delivery of reading instruction. Nonetheless, research findings suggest that teaching practices that combine student-initiated activities with teacher-directed practices (such as delivering content in a lecture style) seem to be the most effective for learning (Creemers, Kyriakides, & Antoniou, 2013).

In fact, the effectiveness of different pedagogical practices may vary depending on the activities and content studied. As Falck, Mang, & Wößmann (2015) found for eighth grade students participating in TIMSS, using computers to look up ideas improves maths achievement, but using them to practice skills reduces achievement. Using data from a previous round of the same survey, Schwerdt & Wuppermann (2011) found a positive relation between more lecture style presentation and student achievement. Conversely, working on problems with or without the teacher's guidance was negatively related with students' achievement (Schwerdt & Wuppermann, 2011).

Analyses of PISA data bring additional insights into the effectiveness of problem solving by showing that teachers' use of cognitive activation strategies has a positive relation with achievement (Costa & Araújo, 2015; OECD, 2016c). For example, asking students how they solved a problem, to apply what they have learned to different contexts, to reflect on a problem and giving them problems that require thinking for an extended time is related to higher scores in PISA 2012 (Costa & Araújo, 2015). The OECD (2016c) reports similar results; i.e., higher achievement for students who reported greater exposure to cognitive activation in PISA 2012. In contrast, students who perform at lower proficiency levels tend to report that their teachers engage more in teacher-directed instruction. Establishing cause and effect relationships associated with these findings is, however, difficult. It could be that teachers use more teacher-directed methods with low achievers and more cognitive activation strategies with students who have better mathematics skills. If this is the case, then using teacher-directed practices with low achievers can contribute to reduce the achievement gap between high and low achievers and thus increase equity. Nonetheless, overgeneralizations about prevalent teaching practices with all students and with specific groups of students within a country or across countries should be avoided. For instance, students from high performing East Asian countries that value memorization reported being frequently engaged in independent small group work in the PISA student questionnaire (OECD, 2016c).

Thus, while the research reviewed suggests that a balance between teacher-centred and student-centred practices might be more effective (Slavin, Lake, & Groff, 2009), more evidence is needed to know what makes an effective teacher. Moreover, findings that a particular teaching practice did not have positive effects might be an indication that it was not properly implemented rather than an indication of its lack of effectiveness (Schwerdt & Wuppermann, 2011).

3.3.3 School choice

Another important factor that is related to equity issues is school choice. School choice may increase competition among schools and thus ultimately lead to better performance of students. Nonetheless, school choice can also contribute to aggravate school segregation and can increase the concentration of disadvantaged students in some schools, as disadvantaged families are less able to evaluate the information to select a school of their choice and also due to the fact that some schools select the best students. Thus, the research evidence for school choice is contradictory as it may reduce equity or can result in greater sorting and segregation of students.

On the one hand, a part of the literature shows that the existing educational systems are very ethnically and economically segregated and introducing choice of schools can

contribute to the integration of disadvantaged students, decreasing segregation by increasing mobility (Nechyba, 2000). This can lead to a better distribution of students across schools in terms of social composition as well as contributing to students' integration in their neighbourhoods (Montes & Rubalcaba, 2014; Nechyba, 2000). Increasing school choice opportunities allows disadvantaged and low performing students to opt for higher quality schools, being a way to institutionalise and formalise an arrangement that was the privilege of only a few (Musset, 2012). Wößmann (2008) shows that there are positive effects of school choice on students' performance. In particular, a well-designed voucher system can improve equity, especially for poor families. Hanushek & Wößmann (2012) also find that school choice, as measured by the share of privately operated schools in a system, is positively associated with students' achievement in OECD countries. Additionally, there are factors, other than students' achievement, that can be related to parents' preferences regarding school choice. Data from PISA 2012 show that parents who have the possibility of choosing the schools for their children are more likely to consider the safety of the school environment and the reputation of the school than the students' academic achievement in the school (OECD, 2013c). Burgess, Greaves, Vignoles, & Wilson (2015) find that parents also value a school's socio-economic composition and the distance from home in their decision to choose a school.

On the other hand, evidence from PISA 2012 with cross-country comparisons shows that school choice does not always improve students' learning outcomes and may compromise equity (OECD, 2013b). School choice has increased across OECD countries during the last years (Musset, 2012; OECD, 2014b). However, a school choice programme that is not well designed can generate inequities and segregation across education systems. Schools can have admission criteria in order to select the students who are easier to teach to and with higher learning ability (Lubienski, 2006; Van Zanten, 2009, cited in OECD, 2012). Additionally, students from disadvantaged families have the tendency to attend schools in their neighbourhoods and these students and their parents are less likely to exercise school choice. In general, disadvantaged families are less educated and have more difficulties in evaluating the information related to school choice. On the other hand, families with higher socio-economic resources tend to choose schools without a high percentage of disadvantaged students and also prefer schools with ethnically similar students. Thus, school choice can increase segregation of students by ability, ethnic and socio-economic background (Musset, 2012). For disadvantaged students it can be an advantage if the students and their parents have adequate information and they can choose the schools based on academic criteria. In this sense, school choice should be accompanied by information provided to students and parents and have regulatory and financial frameworks that can boost socio-economic integration.

There are several options for policy reforms regarding school choice:

- controlled choice schemes;
- incentives for schools to make disadvantaged students attractive also to high quality schools;
- financial support to students and their parents by providing vouchers and scholarships that can be spent on the preferred public or private schools.

First, a policy that can contribute to reduce segregation of disadvantaged families is to give these families access to information about schools and to support them in making choices (Hastings, Kane, & Staiger, 2005). Especially for parents whose children attend low performing schools it is important to increase information about alternative schools and use targeted strategies to help them exercise choice. In the last years, some system-level policies have been adopted in order to promote equity in schools, namely in the United States and the Czech Republic. In one school district of the United States, a policy requiring that all students choose a school without taking in consideration race or ethnicity was implemented. A group of volunteers went door-to-door to inform families living in disadvantaged communities (low income and non-English speaking) of their

options. Additionally, information in shopping malls was provided. Godwin, Leland, Baxter, & Southworth (2006) find that as a result of these actions more than 95% of the families submitted the school choice form. In addition, in the Czech Republic there has been a reform in primary and secondary educational levels called "School counselling centres" aiming at managing school choice, to strengthen support to students and help them decide their educational pathway. This reform is a part of the Education for Competitiveness Operational Programme 2007-2013 (OECD, 2015e). Unfortunately, at the moment no evaluation of the impact of this policy reform is available.

The OECD (2012) indicates that more information about schools should be given to the parents, including strengths and weaknesses of alternative schools, dates and enrolment procedures of schools. In addition, OECD (2012) advises that in what concerns information about schools' performance, this indicator should be accompanied by other supporting measures as, for example, school quality attributes that measure the actual contribution of the schools to student outcomes (Burgess et al., 2015; OECD, 2008).

Second, controlled choice programmes or flexible enrolment plans consist of student allocation schemes that provide parental choice. These schemes aim at ensuring that students are distributed in schools with diversity (e.g. in terms of socio-economic status and ethnicity). This policy requires that an educational system has a certain degree of centralisation (OECD, 2012). For example, in 2007 the Netherlands created the "National Knowledge Centre for Mixed schools" with the scope of producing knowledge and influencing work on school choice by providing procedures for school choice and informing parents about it. In 2009 there was also an agreement in Nijmegen (NL) according to which each primary school has to reach 30% of disadvantaged students. A central subscription system was developed that defines a balanced distribution of students. In case of oversubscription, a set of priorities was agreed in order to select the students with the required balance. For example, in Rotterdam there is a double waiting list from which, in the event of oversubscription, schools can select students to enrich their diversity. Nonetheless, Ladd, Fiske, & Ruijs (2009) show that even though a number of efforts have been initiated to reduce segregation, especially in the largest cities, these efforts have thus far shown little success. Furthermore, in Spain there is free school choice and in case of oversubscription or latecomers there are criteria to be followed. One of these criteria is related to the annual family income. Moreover, there is also an option of regional authorities establishing quotas of students in order to preserve a balanced distribution. However, there is no evidence of any assessment of the impact of these policy interventions in Spain yet.

Third, parents can opt for private schools. In some educational systems these schools receive public funding. For instance, the OECD (2012) finds that in Korea and Finland there are not many differences in students' socio-economic background between private and public schools. In contrast, in Spain and Chile there are high discrepancies in students' socio-economic characteristics. In 2013 and 2014 the United Kingdom also introduced the "School Funding Reform", creating a student-driven funding system that provided more consistency end equivalence in schools' allocations. This reform aims at simplifying the funding system, improving transparency and the quality of educational choices (OECD, 2015e). While the outset seems promising, no impact assessment is available.

Last, there are other reforms that can be pursued in order to enable disadvantaged students to attend high quality schools. The idea is to provide financial incentives to disadvantaged or low performing students using voucher schemes or weighted student funding (called virtual vouchers). The voucher schemes are per-student and the financial support depends of the students' educational needs (Ladd et al., 2009). With this scheme schools tend to attract the students with biggest needs and provide them with adequate resources to their needs, as the amount of the voucher is higher for this kind of students. For example, there has been a voucher system in Sweden since 1990, giving the opportunity to families to choose among public and private schools. The schools that receive public funding have to follow the national curriculum and cannot

impose admittance policies related to students' achievement, race, ethnicity or socio-economic background. The amount per-student is calculated based on the cost that students would have were they attending a school from the municipality. Additional financial support can also be given for extra-ordinary costs. Research results on the impact of the vouchers system in Sweden show that there is a slight positive association with students' achievement. However, this relationship is insignificant for students with an immigrant background or whose parents have a low educational level (Böhlmark & Lindahl, 2007). Some authors also argue that this system has resulted in higher segregation in schools (Nicaise, Esping-Andersen, Pont, & Tunstall, 2005).

Weighted student funding schemes have also been implemented in the Netherlands and in Chile (OECD, 2012). In the Netherlands this financial incentive was adopted in 1985 for all primary schools. The "weight" of each student is calculated based on the parents' educational level. Research conducted on this policy reform indicates that schools with a high proportion of these ""weighted" students had an increase in resources, i.e. in the number of teachers per student and more assistant teachers, administrative personal and caretakers (Ladd et al., 2009). In Chile a weighted voucher system was introduced in 2008 aiming at providing additional financial resources to students from low socio-economic status and to schools with a higher percentage of disadvantaged students. There is also a quality assurance system for students and schools that are interested in accepting this financial support. An analysis of the impact of weighted student funding schemes suggests that it can either mitigate or exacerbate the stratifying effects of educational vouchers depending on the type of schools (Elacqua, 2012).

In conclusion, school choice is a very controversial topic. Research to date suggests that it can contribute to reinforce equity across the educational systems, in particular benefiting disadvantaged students, without hindering other students' progress, only when combined with other policies. For example, combining accountability with parental choice can provide students in schools who repeatedly do badly on the accountability test with a voucher to attend private schools. Policies that combine competition, choice and market forces in the school system have been shown to have strong potential to shift a school system to a higher level of efficiency and equity (Berends, Springer, Ballou, & Walberg, 2009).

4 Recent findings in transversal research areas

> "[A]verages without more detailed measures of how indicators are distributed across various subpopulations offer little added value when it comes to understanding the real world."
>
> *Dirk Van Damme (Head of the Innovation and Measuring Progress Division, Directorate for Education and Skills, OECD)* (OECD, 2016d).

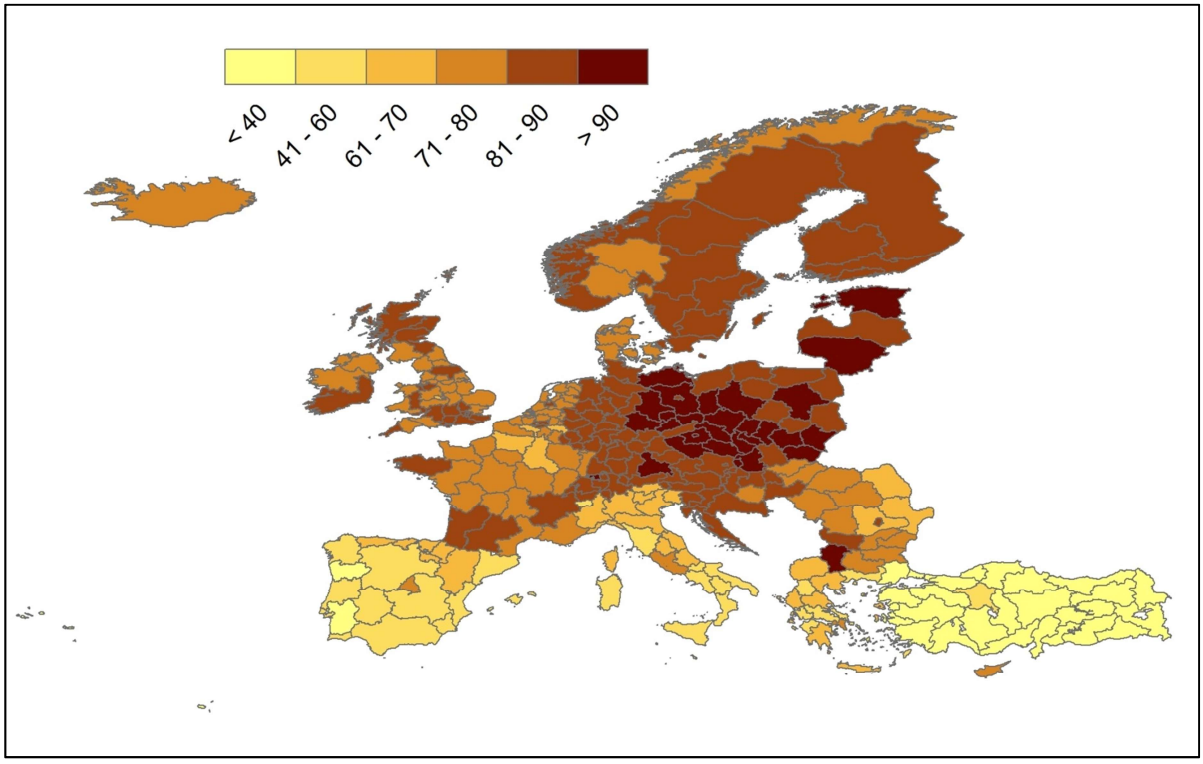
Thus far we have focused on some of the categories of education systems that have been considered by Wößmann and Schütz (2006). Of course, it was impossible for Wößmann and Schütz (2006) to consider all the literature on education in their report. Therefore, we add to their 2006 research in this section by focusing on contributions in a number of other transversal research areas. In particular, we consider the spatial dimension of education by providing information on regional inequalities and further differentiate the population by gender and migration status. This more in-depth look at education and educational policies in the area of equity further sharpens the analysis and the understanding of the causes and results of educational inequities. In this way, this technical brief goes beyond earlier reports and provides further value added for policy makers and researchers.

4.1 Territorial development

Until recently, spatial and regional inequalities were not a major research area in international organisations (see OECD, 2016d). However, as the OECD points out, "exploring subnational variations raises doubts about the meaningfulness of national averages in international statistics" (OECD, 2016d). Indeed, the educational differences within European countries are in many cases larger than between them in both the past and the present – and can often be seen as a key factor driving regional economic differences (e.g., Ballas, Dorling, & Hennig, 2014; Blanden & McNally, 2015; Gennaioli, La Porta, Lopez-de-Silanes, & Shleifer, 2013). For this reason, it is important to consider the subnational, regional or even local level in order to improve equity outcomes. For example, parents' location choices are often deeply influenced by the perceived quality of the neighbourhood, work travel time and distance and quality of nearest school. The result is often local educational segregation (e.g., see Gordon & Monastiriotis, 2007), creating a hurdle for more equitable school outcomes.

Regional differences have been prominent for probably all of history. Already in 1900, major regional inequalities in literacy scores appear in many contemporaneous European countries, such as Austria, Hungary, Italy, Russia and Spain (Hippe, 2013). Today, these regional inequalities are different but still pronounced among the countries and regions of Europe. While regional European PISA 2012 data are not available for most countries, basic educational attainment (measured by the combined medium and high educational attainment) indicates major differences between East European countries, which have the highest combined medium and high attainment, and countries in Southern Europe with the lowest values (see Figure 4). Still, within countries there are relevant regional variations that would need further policy attention. To improve policy recommendations, it appears particularly important that researchers further investigate educational inequalities by obtaining high quality educational outcome data at the regional level, such as regional PISA or PIAAC scores.

Figure 4 Combined medium and high educational attainment, 2014

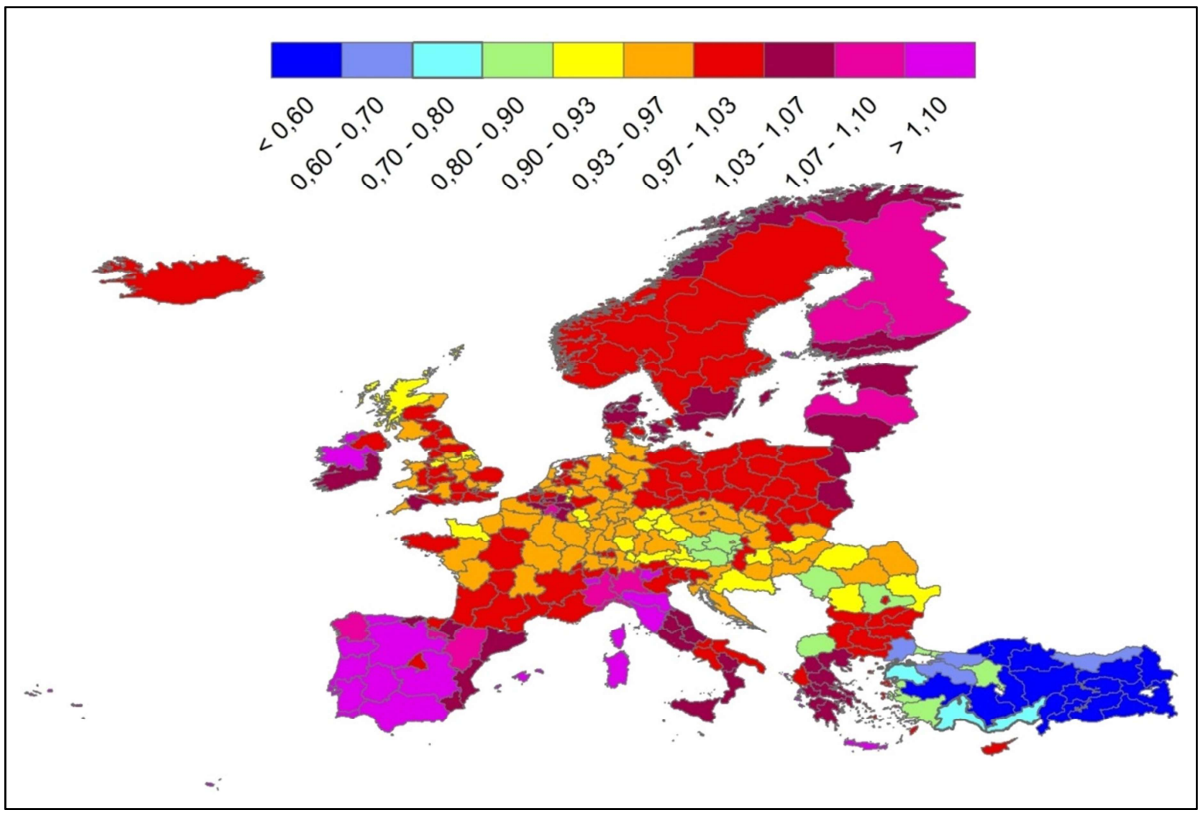


Source: Data by Eurostat (2016a), own analysis.
Note: Combined share (in %) of all ISCED levels 3 and higher, ages 25-64 years.

4.2 Gender inequality

In (probably) all of European history, women had lower educational levels than men. Literacy scores in 1900 also show that the higher the average literacy rate was in a region, the lower was the gender gap (Hippe & Perrin, 2016). This pattern has radically evolved: since about the 1960s, women have outperformed men in educational attainment (see data in Meschi & Scervini, 2014). Today, the female population has lower early leavers' rates in OECD countries (OECD, 2015g), higher average PISA test scores in reading (European Commission, 2013; OECD, 2013d), and, finally, often also higher educational attainment (see Figure 5 for a regional breakdown of the respective gender parity index (GPI) and OECD, 2015b). While these average data are more than impressive, there are still differences below the surface. For example, girls have lower average scores than boys in mathematics (OECD, 2015g), both in total and among high-performers. In addition, girls are less likely to consider a career in science or to be enrolled in technical subjects at university (OECD, 2015g). International comparisons highlight that this is not due to lower ability but rather to cultural values and attitudes (OECD, 2015g).

Figure 5 GPI for combined medium and higher educational attainment, 2014



Source: Data by Eurostat (2016a), own analysis.
Note: Combined share (in %) of all ISCED levels 3 and higher, ages 25-64 years. Gender equality equals 0.97-1.03, whereas < 0.97 means lower female attainment and > 1.03 means higher female attainment. The Gender Parity Index (GPI) is used (see UNESCO, 2011). For example, in Finland, the Baltics and the Iberian Peninsula women have higher attainment than men, whereas the reverse is the case in many parts of e.g., Austria, Romania and Turkey.

Furthermore, educational choices have important implications on fertility behaviour and many related socio-demographic aspects in Europe and elsewhere. For instance, given longer study times, women decide to bear children later – and in a number of cases, not at all (Anderson & Kohler, 2013). In addition, there is a relevant gap between wanted number of children and actually realised family size (Anderson & Kohler, 2013; Testa,

2012). Thus, this might contribute to the already low birth rates that characterize today's ageing societies in Europe.

The other side of the coin is that there are many young men who do not succeed at school or university. There are considerable challenges for their future lives, and policies need to address in particular young men, as they are also the group with the highest crime probability (Loeber & Farrington, 2014). Thus, the reasons for the low performance of some boys need careful further investigation.

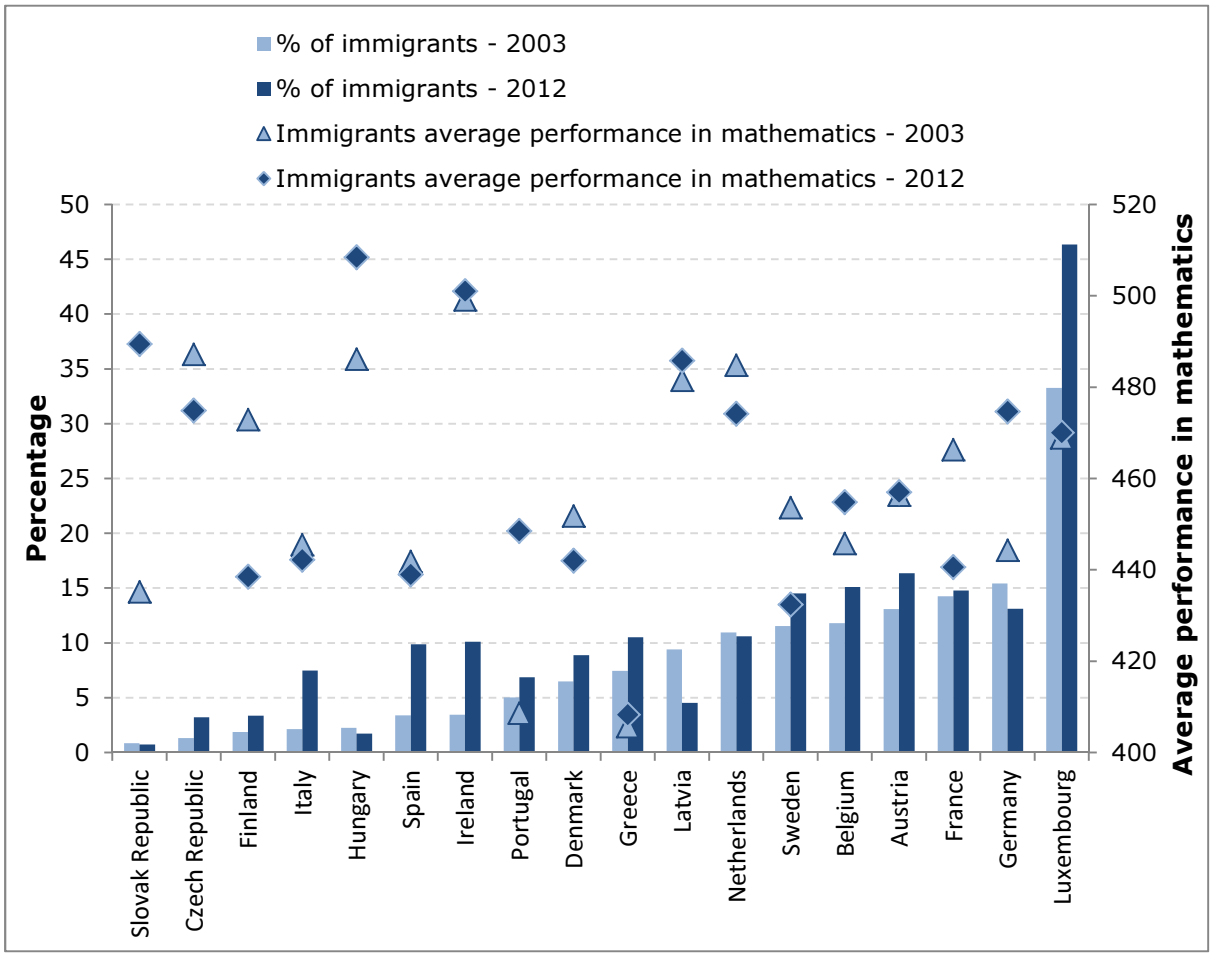
4.3 Immigration

The integration of immigrants across European educational systems is a priority for policymakers in the European Union. In general, the educational achievement of immigrants lags behind that of native students in almost all European countries. In consequence, equal opportunities in education must be provided by public policies in order to offer immigrants a successful long-term integration and thus increase equity.

The performance of 15-year-olds in PISA assessments gives an indication of how school systems are performing and improving in terms of both equity and quality (OECD, 2015e). In particular, these data can give policy makers and educators a way to identify the most effective education policies regarding the integration of young immigrants.

Figure 6 shows the share of immigrants participating in PISA 2003 and in PISA 2012 as well as the average performance in mathematics in both cycles of the PISA survey. Students with an immigrant background are students whose parents were born in a country/economy other than the country/economy of assessment. The share of 15-years-old students participating in PISA who are immigrants grew between 2003 and 2012 in 13 EU Member States (Czech Republic, Finland, Italy, Spain, Ireland, Portugal, Denmark, Greece, Sweden, Belgium, Austria, France and Luxembourg). This share grew by around 2 percentage points in the Czech Republic, Finland and Portugal and by around 7% in Spain and Ireland.

Figure 6 Share of immigrants and math performance in PISA, 2003 and 2012



Source: OECD (2013a); PISA 2012 data, own analysis.
Note: EU Member States with comparable data from PISA 2003 and PISA 2012 are shown. Poland was excluded due to a null percentage of immigrant students in PISA 2003. Countries are ranked in ascending order of the percentage of immigrant students in 2003.

The average performance in mathematics for immigrant students increased between 2003 and 2012 in 9 EU Member States (Slovak Republic, Spain, Ireland, Portugal, Greece, Latvia, Belgium, Austria, Germany and Luxembourg). The highest increase was in the Slovak Republic (54 score points) and Portugal (40 score points). On the other hand, in the Czech Republic, Finland, Italy, Spain, Denmark, Greece, The Netherlands, Sweden and France there was a deterioration of immigrant students' mathematics scores from 2003 to 2012. The highest reduction in immigrant students' scores is found in Finland (34 score points). However, the figure also shows that there is no clear association between the share of immigrant students and student performance. For example, in Luxembourg the share of immigrants in both cycles of PISA is the highest of all countries, but it is not associated to the lowest average of students' mathematics performance. In contrast, in Italy the share of immigrant students is much lower than in Luxembourg, but the students' scores are much lower than the scores in Luxembourg.[6]

[6] A comparison between average immigrants' and natives' mathematics scores (OECD, 2015b) shows that natives outperform immigrants in most countries, in particular in Denmark, France, Belgium and Finland. There is no statistically significant difference between both groups in Slovakia, Ireland and Latvia, while immigrants have higher scores than natives in Hungary. Comparing 2003 to 2012 results indicates that there have mostly been either no statistically

The differences found in this PISA analysis might be due to the fact that the graph does not differentiate between the socio-economic/parental background characteristics of the immigrant students (e.g. educational level, occupational level), or the students' country of origin[7] and does not include information if the student is from a European/OECD or a non-European/non-OECD country. In most EU Member States immigrant students come from less favourable backgrounds as their parents have, in general, lower levels of education than native individuals. In fact, evidence shows that what is more strongly associated to students' performance is their socio-economic status or their family background rather than their immigrant background (Blanden & McNally, 2015; Dustmann, Frattini, & Lanzara, 2012; Schnepf, 2007). Specifically, the OECD (2015e) findings suggest that students from low socio-economic background tend to have a greater probability of being low performers in mathematics than the students from immigrant backgrounds. Clearly, it should be a priority for policy makers to support and raise achievement of low performing students, namely, students with socio-economically disadvantaged backgrounds, immigrant students and students from diverse ethnic minorities in order to reduce the impact of socio-economic background on education outcomes.

Another factor that influences school performance is how long immigrant students have resided in the host country. Nonetheless, studies indicate that native students outperform immigrants even for the ones that arrived in the host country during their childhood (Dustmann & Theodoropoulos, 2010; Murat, 2011; OECD & European Union, 2015). In addition, there is also evidence of the high relevance of host country language knowledge together with family background as influencing the immigrant-native gaps in many countries (Dustmann et al., 2012). Specifically, language knowledge can help to reduce the immigrant-native educational gap.

In what regards the influence of early tracking on students' achievement, Hanushek & Wößmann (2006) show that, in general, early tracking[8] of students in secondary schools based on their academic skills increases educational inequality. This in in line with a recent study from Jakubowski & Pokropek (2015) that finds that while an early tracking policy might not be harmful for the best students, it can lower the performance development of the weakest students, such as immigrants. There is also evidence that tracking at later stages does not always reduce score gaps between immigrant and native students, although it can contribute to improve educational opportunities of students lacking proficiency in the language of instruction (Ruhose & Schwerdt, 2016). In addition, in some EU Member States early tracking systems are viewed as an obstacle for the integration of immigrants as, in general, the selection into tracks occurs before children acquire skills of the host country language (De Paola & Brunello, 2016; Lüdemann & Schwerdt, 2010). Consequently, Ruhose & Schwerdt (2016) suggest that action must be taken to improve the educational opportunities of children from less integrated families calling for a more comprehensive school system that contributes to the integration of immigrant students.

The recent literature has also pointed out the importance of class and school composition in fostering immigrants' integration. Having a high share of immigrants in the class or school has a negative effect on immigrants' performance[9] (De Paola & Brunello, 2016). Tonello (2015) shows that this is the case only for relatively high shares of students with

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significant changes in this gap or the gap has become smaller, the exception being Italy with a larger gap in 2012.

[7] For example, Giannelli & Rapallini (2015) find that immigrant students coming from countries of origin with high PISA Mathematics scores perform better.

[8] Tracking in this context is the differentiation of school curricula into vocational and academic tracks.

[9] Schneeweis (2015) shows that, in terms of grade repetition and track attendance of students with an immigrant background, there is a negative association with high share of immigrants, particularly for students of the same ethnic group.

immigrant background. These results indicate that introducing a limit in the share of immigrant students in the classroom is a supportive policy that might reduce immigrants' educational gap. In Denmark and Belgium policies of this type have been introduced (De Paola & Brunello, 2016). Additionally, retaining and attracting more advantaged students in schools that also host immigrant students could be a supportive policy to improve immigrants' educational opportunities (OECD, 2015f).

Regarding the school curriculum, Costa & Araújo's (2012) analyses of the differential achievement of immigrant students versus native students in PISA 2009 show that immigrant students perform better in reading in test items that mirror educational situations or in contexts where reading serves the purpose of learning or acquiring information. Moreover, they perform better than native students in test items linked to occupational reading or reading that involves accomplishing a task such as looking for a job in a newspaper or to following directions in the workplace. Conversely, native students perform better in personal and public situations that imply reading for recreational purposes as well as attending public events (e.g. a concert). Furthermore, immigrant students perform better in the exposition and instruction types of text, which again are text types likely found in textbooks used in school. These findings suggest that schooling, and specifically the school curriculum, matters for the situation of "reading to learn" that typically occurs in school. Studies of this kind can help decide how schools can help immigrant students transfer their knowledge to reading situations that are more unfamiliar to immigrant students to ensure educational achievement for all students.

The literature also reveals that free pre-school programmes for immigrants and the recruitment of teachers with an immigrant background can help to increase equity for students with an immigrant background (De Paola & Brunello, 2016).

Research in Canada and the US further suggests that "incentive-based educational reforms, such as providing educational subsidies to reduce the costs of secondary and post-secondary education" (Liu, 2014, p. 2), are effective for increasing overall educational attainment of children of second generation immigrants and children of natives. On the other hand, immigration policies designed to admit only highly educated individuals have modest effects on educational attainment of second generation immigrants.

Several system-level reforms have also been adopted to design more inclusive education systems, through structural changes to education systems or more targeted approaches, such as reducing grade repetition, providing school choice or raising the age of early tracking.

Table 2 below shows that some EU Member States, like Finland, Ireland, Germany and Slovenia, have recently implemented educational reforms, strategies or policies aimed at providing equal opportunities in education for disadvantaged students. In particular, in Finland, Ireland and Germany the implementation of educational strategies might be due to the increase of the share of immigrants. These countries are confronted with the need to carry out targeted efforts to increase the educational opportunities of immigrant students. More specifically, the table shows that some Member States have introduced reforms to increase the participation of immigrant students in education (e.g. Finland, Germany, Slovenia) and implemented programmes supporting language knowledge (e.g. Finland, Ireland). In Slovenia there has been a reform aiming at encouraging parents' participation in school activities and also one aiming at promoting interculturalism in schools. In Finland the curriculum is differentiated according to students' characteristics. Some Member States have also implemented reforms related with teachers' quality and practices (e.g. Slovenia).

Table 2 Immigration policies in EU Member States, 2008-2016

Country	Policy name	Description
Finland	National Core Curriculum for	In 2009, Finland introduced a reform to support

	Instruction Preparing Immigrants for Basic Education	students with immigration background who are not proficient in Finnish or Swedish. The curriculum is differentiated according to students' age, learning abilities and background.
	Education and Research	A plan to increase the participation of students with immigrant background in preparatory education between 2011 and 2016 with the aim of improving their opportunity to be enrolled in upper secondary education. In particular, in 2014 one year of preparatory education was created for students to integrate general upper secondary education.
	The Action Programme for Equal Opportunity in Education	The reform was initiated in 2013 and aimed at improving the situation of disadvantaged groups at all levels of education.
	---	The national core curricula for VET implemented in Finland includes educational arrangements for immigrants.
Ireland	Intercultural Education Strategy	Between 2010 and 2015, Ireland implemented a reform aiming at promoting "inclusive and intercultural learning environments for migrant students by developing leadership and teaching quality, instructional language knowledge, mainstreaming, rights and responsibilities and setting high expectations, among other features" (OECD, 2015a, p. 54).
Germany	National Action Plan on Integration (NAP-I)	In 2011, in Germany there was plan that "sets goals in education, training and continued education to increase the participation and success of students from immigrant backgrounds" (OECD, 2015a, p. 54).
Slovenia	Liven Up the School Initiative (Popestrimo šolo, 2011) Program of Education for Professionals' Skills Improvement for successful Integration of Immigrants Students in Education (2013)	In Slovenia several programmes were instituted to support low-performing students and schools targeting mainly students from disadvantaged socio-economic, immigrant or Roma backgrounds in primary and secondary education.
	Measures and Guidelines for the integration of immigrant children in kindergartens and schools (2009 and 2012)	Strategy implemented in 2009 and amended in 2012 aiming at supporting children before the start of school and during their education. The support includes parents' encouragement in participating in school activities and also supporting schools in planning education.
	Project raising the social and cultural capital in areas inhabited by members of Roma Community	Project implemented between 2011 and 2013. This project aims at increasing the participation and success of Roma students by introducing specific methods of work with these students.
	Projects for the Successful Integration of Roma Students in Schools	Between 2008 and 2016, Slovenia implemented a programme to share best practices of inclusive teaching among kindergartens and schools and teachers in areas with little or no such experience. Specifically, between 2013 and 2015, this programme provides educational activities for immigrant students and training for teaching staff to promote interculturalism in schools. Results of this project carried out "by the end of 2010 included higher attendance of Roma children in

		educational institutions, improved co-operation between Roma parents and educational institutions, increased awareness among Roma of the importance of learning and education, and more successful co-operation between teaching assistants, teachers and Roma parents in the education of Roma children" (OECD, 2016b, p. 8)

Source: CESIFO-DICE (2015); OECD (2015d, 2015e, 2016b).

In addition to the reforms undertaken by some individual EU Member States, the European Commission (2015) recommends policies that might be valuable for immigrant children who do not speak the language of the host country at home. Namely, providing the school with extra funding for helping students learning the host language; training teachers to deal with students lacking competencies in the national language; preparing teachers to work in multilingual classrooms; and supporting out-of-school activities and parental involvement. Moreover, the OECD (2015f) proposes some other reforms aimed at helping immigrants succeed in school. Specifically, reducing or eliminating ability grouping, training teachers in formative assessment to identify students who need language training, and offering incentives for teachers and school leaders to work in disadvantaged schools. Other proposed related initiatives include integrating language and subject learning from the earliest grades, providing information to immigrant families on schooling options, and limiting the extent to which advantaged schools can select students based on socio-economic status.

In sum, the evidence shows that there are many factors influencing immigrants' integration and that, while some may be common across Member States, others are country specific. For example, the EENEE report entitled "Education as a tool for the economic integration of migrants" calls attention to the fact that system-level policies that encourage quality and equity may have to vary across countries (De Paola & Brunello, 2016).

5 Conclusion

This technical brief has offered an overview of the latest developments in the area of equity in education in Europe. Taking the 2006 EENEE report (Wößmann & Schütz, 2006) on equity and efficiency in education as a starting point, we have outlined the various research and policy developments in this area.

More specifically, this brief has considered the various stages of basic education, that is, early childhood education and care, primary and secondary education. It has focused on a range of particularly important topics that have emerged during the last years, such as the importance of providing quality teachers in schools. Furthermore, we have included a number of relevant transversal research areas which provide further value added by allowing a more in-depth view of the topics treated in the previous sections. More specifically, we have considered equity in education in a regional perspective, and explicitly (but briefly) emphasised the sub-populations concerned by equity measures (i.e., gender issues and immigrants).

The main results of this brief can be summarised as follows. First, European policy makers have been very active in the educational field, as there have been hundreds of educational reforms during the last decade. Second, ensuring the quality of early childhood programmes should now be the education priority in what concerns ECEC. Furthermore, it has been stressed that home interventions and specific pedagogical practices that include both cognitive and social stimulation can help bridge the gap between more and less advantaged children.

Third, research shows that teachers are one of the most important ingredients to achieve educational excellence and increase equity. Their own skills matter for the

progression of their students, as do teacher scientific and pedagogical training. Such training should be assured during initial training and during subsequent professional development. Effective teachers use diverse teacher-centred and student-centred practices, but there is still much to be learnt about what makes an effective teacher.

Fourth, school choice has been a very controversial topic, because there is no consensus that it always improves students' learning outcomes. In fact, it can also contribute to aggravate school segregation, as disadvantaged families are less able to evaluate the information to select a school of their choice, while some schools select the best students. However, evidence suggests that choice can contribute to reinforce equity across the educational systems when combined with other policies. For instance, combining accountability with parental choice can provide students in schools that repeatedly do badly with a voucher to attend private schools. Policies that jointly introduce competition, choice and market forces into the school system have been shown to have strong potential to shift school systems to a higher level of efficiency and equity. However, the results of school choice depend heavily on the specific contextual design, institutional framework and implementation.

Fifth, there are significant regional and gender differences in European countries. In contrast to previous history, girls have now generally full and equitable access to education, and outperform boys in many educational areas. These educational gaps have important implications for e.g., the ageing society and (un)employment patterns and deserve more policy attention in the future. Furthermore, we have reviewed the role of education in fostering immigrants' integration across European educational systems. In general, in Europe, immigrant students have on average lower educational attainment when compared to native students and actions must be taken to increase equity. However, there is a large heterogeneity among countries and system-level policies may have to vary across countries. The immigrant-native educational gap is mainly related to differences in socio-economic background and to the lack of knowledge of the host country language. In this sense, policy makers should support and raise achievement of disadvantaged students and implement policies that address immigrant children's lack of knowledge of the host country's language. In addition, other system and school characteristics may also influence educational outcomes of immigrant students, such as pre-school attendance, early tracking and class composition.

Looking ahead, there are a number of persistent challenges for achieving equity in education. Equity in education will remain an important topic in the future, as it is "the most important way in which poverty, social inequality and exclusion are transmitted" (OECD, 2015a, p. 1) across generations. European policy makers have tackled this issue in a number of ways, but still more needs to be done in the future.

In particular, 'one size fits all' policies do not appropriately address the needs of the entire population. Policies have to be tailored to the specific requirements of the local populations – the particular local contexts, institutions and stakeholders have always to be taken into account. Still, giving more priority to early childhood education and care and improving teacher quality in schools are certainly save options to achieve higher equity levels.

While the Wößmann & Schütz' (2006) report notes that data limitations have substantially hindered research, this obstacle has been addressed but not solved. Many question marks remain with regard to data availability in many areas, particularly when considering specific analyses at regional levels within countries.

The life-cycle approach already presented by Wößmann & Schütz (2006) shows that investing in education as early as possible and providing equal support to all children has to be a priority. While the educational system has an important influence on children's education, parents will always be a crucial factor in the upbringing and education of children.

Finally, evaluations and assessments should be conducted to support educational reforms in order to provide results on their implementation and reform success. Measuring policy impact is essential for developing the most useful, practicable and successful education policy options. Ensuring that such research also influences the actual policy making is an important challenge in this area. The best-informed research is of little use if policy makers do not take it into account in their decisions. Therefore, it has to be a priority to obtain a better connection between evidenced-based research and policy making.

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List of abbreviations and definitions

A. EU country abbreviations

Code	Country name
AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
CZ	The Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
EL	Greece
ES	Spain
FI	Finland
FR	France
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
NL	The Netherlands
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
UK	United Kingdom

B. Other abbreviations

Abbreviation	Description
ALL	Adult Literacy and Lifeskills Survey
CEHD	Center for the Economics of Human Development
EACEA	Education, Audiovisual and Culture Executive Agency
EASO	Evaluation and Assessment to Improve Student Outcomes
ECEC	Early childhood education and care
EENEE	European Expert Network on Economics of Education
EQ	Equity (and Quality)
ESS	European Social Survey
EU	European Union
EU-SILC	European Union Statistics on Income and Living Conditions
FUN	Funding
GOV	Governance
GPI	Gender parity index
IALS	International Adult Literacy Survey
ISCED	International Standard Classification of Education
ISSP	International Social Survey Programme
MS	Member States
NAP-I	National Action Plan on Integration
OECD	Organisation for Economic Co-operation and Development
PIAAC	Programme for the International Assessment of Adult Competencies
PISA	Programme for International Student Assessment
PREP	Preparing Students for the Future
SI	School Improvement
TALIS	Teaching and Learning International Survey
UNESCO	United Nations Educational, Scientific and Cultural Organization
US	United States of America

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