

A person wearing a space helmet and a jacket is looking upwards at a starry sky. A large, dark, cylindrical object is on their back. The scene is set against a dark, starry background.

Challenge #2

# MOVE TO THE FOREFRONT OF EDUCATION



## EXECUTIVE SUMMARY

- Over the last four decades, Spain has led the most spectacular educational revolution in Europe, comparable only to that carried out by Finland over the same period. As a result, our country has managed to correct decades of being behind and come closer, in many indicators, to the EU average.
- However, this convergence has been partial and incomplete. Our education system still has major shortcomings that prevent us from realising the full potential of every pupil and have negative effects on employment, economic growth, and social progress throughout the country. The most worrying of these are the high retake and drop-out rates; low learning outcomes; educational inequality; and high levels of school segregation.
- If they are not decisively addressed, these shortcomings will continue to hinder the development of the country and its citizens. Without significant reforms, between now and 2050, 3.4 million pupils could have to retake courses, 2.2 million could drop out of school early, and Spain could be surpassed in learning and educational quality by countries like Portugal, Hungary and Latvia, with implications for international competitiveness and influence.
- Avoiding this scenario must be our top priority. If Spain wants to remain a prosperous country in the future, it will need to be at the forefront of education by the middle of the century.
- To do this, we will need to transform the teaching profession, modernise the curriculum, expand the autonomy of our schools, create an effective evaluation system, strengthen support mechanisms for the most disadvantaged groups, and promote education from 0 to 3 years of age as well as Vocational Training.
- Carrying out these reforms is possible. In fact, most of the improvements that are needed to converge with the most advanced EU countries are similar in nature and magnitude to those already achieved since the transition to democracy or those carried out by several southern and eastern European countries in recent years.
- In addition, demographic and technological changes in the near future could act as a tailwind. In 2050, Spain will have 800,000 fewer pupils between the ages of 3 and 15 than it does now. This will allow us to double spending per pupil to the level of Denmark without incurring a significant increase in public spending. This, together with the massification of digital technologies in our schools and homes, will allow us to provide our pupils with a more personalised education, fight more effectively against phenomena such as dropping out of school early and segregation, and reap the rewards in coverage and learning that we need in order to lead the way in education.



## THE PAST: ACHIEVEMENTS

Education is one of the most important factors in shaping a country's social, economic, and cultural landscape. As such, it is part of the source and solution for most of its challenges, and is one of the main determining factors of long-term economic and social progress [see chapter 1]. The democratic Spain that was born in 1977 inherited an obsolete educational system from the previous regime that was designed to neither guarantee equal opportunities nor prepare young people to be an active part of society.<sup>1</sup> The Spanish Constitution of 1978 radically changed this fact: it established "the right of all [citizens] to free education" and "the freedom of education", guaranteed "the effective participation" of social stakeholders in the educational system, and set as goals "the full development of human personality with due respect for the democratic principles of coexistence and for basic rights and freedoms."<sup>2</sup>

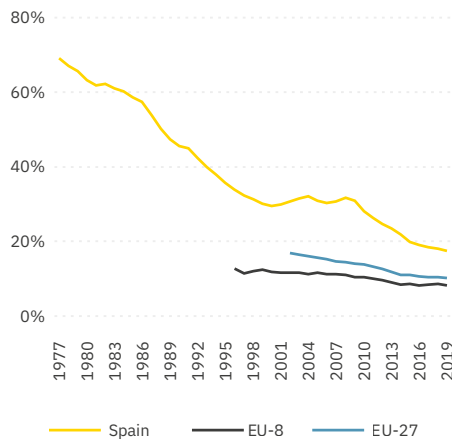
This laid the foundations for what would end up being **one of the most spectacular educational revolutions in the developed world - in many respects, comparable only to that of Finland** during the same period. There have been many achievements. Since 1977, Spain has doubled its public spending on education as a percentage of GDP<sup>3</sup> and has created an extensive and well-equipped network of nursery schools, primary schools and secondary schools.<sup>4</sup> It has also created an institutional framework of decentralised and open government that has given a voice to all social stakeholders (students, teachers, families) and has brought education closer to the realities of each region.<sup>5</sup>

Likewise, the curriculum has been modernised and expanded,<sup>6</sup> incorporating new competencies and including key aspects for development such as civic and environmental culture.<sup>7</sup> Teacher training has been substantially improved;<sup>8</sup> assessment systems have been renewed;<sup>9</sup> and the student/teacher ratio has been reduced to levels similar to those of the most advanced countries in Europe today.<sup>10</sup>

Profound reforms have also been carried out **to increase inclusivity and equity in the system**. In the last four decades, Spain has greatly improved the school integration of people with special educational needs,<sup>11</sup> has expanded the mechanisms of support and reinforcement for students with more difficulties, and has greatly strengthened its system of scholarships and grants, **to the point where the percentage of non-university students who benefit from a scholarship rose from 7% in 1996 to 21% in 2017.**<sup>12</sup> In addition, the country has managed to incorporate more than 800,000 students of foreign origin, 10% of the total at present,<sup>13</sup> at a rate and proportion higher than most of the countries around us.

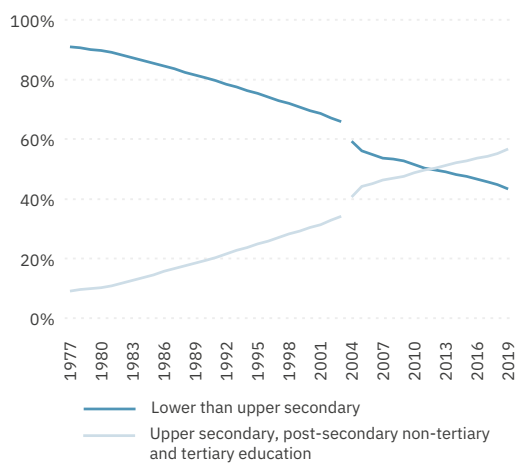
The combination of these and other improvements has resulted in **the effective universal access to primary and lower secondary education, and a dramatic improvement in coverage rates in post-compulsory secondary education**. Between 1977 and 2019, the school drop-out rate has fallen from 70% to 17% [Fig. 1]; the number of students held back a year has been reduced by more than a third;<sup>14</sup> the percentage of adults without formal education has fallen from 10% to less than 2%;<sup>15</sup> and the percentage of citizens with at least upper secondary education has risen from 9% to 57% [Fig. 2].<sup>16</sup>

**Fig. 1. School drop-out rate**



Source: Authors' own, based on Eurostat data and Felgueroso, Gutiérrez-Domènech and Jiménez-Martin.<sup>17</sup>

**Fig. 2. Population by maximum education level reached, Spain**

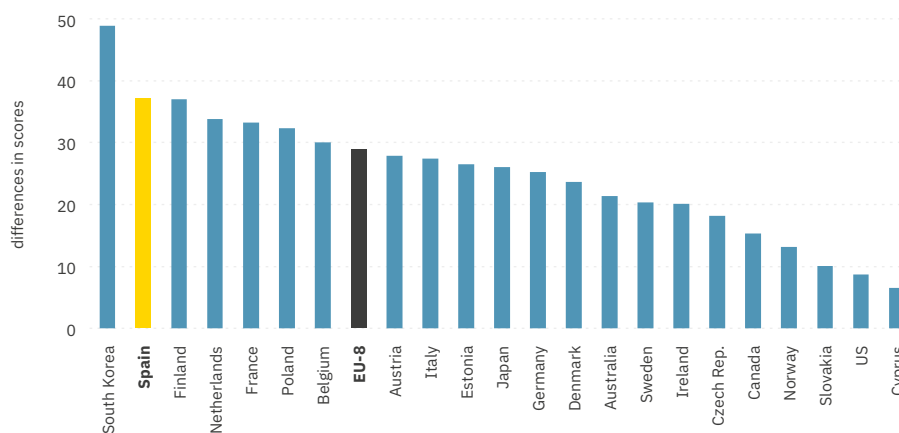


Source: Authors' own, based on De la Fuente and Doménech, and Eurostat data.<sup>18</sup>

**Gains in coverage have also been achieved in the initial phases of educational training.** In 1977, only 6% of 2 year olds in Spain were in school;<sup>19</sup> ; today, more than 60% are.<sup>20</sup> Similarly, schooling between the ages of 3 and 6 has become practically universal.<sup>21</sup> This has been a key advance for two reasons. First, because the improvements in training at these early ages are of major importance in cognitive and vital development.<sup>22</sup> Second, because it has served to facilitate the professional development of thousands of mothers and fathers.<sup>23</sup>

In addition to this major progress in coverage, our education system has made **remarkable progress in terms of learning.** Data from the Programme for the International Assessment of Adult Competencies (PIAAC), suggest that **Spain has, along with South Korea and Finland, been the OECD country that has experienced the largest gains in basic skills** (reading comprehension and mathematical ability) over the last 40 years [Fig. 3]. This has allowed us to correct decades of being behind and to get closer to the OECD and EU-22 average.<sup>24</sup>

**Fig. 3. Differences in reading comprehension between younger people (aged 16-24) and older people (aged 55-65), 2012**

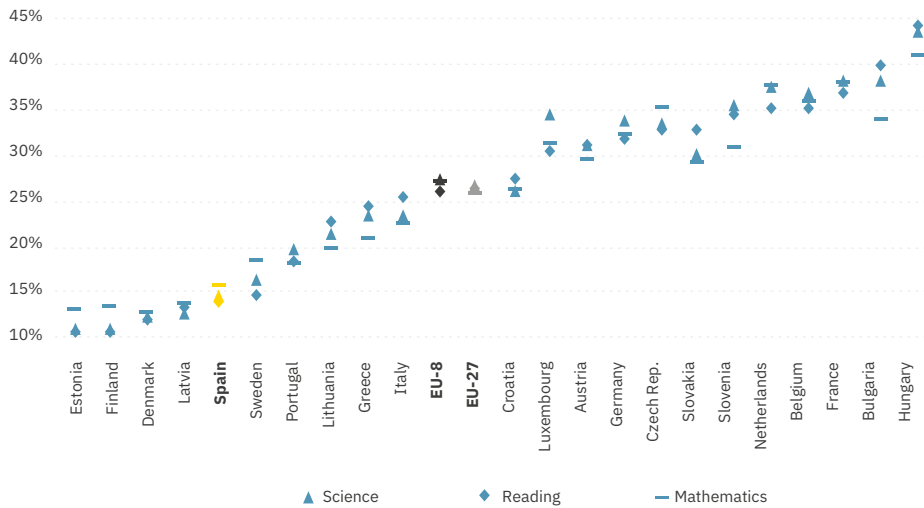


Source: Author's own based on OECD data.<sup>25</sup>



Even more important have been the **gains in terms of equity**. Although there is still work to be done, the data indicate that progress so far has made it possible to reduce the impact of students' social background on their subsequent academic and professional development by more than 30%<sup>26</sup> As a result, **Spain is now one of the EU countries where socio-economic background has the least influence on learning outcomes** [Fig. 4].

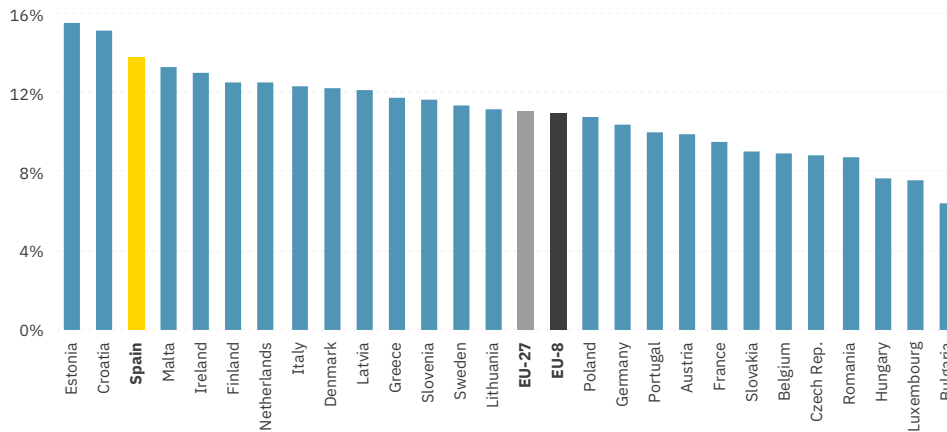
Fig. 4. Variation in academic performance explained by students' socioeconomic status and schools, 2015



Source: Author's own produced from OECD data.<sup>27</sup>

This greater equity is also manifested in improved performance of the most disadvantaged groups and is seen across the country. On the one hand, Spain is ranked 3rd in the EU-27 in terms of total percentage of "resilient students" - that is, those who come from households with a low family income but who achieve good results in the Programme for International Student Assessment (PISA) [Fig. 5]. On the other hand, the data suggest that the education gap between rural and urban areas is one of the smallest in the world.<sup>28</sup>

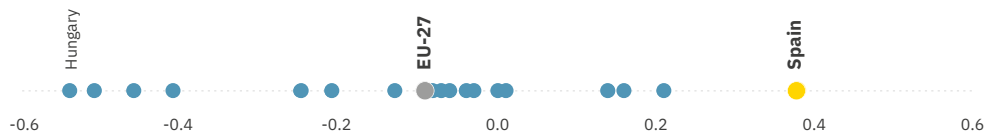
Fig. 5. Percentage of students in disadvantaged situations whose performance is in the highest quartile for reading comprehension in their country



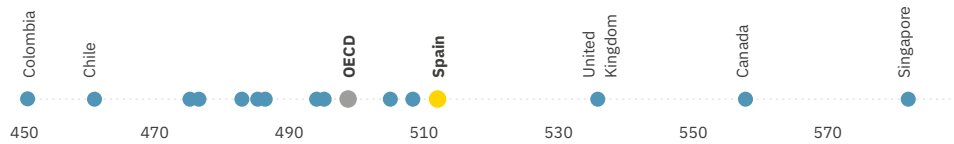
Source: The authors' own, based on data from the OECD and the Department of Education and Vocational Training.<sup>29</sup>

**Progress in terms of freedoms and values has been equally remarkable.** In just 40 years, our country has become 8th among EU countries with the greatest freedom of education, ahead of France, Germany and Sweden,<sup>30</sup> and has achieved one of the highest levels of tolerance [Fig. 6] and commitment to global problems (poverty, war and climate change) [Fig. 7] in Europe. Moreover, Spain is one of the countries with the best school atmosphere and lowest levels of bullying [Fig. 8], which are both fundamental for academic performance and student well-being.

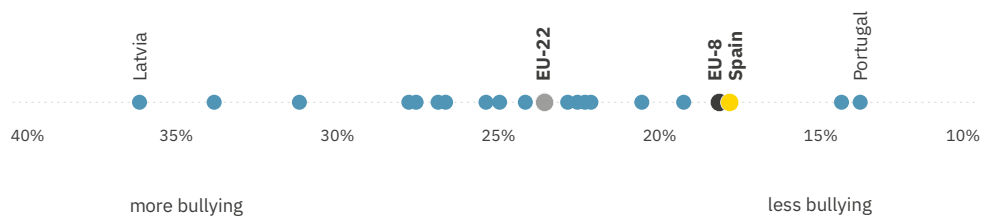
**Fig. 6. Index of student respect for people from other cultures, 2018**



**Fig. 7. Average performance in regard to overall competencies, 2018**



**Fig. 8. Percentage of 15-year-old students who have been bullied, 2018**



Sources: Authors' own, based on data from the OECD and the Department of Education and Vocational Training.<sup>31</sup>



## TODAY: ISSUES TO BE RESOLVED

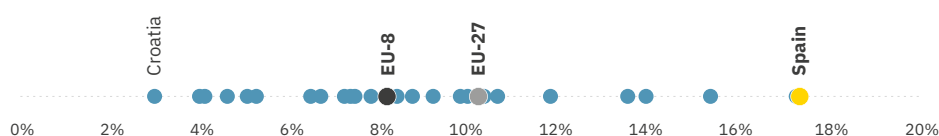
As we have seen, over the last four decades Spain has made great advances in education, some of them so essential and ubiquitous that they are easy to overlook be taken for granted. As a result, the country has recovered much of the lost ground and has succeeded in getting closer, in terms of many of the indicators, to the EU-27 average. **However, this progress has been uneven and incomplete.** Our education system still suffers from significant gaps in coverage and has lower learning outcomes than our European neighbours. As the knowledge society becomes more established, the quality of human capital will become an even more important determiner for country's development. For this reason, it is essential that Spain consolidate the improvements it has achieved in recent decades and extend them in the future. **Our objective must be to become a global leading light in education and converge with the most advanced countries in Europe (EU-8) by 2050**, an aspiration that, as we will see below, is as audacious as it is viable and unavoidable.

To achieve this, **Spain will have to resolve major pending issues in its education system.** Here, we highlight six:

**The first is the high rate of student retaking years.** In Spain, 29% of 15-year-old students have repeated a school year at least once, compared to 11% in the EU-22 and the OECD.<sup>32</sup> This phenomenon has nothing to do with their abilities, but with our system's norms and forms of evaluation. Most scientific research considers that the abusive use of retaking years is an ineffective and inefficient mechanism that does not help either those who retake (it does not usually translate into an improvement in results, but rather into an increase in the probability of dropping out) or the system as a whole (it entails additional expenditure).<sup>33</sup>

**Our second pending issue to be resolved is the persistent levels of students dropping out of school early.** Despite the notable improvements of the last three decades, Spain still has the highest school drop-out rate in Europe [Fig. 9], 7 percentage points above the target of 10% set by the EU for 2020.<sup>34</sup> This high drop-out rate affects the development of our economy and determines the work and life opportunities for thousands of young people<sup>35</sup> who, after leaving school prematurely, are often condemned to unemployment or to precarious and poorly paid jobs for the rest of their lives.<sup>36</sup>

Fig. 9. Early School Drop Out, 2019

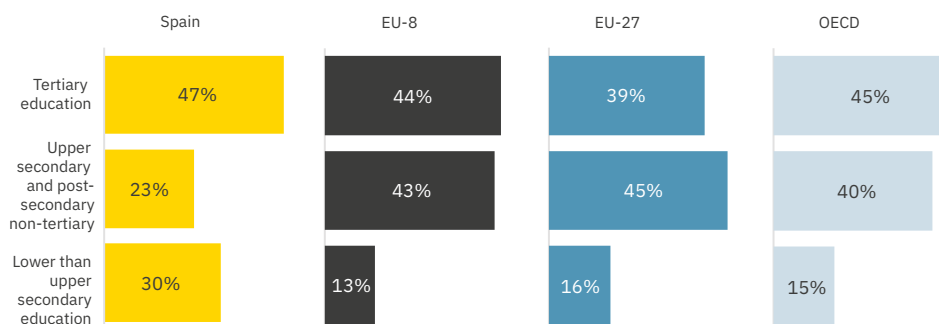


Source: Authors' own, based on Eurostat data.<sup>37</sup>

The high retake and drop-out rates are closely linked to **our third issue to be resolved: insufficient access to post-compulsory studies.** In 2019, the percentage of the population aged 25-34 who had completed compulsory secondary education and were still in education in Spain was 70%, compared to 85% in the EU-27 and the OECD [Fig. 10]. This means that too many citizens leave the system with low levels of education - a shortcoming that we have had for

decades and one that explains why, today, **there are more than 10 million adults<sup>38</sup> (48% of the working population aged 25-64) without an educational qualification that qualifies them for a professional position<sup>39</sup> [see chapter 3].**

**Fig. 10. Population aged 25-34 by level of education, 2019**

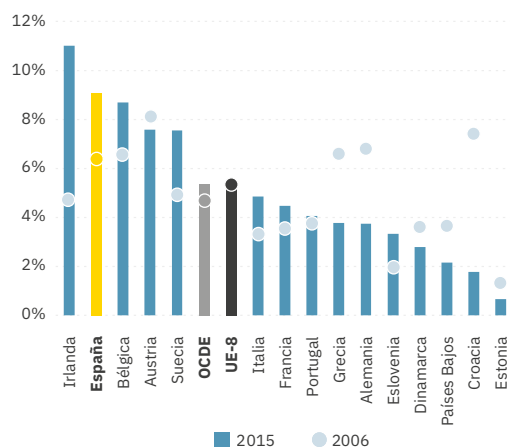


Source: Authors' own, based on Eurostat and OECD data.<sup>40</sup>

**Our fourth issue to be resolved is related to learning levels.** Over the last twenty years, the amount of resources (human, financial and time) that European states and households devote to the education of their children has increased significantly. However, their learning seems to have stagnated or even fallen in most cases, at least as far as basic skills are concerned.

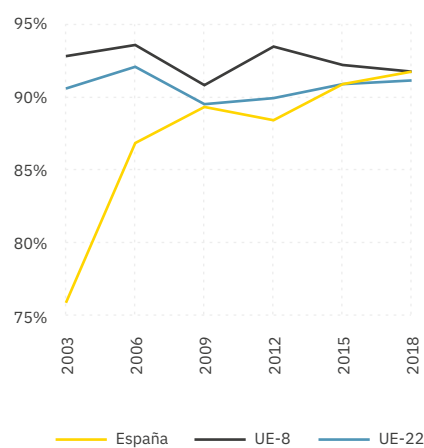
The results obtained in the PISA tests describe a similar stagnation for Spain,<sup>41</sup> although with an important nuance determined by changes in the sample considered. At the beginning of this century, the proportion of young people taking part in the PISA tests was much lower than in other nearby countries - either because many dropped out of school before the age of 15 (when the test is taken) or because they were excluded from taking the test because,<sup>42</sup> for example, they were not native speakers and had not mastered one of the official languages [Fig. 11]. The improvements in access we have described above allowed us to correct this difference and have meant that the population covered by PISA in Spain has increased from 76% in 2003 to 92% in 2018, thus converging with the levels of the EU-22 and the EU-8 [Fig. 12]. This change in the sample means that improvements in learning achieved in recent decades are not well reflected in the evolution of the results.

**Fig. 11. Proportion of students born abroad**



Source: Author's own based on OECD data.<sup>43</sup>

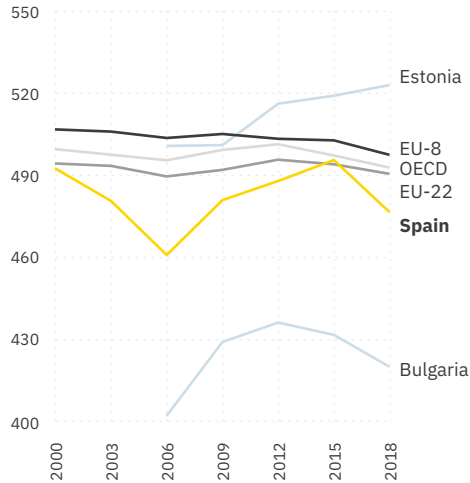
**Fig. 12. Population aged 15 covered by PISA**



Source: Author's own based on OECD data.<sup>44</sup>

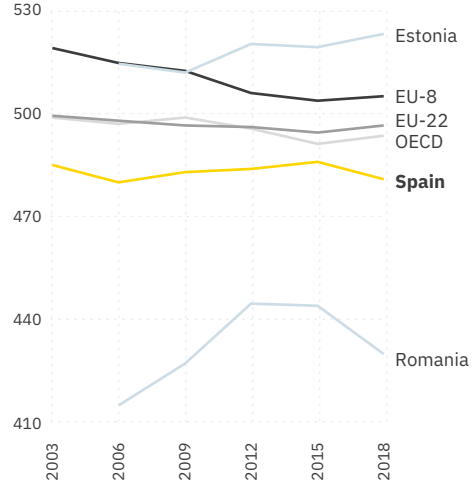
This does not, in any case, change the fact that **Spain still has learning levels significantly below those of the EU-8** [Figs. 13, 14, 15 and 16]; <sup>45</sup>a severe problem that is a determining factor for the country's present and future.

**Fig. 13. PISA results in reading comprehension**



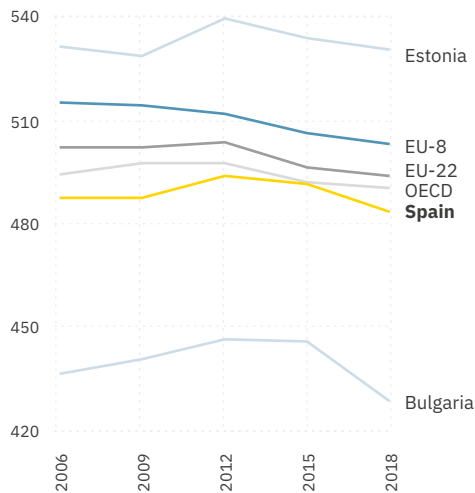
Source: The authors' own, based on OECD and the Department of Education and Vocational Training data.<sup>46</sup>

**Fig. 14. PISA results in mathematics**



Source: Author's own based on OECD data.<sup>47</sup>

**Fig. 15. PISA results in science**



Source: Author's own based on OECD data.<sup>48</sup>

**Fig. 16. Other relevant skills measured by PISA**



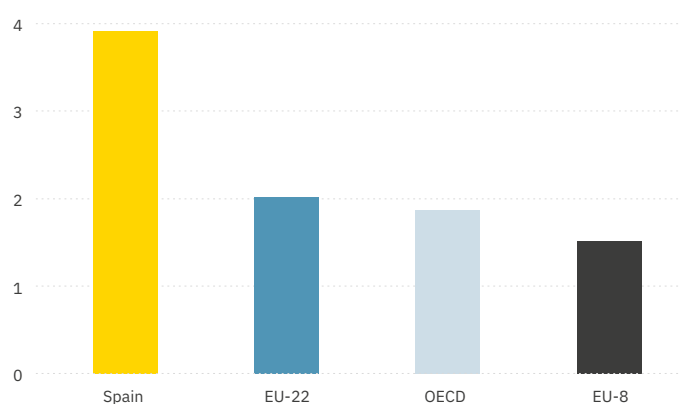
Source: Author's own based on data from the OECD.<sup>49</sup>

**The learning outcomes also indicate a low level of excellence.** The students with the best performance level in Spain are as good as those in Finland, but only 4-7% (depending on the skill assessed) manage to reach this level, compared to the 10-15% that achieve it in the most advanced countries around us.<sup>50</sup>

**The fifth issue to be resolved in the Spanish education system involves making progress in regard to equal opportunities and reducing school segregation.**<sup>51</sup> As we have already seen, in

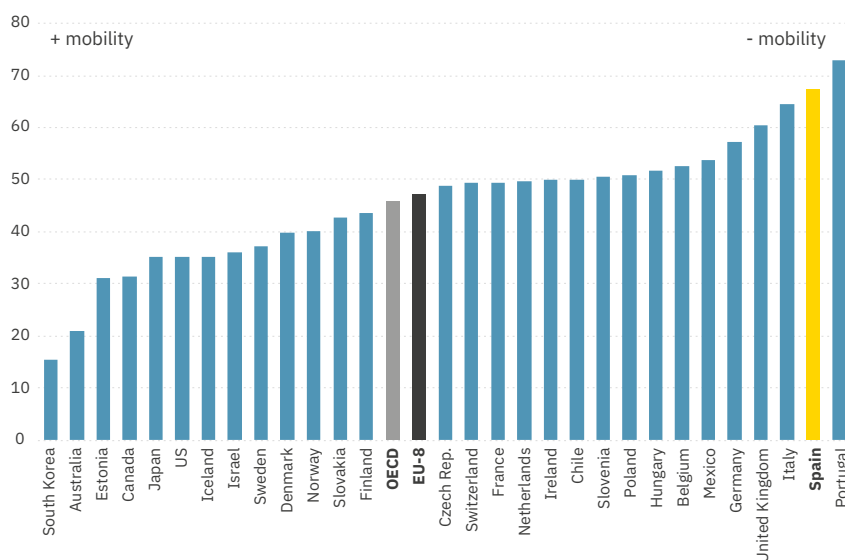
Spain, the socio-economic level of student's home has less influence on their learning than in countries such as France, Italy and the United Kingdom. However, it does have a strong impact on retake and drop-out rates.<sup>52</sup> For example, the data indicate that, with similar mathematics and science skills, those from more disadvantaged backgrounds are four times more likely to have retaken years than those from more advantaged backgrounds, which is double the OECD and EU averages [Fig. 17].<sup>53</sup> Similarly, the probability of dropping out of school early due to socioeconomic background is 5 points higher in Spain than in the EU-22.<sup>54</sup> On the other hand, school segregation in our country exceeds the European average and, in fact, has increased slightly since 2006.<sup>55</sup> The result of all of the above is that many young people from vulnerable backgrounds do not achieve intermediate and higher qualifications that would allow them to opt for quality employment, and also that educational mobility is still low [Fig. 18].

**Fig. 17. Importance of socio-economic differences in probability of retaking years to equal skills, 2018**



Source: Author's own, based on Ferrer.<sup>56</sup>

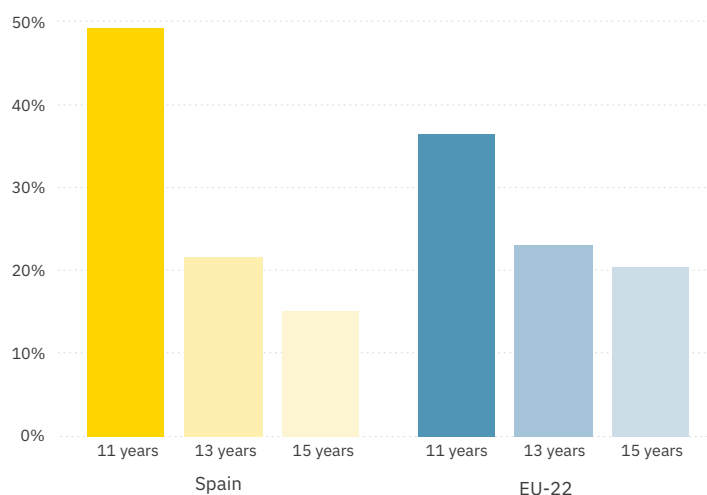
**Fig. 18. Educational mobility (association between parents' and children's educational level), 2018.**



Source: Author's own based on data from the OECD.<sup>57</sup>

**Last, there is the issue of student demotivation.** Spain is one of the countries with the best school atmosphere, the lowest levels of bullying, and the greatest sense of students' belonging to their school.<sup>58</sup> Spaniards begin their schooling with one of the highest levels of "liking school" in Europe. However, this feeling fades rapidly and they finish secondary school with satisfaction levels below those of the EU-22 average [Fig. 19].<sup>59</sup> This progressive disaffection with school is both a cause and a consequence of the problems we have mentioned above - from high drop-out rates to low academic achievement.

**Fig. 19. Students who very much like school, 2014**



Source: Authors' own, based on data from *Health Behaviour in School-aged Children*.<sup>60</sup>

### Routes to improvement

**The weaknesses noted above are due to a host of factors, some of which are exogenous to the education system.** The fact that in our country there is a high level of job insecurity and an abundance of low-skilled jobs (in industries such as construction or hotel and catering) has discouraged people from continuing their studies, especially during the years of strong economic expansion<sup>61</sup> [see chapter 7]. In addition, our high levels of inequality and poverty have made it difficult for many of the educational gains made over the past 40 years to reach the entire population [see chapter 8].

**However, beyond these contextual factors, it is clear that there are things that can and should be improved within the system itself.** Here we highlight five:

## I. The curriculum

Spain has **an excessively rigid and encyclopaedic educational curriculum that is more oriented to reproducing contents (data, formulas, historical facts) than to developing more relevant competencies for life and deep learning.** Our system continues to prioritise (especially in secondary education) instructing "what students should know" as opposed to developing "what students are capable of doing" with the knowledge acquired. Thus, for example, many schools still place greater value on students being able to memorise a list of words in a foreign language than on being able to speak in that language.

In spite of the declared intention of recent educational laws to change towards competence-based learning,<sup>62</sup> the truth is that, in Spain, teaching continues to be organised around an excessive number of subjects, all of which are overloaded with content, constrained by textbooks, and arranged in direct competition with each other for students' attention. This leads to an excessively academic knowledge that is not linked to experience, does not encourage interdisciplinary learning, and hinders or simply ignores the development of fundamental core skills such as teamwork, the ability to construct an argument, assertiveness and critical thinking.<sup>63</sup>

In addition to making it difficult to improve the quality of learning, this curricular style of organisation limits teachers, discourages those who wish to innovate in teaching, and acts as a barrier to equity and excellence, as it can exclude students who have less cultural capital due to failure, retakes, and failure at school, and it can restrict the potential of those who have greater abilities.

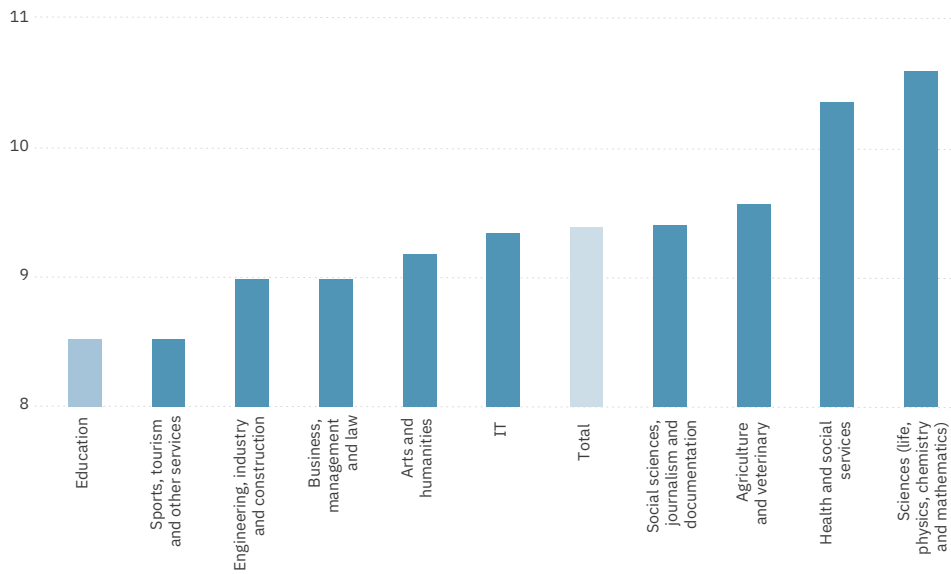
## II. The teaching profession

Teachers are at the heart of any education system and, as such, define much of its potential. In fact, academic research shows that teacher quality is the factor that, along with collaboration and peer learning, has the greatest impact on learning.<sup>64</sup>

Aware of this, Spain has in recent decades implemented a notable improvement in teacher training and performance.<sup>65</sup> Even so, **our system of teacher selection, training and performance evaluation has several shortcomings** that limit our ability to have the best possible professionals in each classroom. This deficit in professional development is something that the teaching community itself recognises and demands.<sup>66</sup>

**The problem starts at the beginning.** For decades, a teaching degree has been one of the least demanding Spanish university degrees [Fig. 20], in contrast with other countries, where it is one of the most difficult qualifications to access and attain.<sup>67</sup> The same is true in secondary education. In Spain, the best graduates do not usually pursue a teaching career in schools or secondary schools, but are mostly inclined towards other professional opportunities in the private sector or academic research. Those who do opt for the teaching profession must face a system of competitive examinations in which memorising is prioritised over other fundamental competencies that are practically ignored.

Fig. 20. Average grade for admission to undergraduate degrees, academic year 2018/19

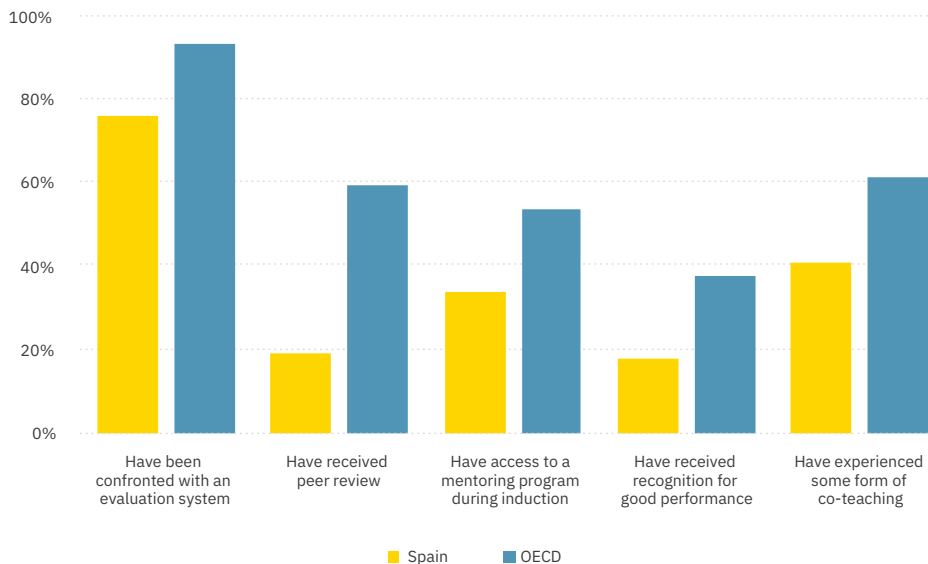


Source: Authors' own, based on Department of Universities.<sup>58</sup>

**Once teachers are incorporated into the system, training deficiencies are hardly ever corrected.**

The data indicate that, relative to their counterparts in other OECD countries, trainee teachers in Spain have 1) less access to a mentored induction system to teaching; 2) less peer recognition when they perform well; 3) less contact with forms of co-teaching; 4) less evaluation of their performance; and 5) less supervision and mentoring by their peers [Fig. 21].

Fig. 21. Teachers' perceptions of their careers and professional practice (% of total), 2018



Source: Authors' own, based on TALIS data.<sup>69</sup>



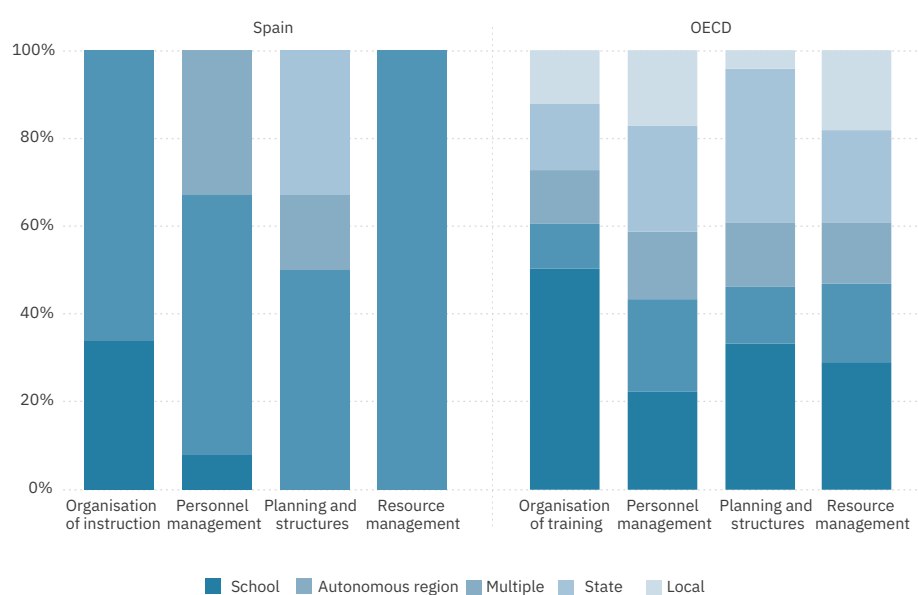
This situation is aggravated by the unequal distribution of professional capital across our educational landscape. **Teachers and management teams with better skills** in encouraging students' learning progress **tend to be concentrated in the same schools** (generally those with higher socio-economic levels), **while they are scarce among those with more vulnerable students** and where their contribution would be more critical, due to the lower availability of other support tools.<sup>70</sup> This phenomenon tends to make the deficiencies described above chronic and deepens the problem of school segregation.

### III. Educational governance

In Spain, educational decision-making falls to an overly **bureaucratised institutional system** that often ends up paying more attention to the enactment of laws<sup>71</sup> and the design of "structure" than to introducing "processes" and improving results. This, together with a model of inefficient coordination between the Department of Education and the autonomous communities,<sup>72</sup> prevents a greater use of the potential for experimentation and exchange of good practices that, in themselves, would facilitate decentralisation.

Another issue is the **low effective autonomy of our schools**, which is lower than that of OECD counterparts [Fig. 22], **and the lack of professional development among management teams**.<sup>73</sup> In fact, Spain is the only country in Europe where a professional career path for access to school management has not been established.<sup>74</sup> This lack of autonomy and professional development makes it difficult for the work in classrooms to align with the real world and needs of the environment, and hinders transformative school leadership - something that is essential to achieving greater equity and excellence.<sup>75</sup> Likewise, it contributes to the bureaucratisation of educational policy, accentuating the role of the autonomous governments as "administrators from above," instead of promoting a governance of support and collaboration with schools based on aligning objectives, advice for improvement, transparency, and empowering schools.<sup>76</sup>

Fig. 22. Educational decisions taken by level of responsibility, 2017



Source: Author's own based on OECD data.<sup>77</sup>

To these institutional weaknesses we must add others - such as the low level of professional development among educational administration and management; insufficient cooperation between research and decision-making;<sup>78</sup> the high degree of politicisation of debate on education at national, regional and municipal levels; the low cooperation of social stakeholders (unions, business organisations, parents' associations, students' associations); and the absence of an adequate framework of accountability. All of these are weaknesses that make it difficult to build consensus (or take advantage of those that already exist) in order to resolve the issues outlined above.<sup>79</sup>

#### IV. The evaluation system

**Having a well-designed evaluation mechanism that measures what really matters and generates accessible, useful and up-to-date data is key to identifying the strengths and weaknesses of educational stakeholders** (schools, teachers and authorities) **and to setting out a continuous improvement of the system.** Spain has made a lot of progress in this area, but it still lacks an effective mechanism to evaluate what happens within and outside the classroom.<sup>80</sup>

As far as **students** are concerned, assessment is still too focused on memorising content and on obtaining grades, which results in prioritising passing rather than learning and is strongly associated with problems such as high rates of retakes.<sup>81</sup> This phenomenon has its corollary in the **compulsory secondary education qualification system and university entrance exams (EBAU)**. The former evaluates the possibility of continuing education using a binary "yes" or "no", without offering intermediate options or alternative paths, and this contributes to the increase in school drop outs. The second is heir to a form of learning that is exclusively knowledge-based and, as such, represents an obstacle to the necessary paradigm shift towards competency-based learning that we have been discussing.

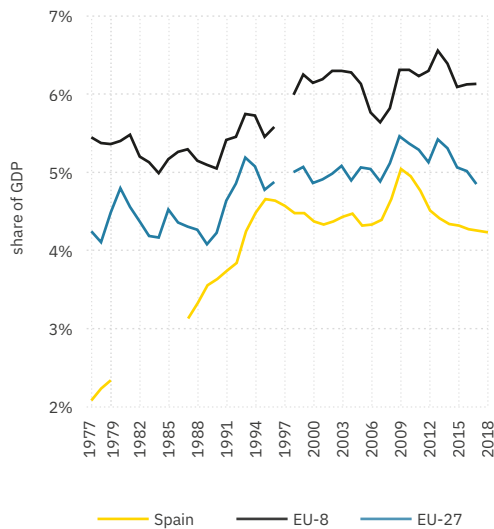
With regard to **teachers**, Spain does not yet have a system for evaluating the performance of teaching practice that can guide interventions for teachers' ongoing learning and improvement.<sup>82</sup>

As for **the authorities**, there is no agreed-upon or generally used model of external student assessment that would enable improvements in the planning, design, and implementation of education policies. The autonomous communities conduct diagnostic assessments, but each one does so in a different way: at different times (mid-stage, end of stage) and with different approaches (for example, some focus more on content and others on competencies). This lack of homogeneity and coherence is preventing us from taking advantage of one of the great profits of having 17 different educational systems - namely, of being able to experiment, compare solutions and extend those that produce the best results.<sup>83</sup>

#### V. Financing

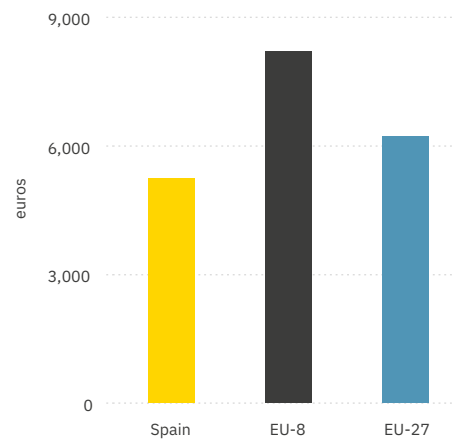
Although our public spending on education has doubled since the 1980s,<sup>84</sup> **it is still insufficient** for two reasons. First, because **it is significantly lower than that of other countries with which we must cooperate and compete in the global knowledge economy.** Spain devotes fewer resources to education than most EU countries, both in terms of expenditure relative to GDP [Fig. 23] and expenditure per student [Fig. 24], a situation that, far from being corrected, has actually worsened in the last twenty years.<sup>85</sup>

Fig. 23. Public spending on education



Source: Authors' own, based on data from the Department of Education and Vocational Training, and the OECD.<sup>86</sup>

Fig. 24. Public spending on Primary and Secondary per student, 2017



Source: Authors' own, based on Eurostat data.<sup>87</sup>

Second, our spending on education is insufficient because **it cannot pay for all the reforms and improvements that our system needs**. If Spain aspires to adopt a more competitive, sustainable and inclusive economic growth model [see chapter 1], it will need to drastically improve the quality of its human capital and, to do so, **it will need to invest as much in education as the EU-8 do**. Only by doing this will we be able to close the gap and guarantee a future among the most advanced countries in the world - especially in the context of strong demographic ageing and intense technological and environmental transformations.

**Of course, it is not all about increasing funding. The way it is used will also need to be streamlined and sophisticated.** One problem to be addressed in this regard is that, in our country, spending on education is concentrated on teaching staff, frequently at the expense of investment in infrastructure, non-teaching staff, support services and scholarships. Spain is one of the OECD countries with the lowest levels of resources devoted to its educational infrastructures.<sup>88</sup> As a result, many of our schools have not yet adapted to the new social, technological and environmental realities and lack the digital equipment and facilities necessary to provide flexible, inclusive and individualised attention to their students.

Spain also suffers from a deficit in non-teaching staff (staff with training in guidance, psychology, social work and extracurricular activities) and lack of investment in support services and scholarships for the most vulnerable in schools. This limits the system's capacity to respond effectively to current and future challenges associated with quality and equity.<sup>89</sup> It is therefore necessary to quantify the real cost of each school place at each educational stage - something that is necessary for public funding to respond adequately to the educational needs, both in the public and in the private government-dependent network.

### Today's weaknesses are tomorrow's opportunities

In short, **despite the enormous progress made in recent decades, Spain's education system still has significant issues to resolve**, both in terms of coverage and learning, which are hindering us

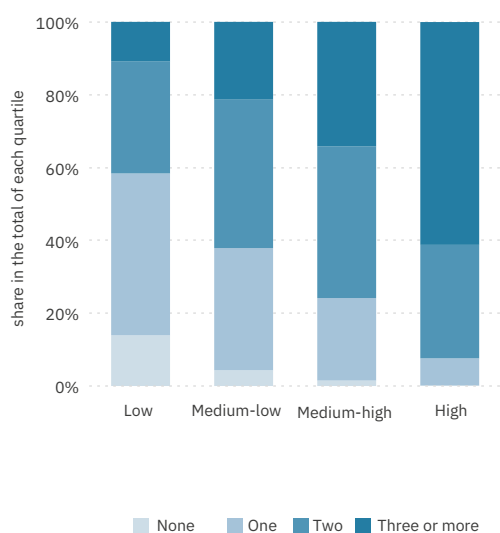
from realising the full potential of every student and are having knock-on effects on employment, the economy and well-being in society. If we wish to converge with the most advanced countries in the EU, we will need to address them - not as chronic or inherent problems within our system, but as feasible and specific opportunities for improvement. This is not a utopian aspiration. As we will see below, **Spain's education system has the potential to be among the most advanced in the world.** In fact, the next few years will provide us with a good opportunity to achieve this.

## THE FUTURE: POSSIBLE DESTINATIONS

### The short term: education during the coronavirus crisis

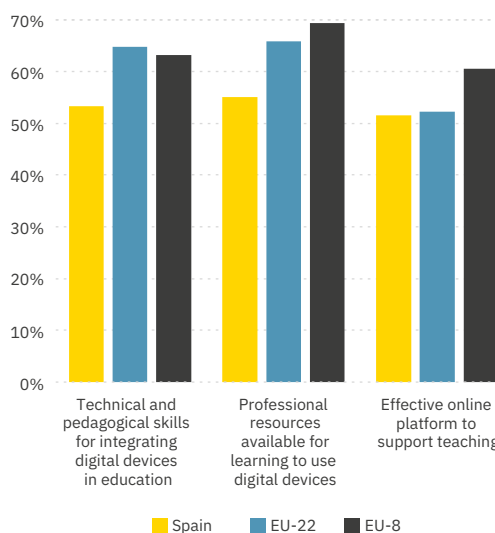
The coronavirus pandemic has led to an unprecedented educational emergency that has exposed the strengths as well as the fundamental weaknesses in our system. In order to stop the spread of the virus, in March 2020 all schools in Spain were closed and their 9.5 million pupils were forced to continue their education online. This sudden exodus from face-to-face education to *online* training meant **a relative deterioration in the pace of learning. This particularly affected those from more vulnerable socio-economic backgrounds**, due to the differences that exist between schools and between households in terms of capacity for mentoring and access to digital devices<sup>90</sup> [Figs. 25 and 26]. In fact, the first available studies estimate that, during the initial weeks of the March lockdown, **almost a third of children and adolescents in school in Spain had no access to any learning activity or virtual relationship with their teachers or tutors.**<sup>91</sup>

Fig. 25. Computers in the home by socioeconomic quartile in Spain, 2018



Source: Authors' own, based on PISA 2018.<sup>92</sup>

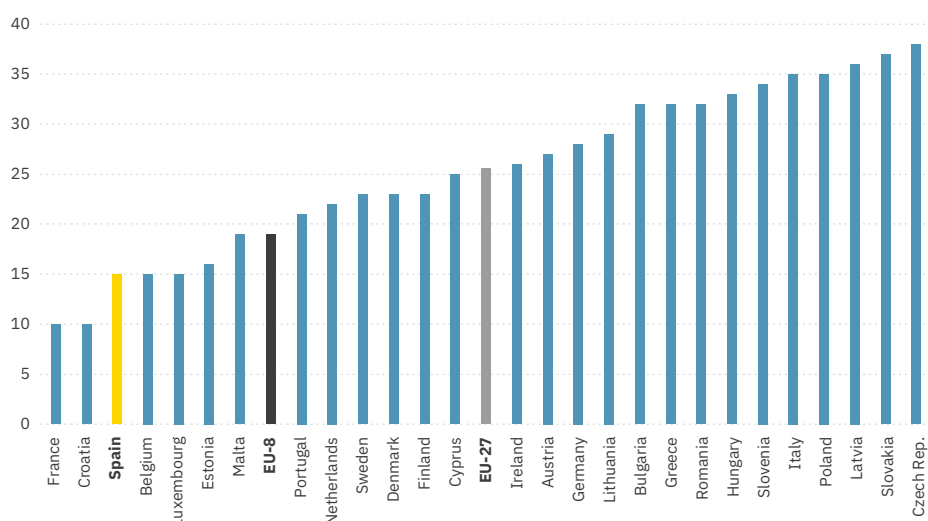
Fig. 26. Digital skills and resources of teachers, 2018



Source: Authors' own, based on PISA 2018.<sup>93</sup>

Thanks to the enormous effort on the part of teachers, schools, and in students' homes, in-person teaching could be restored and maintained for a good part of the 2020-21 academic year. In fact, the data indicate that **Spain is among the EU countries that have lost the fewest weeks of school as a result of the pandemic** [Fig. 27].

Fig. 27. Number of weeks with schools totally or partly closed from March 2020.



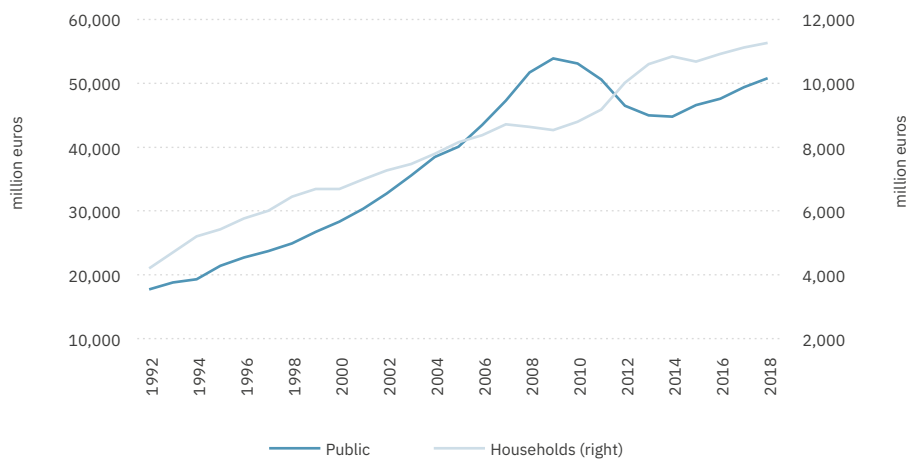
Source: Authors' own, based on UNESCO data.<sup>94</sup>

Even so, it is clear that levels of "virtual dropping out" suffered in this period will have an impact in the medium and long term. There is already evidence that it has caused **a loss of learning and motivation** among many pupils - something that could eventually lead to **an increase in rates of absenteeism, school drop-out rates and even a reduction in future income among the most disadvantaged groups**.<sup>95</sup>

It also remains to be seen what effects the economic crisis triggered by the pandemic will have. If powerful measures are not taken, **the same patterns seen during the 2008 recession could occur again** between 2021 and 2023. On the one hand, the collapse of the hospitality industry and other ancillary activities will probably reduce the supply of low-skilled jobs, which will discourage pupils from leaving school early and lead to higher graduation rates in upper secondary school, vocational training and High School.<sup>96</sup> On the other hand, the increase in unemployment and the fall in many households' incomes will probably result in a worsening of learning outcomes, which above all will affect children from the most vulnerable families.<sup>97</sup>

One of the greatest threats, though, is that there will be a reduction in public investment in education, as has happened in the past. Between 2009 and 2014, education spending in Spain was cut by 17%, as the number of students enrolled increased.<sup>98</sup> This cut was partially offset by an increase in private household spending and, therefore, resulted in more regressive total education spending [Fig.28].<sup>99</sup> The risk is that a similar phenomenon will occur in the coming years, which would further aggravate existing educational inequalities [see chapter 8].<sup>100</sup>

Fig. 28. Public and household expenditure on education in Spain



Source: Authors' own, based on OECD and Department of Education and Vocational Training data.<sup>101</sup>

The measures implemented by national and regional governments in recent months, and the implementation of European recovery funds,<sup>102</sup> under which education and knowledge are a priority, could help to reduce the adverse effects of this scenario.

### The medium and long term: an educational revolution is possible

In the coming decades, **digitalisation will transform the way we consume, process and use information.** The widespread use of technologies such as advanced sensors and artificial intelligence will reduce the importance of memorised details and will mean a re-evaluation of social, emotional, and creative skills.<sup>103</sup> It is these that will guarantee better performance in an increasingly complex and specialist world [see chapter 7]. Students will have to learn to work with machines rather than compete against them.<sup>104</sup> This will require greater knowledge in science, technology, engineering and mathematics (STEM), as well as better cognitive skills (such as creativity and deductive reasoning), social skills (such as communication, teamwork, leadership, and negotiation) and emotional skills.<sup>105</sup> These are skills in which humans are better than machines.<sup>106</sup> This transformation, together with the acceleration of technological change, will increase the competitive advantage of educational systems that are more versatile and more focused on the acquisition of skills than on memorising content.

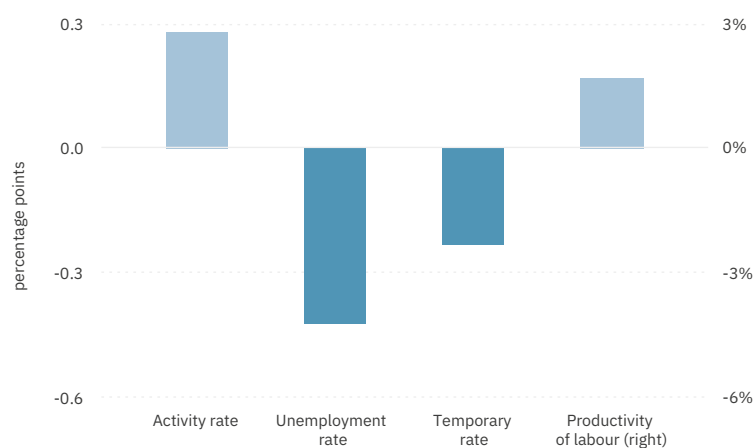
In this future scenario, the modernisation of our country's education system will be more necessary more than ever. If they are not tackled, the shortcomings outlined above will continue to grow and take their toll on our society and economy. **Between now and 2050, 3.4 million pupils could be held back a year in Spain and around 2 million could drop out of school early.**<sup>107</sup> This is something that, in most cases, would lead them to a precarious working life and significantly increase their chances of falling into poverty and social exclusion. Similarly, **without measures being implemented, learning levels will stagnate and Spain could be surpassed in educational quality by countries that have lower incomes, but a strong commitment to education - such as Portugal, Hungary and Latvia.** This would pose an immense challenge to the long-term growth of our economy as well as the professional development of our young people who, due to remote working, will increasingly have to compete in a globalised labour market.

The good news is that these prognoses, which are based on a linear projection of trends recorded in recent decades, do not necessarily hold true. The challenges facing the Spanish education system are remarkable. However, **there is nothing to suggest that we cannot overcome them and lead an educational revolution during the coming decades, as we did at the end of the last century.** We have the institutions and the talent we need. What we now need to do is design an ambitious plan for the future and generate the right social and political consensus to implement it.

Doing so will bring immense benefits to society as a whole. For example, **if we manage to reduce the percentage of 15-year-old pupils who have retaken school years at least once from the current 28% to 10%,** Spain would gain learning that is equivalent to almost 6 months of additional schooling.<sup>108</sup> **We would also save about 900 million euros per year** (equivalent to 3-4% of the budget for primary and secondary schooling).<sup>109</sup> This money could be used to fund other policies and **significantly close the social education gap,** as 49% of 15-year-old pupils who have ever retaken a year come from vulnerable socio-economic backgrounds.<sup>110</sup> Reducing the percentage of pupils retaking years by 18 percentage points will not be easy, but it is **perfectly feasible** - not least because our high rates of retakes have nothing to do with the ability of our young people but rather with the design of our assessment system and the insufficient support that pupils from the most disadvantaged backgrounds receive. These two issues can be quickly tackled.<sup>111</sup> In fact, there are currently 13 EU countries with retake rates of below 10%.<sup>112</sup>

Similarly, **if we were to reduce the percentage of school dropouts from the current 17% to 10% in 2030** (the EU target for 2020)<sup>113</sup> and get all of them to complete at least post-compulsory secondary education, **we could cut our structural unemployment rate by 4 tenths of a percentage point and increase labour productivity by 1.7%** [Fig. 29].

Fig. 29. Potential effect of reducing the early school drop-out rate to 10% in Spain



Source: Authors' own, based on Serrano et al<sup>114</sup>

A 7 percentage point reduction in the drop-out rate in ten years may seem like a lot. But it is worth noting that, **so far this century, several European countries (including our own) have achieved greater or similar progress** [Fig. 30].



**Fig. 30. Countries that have reduced their dropout rates in recent decades**

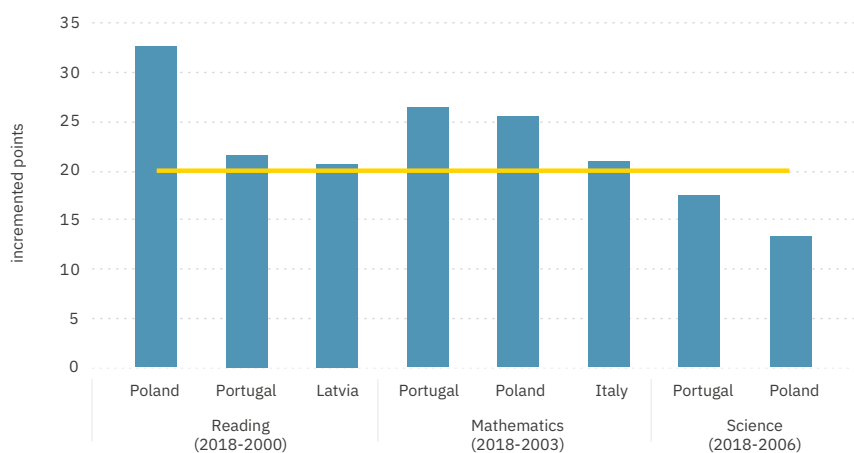
Country	Progress made	Reduction in percentage points	Years required
<b>Spain</b>	<b>31% in 2009 - 17% in 2019</b>	<b>14</b>	<b>10</b>
Greece	14% in 2009 - 4% in 2019	10	10
Portugal	31% in 2009 - 11% in 2019	20	10
United Kingdom	20% in 1999 - 11% in 2015	9	17
Netherlands	18% in 1996 - 10% in 2010	8	14

There are 10 countries in the EU with a drop-out rate below 10%: Austria, Croatia, Slovenia, Finland, Ireland, Lithuania, Netherlands, Poland, Czech Rep. and Sweden

Source: Authors' own, based on Eurostat data.<sup>115</sup>

The same sense of possibility can be seen in the challenge of learning. **If we succeed in increasing our PISA scores by 20 points for the main skills (mathematics, reading and science) to levels of 500 points (the EU-8 average) by 2050, Spain's GDP could grow by an additional 0.5 percentage points per year in the following decades. Furthermore,**<sup>116</sup> the competitiveness of our workforce and businesses would increase considerably and the economic and social well-being of citizens would improve.<sup>117</sup> **Is it possible to improve our PISA scores by 20 points in 30 years?** Yes, it is. In fact, so far this century, countries like Poland, Portugal, Latvia and Italy have achieved a similar improvement [Fig. 31].

**Fig. 31. Increases in PISA scores achieved by different EU countries between 2018 and the first year available in different subjects**



Source: Author's own based on data from the OECD.<sup>118</sup>

Moving from a score of 480 to 500 takes more effort than going from 460 to 480. However, it is also true that **Spain still has easy to implement improvements pending which have a great potential impact in terms of learning.** For example, it is estimated that simply reducing the rate of pupils retaking years to OECD average levels could translate into an increase of 12 points in terms of PISA.<sup>119</sup>

It should also be borne in mind that **over the coming decades there will be a series of demographic and technological changes that, if well exploited, will make it even more feasible to achieve the improvements we need.**<sup>120</sup> **In 2050, Spain will have 800,000 fewer students aged** between 3 and 15.<sup>121</sup> This is equivalent to having about 33,000 fewer classrooms of 24 students than in 2019.<sup>122</sup> This sharp contraction in the student population will force the closure of several schools (especially in rural Spain) and the downsizing of many others. However, if well managed, it will also open the door to a number of extensive improvements in the system. To start with, **our country will be able to double its spending per pupil on infant, primary and secondary education, from the current 4,880 euros to around 9,640 euros in 2050 (Denmark's current level)**<sup>123</sup> **with hardly any increase in public spending.**<sup>124</sup> This injection of resources will help promote practices such as co-teaching, increase tutoring support for pupils who are lagging behind, and improve conditions for teaching staff.<sup>125</sup> Any facilities that are no longer needed can be reconverted and used for other types of learning, such as pre-school education from 0 to 3 years or adult re-qualification, for which demand will grow in the future [see chapter 3].

The greater availability of economic resources will also enable us to promote digitalisation in our education system - which has already begun with the injection of European funds. In the coming decades, **the spread of new technologies will change the way students learn, and are taught, assessed and tutored in our schools.** Artificial intelligence will enable us to drive forward a more personalised and deeper learning, aligned with the pace and individual features of each student. For example, there are already systems capable of analysing translations done by students in foreign language classes and helping them reinforce their knowledge based on their mistakes.<sup>126</sup> In the near future, these technologies will be applied to all subjects and will allow teachers to correct and analyse their pupils' exams and assignments more frequently and in greater detail, thus allowing for a more personalised monitoring of pupils' progress. These same systems will make it possible to identify loss of interest or learning issues, pick up early on risks of retakes or dropout,<sup>127</sup> and provide students with additional in-person or online assistance.<sup>128</sup> These systems will also facilitate early diagnosis of a range of learning disabilities (such as dyslexia,<sup>129</sup> autism,<sup>130</sup> and attention deficit hyperactivity disorder)<sup>131</sup> as well as expand learning opportunities for people with disabilities.<sup>132</sup>

The digitalisation of classrooms will also enable schools to exchange data and share skills and knowledge between teaching teams online, which could lead to a reduction in inequality between schools as well as crucial support for rural schools and a significant improvement in learning outcomes.

Naturally, in order for these changes to take place, profound reforms in our system will be needed: a commitment to educational R&D, the digitalisation of data and knowledge management systems, the modernising of infrastructures, and retraining much of the teaching staff. We will also have to learn to deal with the potential negative effects that using digital devices may have on pupils' concentration, learning and well-being.<sup>133</sup> However, there is nothing to suggest that we cannot succeed in integrating digital technology into our education system.

In summary, **Spain must make a drastic commitment to education as one of the main ways of ensuring the well-being and prosperity of future generations.** The trajectory of recent decades and the changes that are beginning to appear in the near future suggest there is reason for optimism. **If Spain commits itself to this, it can become a leader in education by 2050.**

**How can this be achieved?** Some measures are suggested on the following pages.

## WHAT NEEDS TO BE DONE TO ENSURE PROGRESS IN EDUCATION

Between now and 2050, **Spain will have to become an educational leader** if it wants to remain a prosperous and inclusive country, capable of competing and collaborating on equal terms with the world's most advanced economies. **Doing so will mean drastically reducing our dropout and retake rates; increasing the proportion of people who access post-compulsory education; and improving learning levels and equity across the system.**

It is difficult to attain that which cannot be measured. It is therefore essential that, in the coming years, our country uses social dialogue to reach a **consensus on a table of quantifiable indicators and a list of specific objectives** that will enable us to monitor the progress made and guide the ambition of our reforms. Here are some suggestions following the principles outlined in the Introduction to this *Strategy*:

**Goal 7.** Reduce the percentage of students who, at the age of 15, have been held back a year at least once, from the current percentage of 29% to 5% by the middle of the century.

**Goal 8.** Reduce the school dropout rate from the current 17% to 3% by 2050.

**Goal 9.** Ensure that 93% of the population aged 25 to 34 has an education level higher than compulsory secondary education by 2050 (compared to the current 70%). In order to achieve this objective, the period between 16 and 18 years of age should be considered as a formative stage.

**Goal 10.** Improve the equity of the system, especially by increasing opportunities for those who come from the most disadvantaged backgrounds. This implies reducing the significance of social background in regard to school access, being held back a year and dropping out in order to reach the EU-8 average by 2050.

**Goal 11.** Improve national learning outcomes, by reducing the proportion of 15-year-olds who perform below the EU target of 15% by 2050 in reading, maths and science (below level 2) in PISA (or other national diagnostic) assessment.<sup>134</sup>

**Goal 12.** Encourage excellence within the education system by doubling the current proportion of 15-year-old pupils with high performance in PISA (or other national diagnostic assessment) in reading, maths and science (level 5 or above) to converge with the EU-8 average by 2050.

**Goal 13.** Progressively increase public spending on education to 5.5% of GDP by the middle of the century, ensuring a similar improvement in spending per student. This increase in funding must be accompanied by significant improvements in the efficiency and composition of spending.

Table of indicators and targets

Indicators		Place	Average 2015-2019 or latest data available*	Targets			
				2030	2040	2050	
7	Percentage of pupils who have repeated at least one grade at age of 15 <sup>135</sup>	Spain	29%*	18%	10%	5%	
		EU-27	12%*	–	–	–	
		EU-8	14%*	–	–	–	
8	Early school dropout rate <sup>136</sup>	Spain	17%*	10% <sup>137</sup>	6%	3%	
		EU-27	10%*	–	–	–	
		EU-8	8%*	–	–	–	
9	Population aged 25-34 with more than lower secondary education <sup>138</sup>	Spain	70%*	78%	86%	93%	
		EU-27	85%*	–	–	–	
		EU-8	87%*	–	–	–	
10	Importance of socio-economic differences on the probability of repetition at equal skills levels <sup>139</sup>	Spain	3.9*	3	2	1	
		EU-22	2.0*	–	–	–	
		EU-8	1.5*	–	–	–	
11	Percentage of 15 year olds with low performance in PISA (below level 2) <sup>140</sup>	Reading	Spain	20%	18%	15%	<15%
		Mathematics		23%	20%	18%	<15%
		Science		20%	18%	15%	<15%
		Reading	EU-22	20%	–	–	–
		Mathematics		21%	–	–	–
		Science		20%	–	–	–
		Reading	EU-8	19%	–	–	–
		Mathematics		18%	–	–	–
		Science		19%	–	–	–
12	Percentage of 15-year-olds with high performance in PISA (level 5 or above) <sup>141</sup>	Reading	Spain	5%	6%	8%	10%
		Mathematics		7%	10%	13%	16%
		Science		5%	6%	8%	10%
		Reading	EU-22	8%	–	–	–
		Mathematics		11%	–	–	–
		Science		7%	–	–	–
		Reading	EU-8	10%	–	–	–
		Mathematics		13%	–	–	–
		Science		9%	–	–	–
13	Public expenditure on education (% of GDP) <sup>142</sup>	Spain	4.3%	5.1%	5.3%	5.5% <sup>143</sup>	
		EU-27	5.0%	–	–	–	
		EU-8	6.1%	–	–	–	

To achieve these objectives, our country will have to undertake **far-reaching reforms and implement significant initiatives** on several fronts. Here are a few suggestions:

### Front 1: Redesign the curriculum

We must change the way in which the curriculum taught in our schools is conceived, designed and implemented. To this end, we propose the following:

- Promote an open construction of the curriculum that allows us to identify what are the essential knowledge and skills at each educational stage. The process should be participatory and consensual, with the collaboration of the academic, teaching and research community as well as families and students themselves. Some experiences in this field that can be referred to are the curricular reforms carried out by Croatia, Chile and Portugal.<sup>144</sup>
- Develop a curriculum, focused on acquiring and assessing skills, that is comprehensive, interdisciplinary, and global without being encyclopaedic, and which emphasises the practice of "learning to learn"<sup>145</sup> and which thereby creates more motivating, deep and challenging learning in accordance with age and cognitive evolution. This curriculum should broaden the learning experience beyond simply acquiring knowledge, be based on the key competences identified by the European Commission,<sup>146</sup> and develop, among other things:
  - STEM disciplines, which will have to be included in all training cycles.<sup>147</sup> To this end, the population's mathematical skills need to improve. If abstract thinking is not mastered, it is difficult to understand many of the concepts contained in different software packages;
  - the skills necessary to develop critical thinking, creativity and forward thinking, as well as articulating them through oral and written expression;<sup>148</sup>
  - the technical skills of our time, such as multilingualism, programming and financial literacy;
  - the overall skills that enable students to analyse, question and propose solutions to the major challenges of the 21st century, such as climate change [see chapter 4],<sup>149</sup> inequality, and demographic pressure; managing multiple identities and build bonds of loyalty and solidarity, based on civic commitment and a respect for diversity, that are necessary for life in society;<sup>150</sup>
  - skills aimed at improving students' physical and mental health [see chapter 9];
  - socio-emotional, humanistic and spiritual skills that help this population deal with the potential effects of digital devices (on concentration, privacy and rest)<sup>151</sup> and with psychosocial phenomena such as failure, success, pain, depression or anxiety, thus

achieving greater life satisfaction [see chapter 9].

- Complete the process of decentralising the curriculum in schools. We need to provide education centres with a greater capacity for specific curriculum development, which will allow them to provide a more tailored response to the actual situation in their environment. Ultimately, the new curriculum would have three skills-related parts:
  - a basic national part, which ensures a minimum level of learning for pupils and coherence between the Spanish system with the European Union framework;
  - a part stipulated by the autonomous communities;
  - a part designed by the school itself.

In addition, under teachers' guidance, the pupils' capacity for choice should be increased, so that they can shape part of their curriculum in line with their expectations and concerns.

- Ensure flexibility and continuous updating of the curriculum, with regular reviews every 8 to 10 years.<sup>152</sup> This is the policy pursued by Finland since the 1980s that puts it at the forefront of teaching techniques and the changing demand for skills and competences. The recent announcement of the creation of an Institute for Curriculum Development is a positive step in this direction<sup>153</sup>
- Apply a forward-looking vision in all curriculum design.<sup>154</sup> The children coming into our education system today will take 20 to 30 years to enter the world of work. To avoid them being totally out of date by the time they do so, it is essential to keep an eye to the future and anticipate some of the needs that will arise tomorrow [see chapter 3].

### **Front 2: Make progress towards greater professionalisation in the teaching profession.**

The quality of an education system depends on its teachers' ability and motivation. If Spain wants to achieve excellence, it will need to considerably improve the selection, training, professional development, working conditions, and social recognition of teaching staff, and position them as key players in the knowledge society. To do this, the following changes are recommended:<sup>155</sup>

- Strengthen teachers' selection and initial training.
  - Reform education faculties: update curricula, re-balance the excessive proportion of didactic teaching towards interdisciplinary fields, and introduce the latest advances in educational research.
  - Develop new specialist areas that fit the teaching profiles sought by schools.
  - Encourage primary and secondary school teachers to pass on their experience to bachelor's and master's degree students in teacher training, respectively.
  - Improve systems for selection and accessing the teaching profession after bachelor's and master's degrees, so that entry requirements are raised and examination processes are adapted, so that these recognise skills that education in the 21st century really

needs (motivation, communication and social-emotional skills, managing diversity and classroom situations, leadership) and not simply the ability to memorise syllabuses.<sup>156</sup>

- Implement an effective induction process.
  - Induction could consist of a period of continuous paid work experience, for example, for two school years in an educational establishment. This process would allow teachers to progressively acquire the necessary skills.
  - New teachers should join a collaborative team with fully qualified teachers with whom they will share lessons and who will oversee the coordination of their daily work. Systems for more experienced teachers to provide mentoring should also be put in place to prepare new teachers to successfully deal with the complexities of teaching.<sup>157</sup>
  - A network of specialist training centres should be created to combine educational work with training new teachers in a range of social contexts.
- Promote and require continuous learning and training throughout teaching careers. Ambitious retraining programmes will have to be implemented nationwide along with regular evaluation mechanisms. The fact that, in 2030, around 40% of Spanish teaching staff could be over 50 years old makes the creation of these programmes particularly relevant.<sup>158</sup>
- Institutionalise routes for professional growth within the teaching profession. Two could be established: a horizontal option, in which professional advances would not imply a change of stage or teaching responsibility; and a vertical option, which would imply a change of stage and an evolution from teaching activity to other types of functions. Both routes would be capable of being assessed and progress in the vertical option would be associated with management, training and educational innovation functions.
- Encourage men to pursue a career in teaching. In order to move towards gender equality in society, we would need to encourage men to work in the early stages of education. Currently, there is a clear majority of female teachers, especially at infant (98%) and primary (81%) stages. This contrasts with changes in society<sup>159</sup> and could contribute to the perpetuation of gender stereotypes such as the one that associates education and care exclusively with women.
- Encourage knowledge transfer between schools, vocational training centres and universities, making it easier for university and vocational training teachers and researchers to be involved in primary, secondary and baccalaureate teaching, and vice versa.
- Involve the best teachers in less favourable socio-economic contexts and in educational innovation and research, for example, by linking professional development and remuneration to greater involvement in these projects. This is what other countries such as Australia and France have done.<sup>160</sup>



- Advance professional development in the early childhood education stage (0- 3 years), by promoting both ongoing training and the improvement of teachers' working conditions, and the evaluation of teaching processes and performance.

### Front 3: Improve the governance of the education system

- Strengthen horizontal cooperation between autonomous communities to promote the exchange of data, knowledge and experiences between them. To achieve this, we suggest five priority actions:
  - Strengthen National Cooperation Programmes.<sup>161</sup> These should be diversified both in terms of content and the stakeholders with which they work (autonomous communities, provincial councils, town councils).
  - Leverage digital technologies to expand and integrate the various available databases, making them a key tool for policy and programme monitoring, evaluation and design.
  - Standardise the use of experimentation as a working method, to identify what works and what doesn't, following principles such as the smart state and systems that learn.<sup>162</sup>
  - Strengthen the Sectoral Conference allowing greater deliberation and advice on matters of joint governance.
  - Set a strategy with shared objectives, indicators and targets for improving quality and equality, aligning them with the realities and aspirations of each autonomous community, following the example of the European and Spanish 2010 Goals and the Education and Training Strategy 2020.<sup>163</sup> This strategy should be in line with the European framework for the period 2021-30.<sup>164</sup>
- Improve the professional and international development of political positions and mid-level technical staff of the autonomous communities and the Department of Education and Vocational Training, with continuous training programmes and exacting evaluation systems.
- Extend schools' autonomy and organisational capacity, following the European experience. The idea is that schools can better adapt classroom work to the reality and needs of their environment - something that is essential to achieving greater equity and better learning outcomes.<sup>165</sup>
- Establish admission rules and control mechanisms to ensure a balanced schooling: without segregation, free of charge, and that encourages co-responsibility between public and private government-dependent networks.<sup>166</sup>
- Promote greater accountability of schools to the educational community and the administration, based on information from diagnostic assessments and other robust

reporting tools, with the aim of developing improvement plans and systematising their innovations.

- Modernise educational inspection, strengthening its ongoing support role to schools and as a coordinating mechanism for sharing improvements between them.
- Make schools more open to other stakeholders who have a commitment to the common and public aspects of education. Schools should become nodal points within an ecosystem of connected learning in the community, with an active role played by museums, libraries, cultural industries, businesses and community organisations as networked educational agents.

#### **Front 4: Promote an effective evaluation system, supported by a culture of transparency and accountability**

- Introduce a model of skills-based certification of learning at the end of compulsory secondary education, to replace the current system of qualifications. The aim should be to achieve greater flexibility in access to training opportunities after compulsory education ends, and tailor learning pathways for each pupil. The objectives of the University entrance exam (EBAU) should also be redesigned in order to move towards skills-based assessment.
- Strengthen and adapt diagnostic assessments.<sup>167</sup> Make assessments at national level (with common items) and regional level (with items specific to each autonomous community) compatible with the aim of identifying progress, designing improvement plans and sharing best practice between schools and administrations.<sup>168</sup> These assessments should be recurrent over time, and the resulting data should be made available to the academic and research community, so that it can also help with monitoring and improving educational policies.
- Promote continuous assessment aimed at improving each teacher and the institutional development of each school, and implement a professional evaluation portfolio based on teaching performance indicators and a peer evaluation system.
- Develop the National System of Indicators, deepening the themed areas (for example, equality and longitudinal analysis of results), coverage (available for all autonomous communities), disaggregation by student profile and agility of updating (in real time using automatic learning algorithms). This would allow a better use of information by teaching teams, the educational community and families and would help strengthen their decision-making
- Create an independent institution that connects scientific evidence with educational policy and practice, inspired by models such as the Education Endowment Foundation<sup>169</sup>(UK), the Best Evidence Synthesis<sup>170</sup> (New Zealand) and the What Works Clearinghouse<sup>171</sup> (USA). The initial areas of activity could be: systematically evaluating the benefits of generally applying the "split school day" on academic results compared to the "no lunch break school day",<sup>172</sup> and study the suitability of changing the mechanism for assigning schools to students.<sup>173</sup>

## Front 5: Improve funding

Without increased and better allocated funding, it will be impossible to achieve the goals set out above.<sup>174</sup> It is therefore essential to progressively **increase the financial resources devoted to education to reach the current EU-8 average** [Figs. 23 and 24]. **The goal is to be able to:**

- Finance the proposed policies on modernising the curriculum, professionalising teaching, improving governance instruments and creating an effective evaluation system.
- Finance the expansion and improved quality of the public network of centres for early childhood education, upbringing and care, in order to ensure universal, free, high-quality early childhood education (from 0 to 3 years). Although our school enrolment rate at these ages is higher than the EU-8 and EU-27 averages, in Spain there are still many children aged 0-3 who are not in school. This is especially true of children from the most vulnerable settings. Studies show that training at this early age is, in fact, one of the most effective ways to improve educational results and the quality of human capital, especially in countries such as ours that has a high number of children in vulnerable situations and with a training stage that is strongly impacted by the precarious employment of a large proportion of the population [see chapter 7].<sup>175</sup>
- Finance a plan of infrastructures and educational equipment for the purposes of digitalisation and aligning with the environmental transition (for example, efficient air conditioning and insulation, trees in playgrounds for thermal regulation, supporting the installation of mini-solar power plants that help with sustainable development).
- Increase funding for educational innovation and transformation, as well as for research resulting from increased access to and transparency of educational indicators.
- Finance additional measures aimed at reducing inequalities (of opportunity and results) experienced by students and which originate in differences between schools, regions, skills and their families' socio-economic circumstances. This will require several measures:
  - Develop equitable funding of schools based on socio-educational complexity. To this end, underfunded schools should be identified internally, and then special allocations should be made available to eliminate the funding gap.<sup>176</sup>
  - Establish a floor for investment for students in all autonomous communities, so that it never falls 90% of the national average.
  - Expand the coverage and number of scholarships. For example, with new packages that help promote return to the education system or encourage groups at risk of dropping out to stay in school.
  - Institutionalise reinforcement plans for vulnerable students (compulsory for autonomous communities).
  - Strengthen progress among pupils with learning difficulties, increasing the provision in the areas of guidance, psychological care and extracurricular activities.

- Address the funding gap of privately-owned state-funded schools, quantifying the actual cost of ordinary operation and focusing on diversity (which do not cost anything), with the aim of improving access opportunities and reducing school segregation.<sup>177</sup>
- Fund children's right to food through breakfast grants and lunchtime services.
- Ensure the availability of transport and meal service, in order to facilitate early schooling, especially in rural areas.

#### **Front 6: Expand and diversify post-compulsory education options**

A significant part of the high school drop out rates and educational deficiencies among our population comes from the lack of flexibility in accessing educational opportunities after compulsory schooling. Spain will need to develop an open, multi-modal system that: provides **tailored training options for students, leads to post-compulsory schooling qualifications** for the majority of students (adapting and strengthening the vocational training model), and **ensures that all students graduate with the ability to continue learning and training for life**[\[see chapter 3\]](#).

**If these measures are taken, Spain can be at the forefront of education by 2050.**

## CHALLENGE #2: MOVE TO THE FOREFRONT OF EDUCATION

<sup>1</sup> The General Education Law of 1970 was a first step towards the modernisation of the education system in Spain. See: Official State Gazette. *Ley Orgánica 14/1970, de 4 de agosto de, General de Educación y Financiación de la Reforma Educativa*. Madrid, 1970. <https://www.boe.es/boe/dias/1970/08/06/pdfs/A12525-12546.pdf>.

<sup>2</sup> Official State Gazette *Spanish Constitution* Art. 27. Madrid, 1978. <https://www.boe.es/legislacion/documentos/ConstitucionCASTELLANO.pdf>.

<sup>3</sup> Between 1977 and 2000, public spending on education as a percentage of GDP increased from 2.1% to 4.4%, a level similar to that observed in 2018. For further details, see: Department of Education and Vocational Training. *Gasto Público en educación en relación al P.I.B. por cobertura económica, tipo de administración y periodo*. <https://www.educacionyfp.gob.es/servicios-al-ciudadano/estadisticas/recursos-economicos/gasto-publico/series-2018-dp.html>; and UNESCO. *Government expenditure on education as a percentage of GDP (%)*. <http://data.uis.unesco.org/#>.

<sup>4</sup> Department of Education and Vocational Training. *Enseñanzas no universitarias. Sociedad de la información y la comunicación en los centros educativos. Series*. <http://www.educacionyfp.gob.es/servicios-al-ciudadano/estadisticas/no-universitaria/centros/sociedad-informacion/series.html>.

<sup>5</sup> Viñao, Antonio. *Escuela para todos: Educación y modernidad en la España del siglo XX*. Madrid: Marcial Pons Historia, 2004.

<sup>6</sup> For further details, see: Marchesi, Álvaro. “La LOGSE en la educación española. Breve relato de un cambio histórico.” *Avances En Supervisión Educativa*, n.º 33, 2020. <https://doi.org/10.23824/ase.v0i33.681>; and Martín Ortega, Elena. “El papel del currículo en la reforma educativa española.” *Investigación en la Escuela*, n.º 36, 1998. <https://dialnet.unirioja.es/servlet/articulo?codigo=116998>.

<sup>7</sup> Benayas del Álamo, Javier, *et al.* “Educación para la sostenibilidad en España. Reflexiones y propuestas.” *Documento de trabajo Opex*, n.º 86/2017, 2017. [http://www.fundacionalternativas.org/public/storage/opex\\_documentos\\_archivos/81ef826c30f2322a5c9c8536a50faf20.pdf](http://www.fundacionalternativas.org/public/storage/opex_documentos_archivos/81ef826c30f2322a5c9c8536a50faf20.pdf)

<sup>8</sup> Colectivo Lorenzo Luzuriaga. *Logros, problemas y retos del Sistema Educativo Español: La formación del profesorado*. 2014. <http://www.colectivolorenzozluzuriaga.com/PDF/FORMACION%20DEL%20PROFESORADO.pdf>.

<sup>9</sup> Castillo Arredondo, Santiago, and Jesús Cabrerizo Diago. *Evaluación educativa de aprendizajes y competencias*. Madrid: Prentice Hall, 2010.

<sup>10</sup> In the 1980s, the average number of students per teacher in secondary education in Spain was more than 20, while in 2017 it was 12. This ranks our country in the European average. For further details, see: World Bank. *Pupil-teacher ratio in secondary education (headcount basis)*. <https://datatopics.worldbank.org/education/>.

<sup>11</sup> García Rubio, Juan. “Evolución legislativa de la educación inclusiva en España.” *Revista Nacional e Internacional de Educación Inclusiva*, n.º 10, 2017. <https://revistaeducacioninclusiva.es/index.php/REI/article/view/271/0>.

<sup>12</sup> The percentage of students with scholarships in non-university education is calculated as the quotient between the number of students with scholarships in compulsory education, pre-primary education, special education and non-university post-compulsory education, and the total number of students in non-university education. For further details, see: Department of Education and Vocational Training. *Alumnado de Enseñanzas de Régimen General por titularidad del centro, comunidad autónoma y periodo*. <http://estadisticas.meecd.gob.es/EducaDynPx/educabase/index.htm?type=pcaxis&path=/Educacion/Alumnado/Matriculado/Series20/SeriesAlumnado&file=pcaxis&l=s0>; and Department of Education and Vocational Training. *Anuario estadístico. Las cifras de la educación en España [B5. Las becas y ayudas a la educación]*. <https://www.educacionyfp.gob.es/servicios-al-ciudadano/estadisticas/indicadores/cifras-educacion-espana.html>

<sup>13</sup> Department of Education and Vocational Training. *Enseñanzas no universitarias. Alumnado matriculado. Series. Alumnado matriculado por enseñanza. Enseñanzas de Régimen General; y Alumnado extranjero por enseñanza*. Madrid, 2020. <http://www.educacionyfp.gob.es/servicios-al-ciudadano/estadisticas/no-universitaria/alumnado/matriculado/series.html>.

<sup>14</sup> Between 2000 and 2018, secondary school repetition rates have fallen from 13% to 9%. For further details, see: Department of Education and Vocational Training. *Sistema estatal de indicadores de la educación*. <https://www.educacionyfp.gob.es/inee/indicadores/sistema-estatal.html>

<sup>15</sup> De la Fuente, Ángel, and Rafael Doménech. “El nivel educativo de la población en España y sus regiones: 1960-2011.” *Investigaciones Regionales – Journal of Regional Research*, 34. 2016. [http://www.aecr.org/images/ImatgesArticles/2016/5/04\\_DELAFUENTE.pdf](http://www.aecr.org/images/ImatgesArticles/2016/5/04_DELAFUENTE.pdf)

<sup>16</sup> The 1980 figure is from De la Fuente and Doménech, while the 2019 figure is from Eurostat. For further details, see: De la Fuente, Ángel, and Rafael Doménech. “El nivel educativo de la población en España y sus regiones: 1960-2011.” *Investigaciones Regionales – Journal of Regional Research*, 34. 2016. [http://www.aecr.org/images/ImatgesArticles/2016/5/04\\_DELAFUENTE.pdf](http://www.aecr.org/images/ImatgesArticles/2016/5/04_DELAFUENTE.pdf); y Eurostat. *Population by educational attainment level, sex and age (%) [edat\_lfs\_9903]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>17</sup> Updated figures for Spain have been provided by Felgueroso, Gutiérrez-Doménech and Jiménez-Martín. The EU-8 is constructed as the simple average of the values of the individual countries, and the EU-27 is the aggregate indicator reported by Eurostat. For more details on the construction of the EU-8, see the *Apunte metodológico* número I. For further details, see: Eurostat. *Early leavers from education and training by sex and labour status [edat\_lfse\_14]*. <https://ec.europa.eu/eurostat/data/database>; and Felgueroso, Florentino, María Gutiérrez-

Domènech, and Sergi Jiménez-Martín. “¿Por qué el abandono escolar se ha mantenido tan elevado en España en las últimas dos décadas? El papel de la Ley de Educación (LOGSE).” FEDEA, 2013. <https://documentos.fedea.net/pubs/ee/2013/02-2013.pdf>.

<sup>18</sup> Until 2003 the series in De la Fuente and Domenech (population over 25 years old) are used, and between 2004 and 2019 the Eurostat series (population between 25 and 74 years old) are used. For further details, see: De la Fuente, Ángel, and Rafael Doménech. “El nivel educativo de la población en España y sus regiones: 1960-2011.” *Investigaciones Regionales – Journal of Regional Research*, 34. 2016. [http://www.aecr.org/images/ImatgesArticles/2016/5/04\\_DELAFUENTE.pdf](http://www.aecr.org/images/ImatgesArticles/2016/5/04_DELAFUENTE.pdf); and Eurostat. *Population by educational attainment level, sex and age (%)* [edat\_lfs\_9903]. <https://ec.europa.eu/eurostat/data/database>.

<sup>19</sup> Department of Education and Vocational Training. *Publicaciones de la Estadística de la Educación en España Curso 1977-1978. Tasas de escolaridad, por edad y enseñanza*. Madrid: INE, 1980. [http://biblioteca-central.educacion.gob.es/record=b1200460~S0\\*sp](http://biblioteca-central.educacion.gob.es/record=b1200460~S0*sp).

<sup>20</sup> In 2018, Spain had an enrolment rate for the population under the age of 2 of 27% (EU-8: 17% and EU-27: 11%) and 60% for 2 year olds (EU-8: 56% and EU-27: 36%). The EU-8 is constructed as the simple average of the values of the individual reported countries, and the EU-27 is the aggregate indicator reported by Eurostat. For further information, see: Eurostat. *Pupils in early childhood and primary education by education level and age - as % of corresponding age population* [educ\_uoe\_enrp07]. <https://ec.europa.eu/eurostat/data/database>; and Department of Education and Vocational Training. *Escolarización y entorno educativo. Tasas de escolarización en las edades teóricas de los niveles no obligatorios. Pre-primary education*. Madrid, 2020. <https://www.educacionyfp.gob.es/inee/indicadores/sistema-estatal/mapa-indicadores.html>.

<sup>21</sup> In 2018, Spain had an enrolment rate for the 3-year-old population of 96% (EU-8: 87% and EU-27: 86%), 98% for the 4-year-old population (EU-8: 95% and EU-27: 93%) and 98% for the 5-year-old population (EU-8: 96% and EU-27: 94%). The EU-8 is constructed as the simple average of the values of the individual countries, and the EU-27 is the aggregate indicator reported by Eurostat. For further details, see: *Ibid*.

<sup>22</sup> On the importance of early education, see: Heckman, James J. “Schools, skills and synapses.” *Economic Inquiry* 46, n.º 3, 2008. <https://doi.org/10.1111/j.1465-7295.2008.00163.x>; and Cunha, Flavio, and James J. Heckman. “Formulating, Identifying and Estimating the Technology of Cognitive and Noncognitive Skill Formation.” *Journal of Human Resources* 43, n.º 4, 2008. <https://www.jstor.org/stable/40057370>. On the positive effect of early education on health, see: Campbell, Frances, *et al*. “Early Childhood Investments Substantially Boost Adult Health.” *Science* 343, n.º 6178, 2014. <https://science.sciencemag.org/content/343/6178/1478>.

<sup>23</sup> OECD. “How does access to early childhood services affect the participation of women in the labour market?”. *Education indicators in focus*. 2018. <https://www.oecd-ilibrary.org/docserver/232211ca-en.pdf?expires=1603983633&id=id&accname=guest&checksum=7B18F2602C83FA5E8D5DF681EE4E3464>.

<sup>24</sup> The EU-22 include all the EU-27 member countries that are also members of the OECD. This excludes Bulgaria, Croatia, Cyprus, Malta and Romania.

<sup>25</sup> The EU-8 average is constructed as the simple average of the values of the individual countries. For further details, see: OECD. *OECD Skills Outlook 2013. First results from the Survey of Adults Skills Figure 3.2 (L)*. Paris: OECD Publishing, 2013. [https://www.oecd.org/skills/piaac/Skills%20volume%201%20\(eng\)--full%20v12--eBook%20\(04%2011%202013\).pdf](https://www.oecd.org/skills/piaac/Skills%20volume%201%20(eng)--full%20v12--eBook%20(04%2011%202013).pdf).

<sup>26</sup> Thanks to the increase in school enrolment and the democratisation of degrees between 1985- 2005, the weight of social origin in the professional destiny of students has been reduced by 30%. In other words, thanks to education, social equality of opportunity has increased by 30%. For further details, see: Martínez-Celorrío, Xavier, and Antoni Marín Saldo. “Educación y movilidad social en España.” *Informe España 2012. Fundación Encuentro*. 2012. [https://www.fund-encuentro.org/informe\\_espana/indiceinforme.php?id=IE19](https://www.fund-encuentro.org/informe_espana/indiceinforme.php?id=IE19).

<sup>27</sup> The EU-8 and EU-27 are constructed as the simple average of the values of the individual countries. The EU-27 does not include Cyprus, Ireland, Malta, Poland and Romania due to lack of data availability. For further details, see: OECD. *PISA 2015 Results (Volume V): Collaborative Problem Solving. Figure V.4.7*. Paris: OECD Publishing, 2017. <https://doi.org/10.1787/9789264285521-en>.

<sup>28</sup> For further details, see: Echazarra, Alfonso, and Thomas Radinger. “Learning in rural schools: Insights from PISA, TALIS and the literature.” *OECD Education Working Papers*, n.º 196, Paris: OECD Publishing, 2019. [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/WKP\(2019\)4&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/WKP(2019)4&docLanguage=En); y Goerlich Gisbert, Francisco, and Ernest Reig Martínez (dirs.). *Las áreas urbanas funcionales en España. Economía y calidad de vida*. Bilbao: Fundación BBVA, 2020. [https://www.fbbva.es/wp-content/uploads/2020/06/DE2020\\_areas-urbanas-funcionales\\_ivie\\_web.pdf](https://www.fbbva.es/wp-content/uploads/2020/06/DE2020_areas-urbanas-funcionales_ivie_web.pdf).

<sup>29</sup> The EU-8 and EU-27 are constructed as the simple average of the values of the individual countries. The EU-27 does not include Cyprus due to lack of data. The data for Spain is taken from the document of the Department of Education and Vocational Training. For further details, see: Department of Education and Vocational Training. *PISA 2018 Resultados de lectura en España*. Madrid, 2020. <https://www.educacionyfp.gob.es/inee/evaluaciones-internacionales/pisa/pisa-2018/pisa-2018-informes-es.html>; and OECD. *PISA 2018 Results (Volume II). Where all students can succeed. Academic resilience*. Paris: OECD Publishing, 2019. <https://doi.org/10.1787/b5fd1b8f-en>.

<sup>30</sup> OIDEL, NOVAE and TERRAE. *Freedom of Education Index Worldwide Report 2016 on Freedom of Education*. 2018. [https://www.novaeterrae.eu/images/FEI\\_completo\\_Eng\\_Fra.pdf](https://www.novaeterrae.eu/images/FEI_completo_Eng_Fra.pdf).

<sup>31</sup> The EU-8 and the EU-27 are constructed as the simple average of the values of the individual countries. In the index of students' respect for people from other cultures, the EU-27 does not include the Czech Republic, Cyprus, Denmark, Luxembourg, Belgium, the Netherlands, Sweden and Finland due to lack of data availability. On the indicator of average performance in global competencies, the OECD is the aggregate reported by the institution itself. On the bullying indicator, the EU-22 include all the EU-27 member countries that are also members of the OECD. This excludes Bulgaria, Croatia, Cyprus, Malta and Romania. This variable is only available by parents' level of education and, in order to synthesise it into a single indicator, the average has been calculated. For further details, see: OECD. *Education at a glance 2020, Figura A6.2*. Paris: OECD Publishing, 2020. <https://doi.org/10.1787/69096873->

en; and Department of Education and Vocational Training. *PISA 2018 Competencia global, Figura 3.7a and Figura 6.1*. Madrid, 2020. <https://www.educacionyfp.gob.es/inee/evaluaciones-internacionales/pisa/pisa-2018/pisa-2018-informes-es.html>.

<sup>32</sup> Data from 2018. For further details, see: Ferrer, Álvaro. *Todo lo que debes saber de PISA 2018 sobre equidad*. Madrid, 2019. [https://www.savethechildren.es/sites/default/files/imce/dossier\\_pisa2018\\_espanadatos.pdf](https://www.savethechildren.es/sites/default/files/imce/dossier_pisa2018_espanadatos.pdf); and Department of Education and Vocational Training. *Sistema Estatal de Indicadores de la Educación 2020*. Madrid, 2020. <https://www.educacionyfp.gob.es/dam/jcr:7bd02364-3fd2-405f-b0d6-4fe05debbd38/seie-2020.pdf>.

<sup>33</sup> For further details, see: Jacob, Brian A., and Lars Lefgren. "The Effect of Grade Retention on High School Completion." *American Economic Journal: Applied Economics* 1, n°. 3, 2009. <https://www.jstor.org/stable/25760170?seq=1>; and OECD. *Education Policy Outlook Spain*. Paris: OECD Publishing, 2018. <https://www.educacionyfp.gob.es/dam/jcr:a4319a40-3163-42eb-a432-74dc95dbadb3/education-policy-outlook-country-profile-spain-2018.pdf>.

<sup>34</sup> European Commission. Communication of the Commission Europe 2020: the European Union strategy for growth and employment. COM(2010) 2020 final. Brussels, 2020. <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:ES:PDF>.

<sup>35</sup> This phenomenon affects mainly men. In 2019, the early school leaving rate in Spain was 21% for males and 13% for females. For further details, see: Eurostat. *Early leavers from education and training [edat\_lfse\_14]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>36</sup> This was especially the case after the 2008 crisis and the expansion of the construction industry, since before the crisis they were getting high-paying jobs and there was no lack of demand for labour. For further details, see: Serrano, Lorenzo, et al. "El abandono educativo temprano: análisis del caso español." *Instituto Valenciano de Investigaciones Económicas*, 2013. [http://web2016.ivie.es/wp-content/uploads/2017/06/Informe\\_Abandono\\_Educativo\\_Temprano.pdf](http://web2016.ivie.es/wp-content/uploads/2017/06/Informe_Abandono_Educativo_Temprano.pdf).

<sup>37</sup> The EU-8 is constructed as the simple average of the values of the individual countries, and the EU-27 is the aggregate indicator reported by Eurostat. For further details, see: Eurostat. *Early leavers from education and training [edat\_lfse\_14]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>38</sup> The figure is from 2019. For further details, see: INE. *Encuesta de población activa. Activos por nivel de formación alcanzado, sexo y grupo de edad*. <https://www.ine.es/dynt3/inebase/es/index.htm?padre=811&capsel=813>.

<sup>39</sup> This means that they have only primary or secondary general education (compulsory secondary education and Bachillerato).

<sup>40</sup> Note that Spain's educational structure has an "hourglass" shape as opposed to the "barrel" shape of other European states, which seems to be better aligned with the requirements of the productive system. The EU-8 is constructed as the simple average of the values for each of its countries and the EU-27 and the OECD are the aggregate indicators reported by Eurostat and the OECD respectively. For further details, see: Eurostat. *Population by educational attainment level, sex and age (%) - main indicators [edat\_lfse\_03]*. <https://ec.europa.eu/eurostat/data/>

database; and OCDE. *Educational attainment and labour-force status*. <https://stats.oecd.org/>.

<sup>41</sup> The chapter uses PISA for the comparison of learning levels, as it is the most robust source at present. In the future, as other studies such as the Estudio Internacional de Tendencias en Matemáticas y Ciencias (TIMSS, *Trends in International Mathematics and Science Study* (TIMSS)), the Estudio Internacional para el Progreso de la Comprensión Lectora (PIRLS, *Progress in International Reading Literacy Study*), or other diagnostic assessments are available and sufficiently reliable, it would be interesting to incorporate them into the analysis. For further details, see: TIMSS & PIRLS International Study Center, <https://timssandpirls.bc.edu/>.

<sup>42</sup> For example, students with disabilities that prevented them from filling in the test booklets or those students who did not have a full year of schooling in Spain and did not have a sufficient command of the language of the test. For further details, see: Department of Education and Vocational Training. *PISA 2003. Matemáticas. Informe español*. Madrid, 2008. <https://www.educacionyfp.gob.es/inee/dam/jcr:e33efca0-7c9b-4039-975f-c6875bcc36b0/pisa2003mat.pdf>.

<sup>43</sup> The EU-8 is constructed as the simple average of the values for each of its countries and does not include Finland due to lack of data availability. The OECD average is the aggregate indicator reported by the institution itself. For further details, see: OECD. *PISA 2015 Results (Volume I): Excellence and Equity in Education. Figure I.7.1*. Paris: OECD Publishing, 2016. <https://doi.org/10.1787/9789264266490-en>.

<sup>44</sup> The EU-8 and EU-22 are constructed as the simple average of the values of the individual countries. The EU-22 consists of the EU-27 member countries that are also members of the OECD, which excludes Bulgaria, Croatia, Cyprus, Malta and Romania. For further details, see: OECD. *PISA 2018 Results (Volume I): What Students Know and Can Do. Annex A2 Results for countries and economies. Change in the enrollment of 15-year-olds in grade 7 and above (PISA 2003 through PISA 2018) [coverage index 3. coverage of the national 15-year-old population]*. <https://doi.org/10.1787/5f07c754-en>.

<sup>45</sup> It is worth noting that many high-performing EU and OECD countries (such as Australia, Canada, Ireland, Belgium, Finland, South Korea or New Zealand) have experienced declines in learning, even larger than Spain, since 2009, which explains the decline in the OECD, EU-22 and EU-8 over the last decade. For further details, see: OECD. *Education at a Glance 2020*. Paris: OECD Publishing, 2020. <http://www.oecd.org/education/education-at-a-glance-19991487.htm?refcode=20190209ig>.

<sup>46</sup> The EU-8 and EU-22 are constructed as the simple average of the values of the individual countries. The EU-22 consists of the EU-27 member countries that are also members of the OECD, which excludes Bulgaria, Croatia, Cyprus, Malta and Romania. The OECD average is the aggregate indicator reported by the institution itself and refers specifically to the OECD-23, which does not include Austria, Chile, Colombia, Estonia, Israel, Lithuania, Slovenia, Luxembourg, the Netherlands, Slovakia, Spain, Turkey, the United Kingdom and the United States. Estonia is the EU-27 country that scored the best in 2018 and Bulgaria, the one that scored the worst. The 2018 figure for Spain is obtained from the Department of Education and Vocational Training (2019). For further details, see: Department of Education and Vocational Training. *PISA 2018*. Madrid, 2019. [472 Spain 2050 ■ At the forefront of education](https://sede.</a></p></div><div data-bbox=)



educacion.gob.es/publivena/pisa-2018-programa-para-la-evaluacion-internacional-de-los-estudiantes-informe-espanol/evaluacion-examenes/23505; Department of Education and Vocational Training. PISA 2018 Resultados de lectura en España. Madrid, 2020. <https://www.educacionyfp.gob.es/inee/evaluaciones-internacionales/pisa/pisa-2018/pisa-2018-informes-es.html>; and OECD. PISA 2018 Results (Volume I): What Students Know and Can Do. Annex B1 Results for countries and economies. Mean reading performance, 2003 through 2018. <https://doi.org/10.1787/5f07c754-en>.

<sup>47</sup> The EU-8 and EU-22 are constructed as the simple average of the values of the individual countries. The EU-22 consists of the EU-27 member countries that are also members of the OECD, which excludes Bulgaria, Croatia, Cyprus, Malta and Romania. The OECD average is the aggregate indicator reported by the institution itself and refers specifically to the OECD-29 which does not include Austria, Chile, Colombia, Estonia, Israel, Lithuania, Slovenia and the United Kingdom. Estonia is the EU-27 country that scored the best in 2018 and Bulgaria, the one that scored the worst. For further details, see: OECD. PISA 2018 Results (Volume I): What Students Know and Can Do. Annex B1 Results for countries and economies. Mean mathematics performance, 2003 through 2018. <https://doi.org/10.1787/5f07c754-en>.

<sup>48</sup> The EU-8 and EU-22 are constructed as the simple average of the values of the individual countries. The EU-22 consists of the EU-27 member countries that are also members of the OECD, which excludes Bulgaria, Croatia, Cyprus, Malta and Romania. The OECD average is the aggregate indicator reported by the institution itself and refers specifically to the OECD-36 which does not include Austria. Estonia is the EU-27 country that scored the best in 2018 and Bulgaria, the one that scored the worst. For further details, see: OECD. PISA 2018 Results (Volume I): What Students Know and Can Do. Annex B1 Results for countries and economies. Mean science performance, 2006 through 2018. <https://doi.org/10.1787/5f07c754-en>.

<sup>49</sup> The EU-8 and EU-22 are constructed as the simple average of the values of the individual reported countries, and the average of the OECD is the aggregate indicator reported by the same institution. The EU-27 does not include Ireland and Poland due to lack of data. Estonia is the EU-27 country that scored the best and Bulgaria, the one that scored the worst. For further details, see: Mo, Jeffrey. Collaborative Problem Solving. PISA in Focus, n° 78, Paris: OECD Publishing, 2017. <https://doi.org/10.1787/cdae6d2e-en>; and OECD. PISA 2018 Results (Volume IV): Are students smart about money? Paris: OECD Publishing, 2020. [https://www.oecd-ilibrary.org/education/pisa-2018-results-volume-iv\\_48ebd1ba-en](https://www.oecd-ilibrary.org/education/pisa-2018-results-volume-iv_48ebd1ba-en).

<sup>50</sup> With regard to PISA results, see: OECD. Education at a Glance 2020. Paris: OECD Publishing, 2020. <http://www.oecd.org/education/education-at-a-glance-19991487.htm?refcode=20190209ig>. We found similar results when we looked at other international tests. For example, TIMSS (mathematics and science) and PIRLS (reading). In science, the proportion of students with an advanced level is 2 percentage points (pp) lower than the EU-8 (5% and 7%, respectively) and the proportion of students with a high level is 3 pp lower (34% and 37%, respectively). In mathematics, the proportion of students with an advanced level is 4 pp lower than the EU-8 (3% and 7%, respectively) and the proportion of students with a high level is 10 pp lower (27% and 37%, respectively). In reading comprehension, the proportion of students with an advanced level is 4 pp lower than in the EU-8 (6% and

10%, respectively) and the proportion of students with a high level is 7 pp lower (39% and 46%, respectively). For further details, see, among others: Martin, Michael O., et al. TIMSS 2015 International Results in Science. TIMSS & PIRLS International Study Center. Massachusetts: Boston College, 2015. <https://www.educacionyfp.gob.es/inee/dam/jcr:7bfa71d4-bef3-4efc-9bd3-a0db51dd3861/timss2015-international-results-in-science.pdf>; Mullis, Ina V. S., et al. TIMSS 2015 International Results in Mathematics. TIMSS & PIRLS International Study Center. Massachusetts: Boston College, 2016. <https://www.educacionyfp.gob.es/inee/dam/jcr:e650c54d-2315-4467-8edc-e32b0643527b/timss2015-international-results-in-mathematics.pdf>; and Mullis, Ina V.S., et al. PIRLS 2016 International Results in Reading. TIMSS & PIRLS International Study Center. Massachusetts: Boston College, 2017. <https://www.educacionyfp.gob.es/inee/dam/jcr:16027373-dfd0-4005-a318-6f6d5d040a81/INFORME%20INTERNACIONAL%20PIRLS%202016.pdf>.

<sup>51</sup> School segregation is defined as the deviations or differences between the composition of schools and the composition of the environment in which they are located. The profile can be socio-economic, academic or "ethnic".

<sup>52</sup> For further details, see: Herrera Sosa, Katia Marina, et al. "Education in the EU: diverging learning opportunities? - an analysis of a decade and a half of skills using the Program for International Student Assessment (PISA) in the European Union (English)." Washington, D.C.: World Bank Group, 2018. <http://documents.worldbank.org/curated/en/894191528957211270/Education-in-the-EU-diverging-learning-opportunities-an-analysis-of-a-decade-and-a-half-of-skills-using-the-Program-for-International-Student-Assessment-PISA-in-the-European-Union>

<sup>53</sup> Ferrer, Álvaro. Todo lo que debes saber de PISA 2018 sobre equidad. Madrid, 2019. [https://www.savethechildren.es/sites/default/files/imce/dossier\\_pisa2018\\_espanadatos.pdf](https://www.savethechildren.es/sites/default/files/imce/dossier_pisa2018_espanadatos.pdf)

<sup>54</sup> Data from 2015. The EU-22 excludes Sweden, Denmark and Finland due to data availability. For further details, see: Fernández Enguita, Mariano, Luis Mena Martínez, and Jaime Riviere Gómez. "Fracaso y abandono escolar en España." Fundación la Caixa, 2010. <http://gidid.unizar.es/viejo/chen/chaime/asigna/sistemasbienestar/textos/ENGUITA-2010.pdf>; Gortazar, Lucas. "¿Favorece el sistema educativo español la igualdad de oportunidades?" ICE, Economía de la Educación y Política Educativa, n.º 910, 2019. <http://www.revistasice.com/index.php/ICE/article/view/6917/6936>; Herrera Sosa, Katia Marina, et al. "Education in the EU: diverging learning opportunities? - an analysis of a decade and a half of skills using the Program for International Student Assessment (PISA) in the European Union (English)." Washington, D.C.: World Bank Group, 2018. <http://documents.worldbank.org/curated/en/894191528957211270/Education-in-the-EU-diverging-learning-opportunities-an-analysis-of-a-decade-and-a-half-of-skills-using-the-Program-for-International-Student-Assessment-PISA-in-the-European-Union>; and OECD. PISA 2015 Results (Volume I): Excellence and Equity in Education. Paris: OECD Publishing, 2019. <https://www.oecd.org/education/pisa-2015-results-volume-i-9789264266490-en.htm>.

<sup>55</sup> Between 2006 and 2018, socio-economic school segregation in Spain (measured using the Gorard Index) has risen from 0.28 to 0.3. In 2018, the EU-8 and EU-22 averages were 0.28 and 0.29, respectively. The Gorard index shows the difference between the weight of a minority



group (in this case the most vulnerable students, defined as the 25% with the lowest social background) and the total members of the group (the whole student body). In simpler terms, this index shows the proportion of children who would need to transfer to other schools to desegregate the territory. In our country, school segregation is closely associated with residential segregation, the existence of the dual public-private network and the planning and admission policies for educational provision. At a regional level, it is quite heterogeneous and in some autonomous communities, such as Andalusia, the Basque Country and especially Madrid, it has increased in recent years. On this question, see: Ferrer, Álvaro. *Todo lo que debes saber de PISA 2018 sobre equidad*. Madrid, 2019. [https://www.savethechildren.es/sites/default/files/imce/dossier\\_pisa2018\\_espanadatos.pdf](https://www.savethechildren.es/sites/default/files/imce/dossier_pisa2018_espanadatos.pdf); and Ferrer, Álvaro and Lucía Martínez. “Mézcate conmigo. De la segregación socioeconómica a la educación inclusiva.” *Save the Children*. Madrid, 2019. [https://www.savethechildren.es/sites/default/files/imce/docs/mezclate\\_conmigo.pdf](https://www.savethechildren.es/sites/default/files/imce/docs/mezclate_conmigo.pdf).

<sup>56</sup> At equal proficiency in mathematics and science, the *odds ratio* (depicted in the graph) is the ratio between the probability of repeating an academic year for a student in the lowest quartile by socio-economic level and the highest quartile by socio-economic level. The EU-8 and EU-22 are constructed as the simple average of the values of the individual countries. The EU-22 consists of the EU-27 member countries that are also members of the OECD, which excludes Bulgaria, Croatia, Cyprus, Malta and Romania. The OECD average is the aggregate indicator reported by the institution itself. For further details, see: Ferrer, Álvaro. *Todo lo que debes saber de PISA 2018 sobre equidad*. Madrid, 2019. [https://www.savethechildren.es/sites/default/files/imce/dossier\\_pisa2018\\_espanadatos.pdf](https://www.savethechildren.es/sites/default/files/imce/dossier_pisa2018_espanadatos.pdf).

<sup>57</sup> Educational mobility is approximated by the ratio between the number of years of schooling of parents and children. The higher the association, the lower the educational mobility. The EU-8 is constructed as the simple average of the values of the individual reported countries, but does not include Austria due to lack of data availability. The OECD average is the aggregate indicator reported by the institution itself and refers specifically to the OECD-29 which does not include Austria, Chile, Colombia, Estonia, Israel, Lithuania, Slovenia and the United Kingdom. For further details, see Fig. 5.13. *Intergenerational educational persistence* en: OECD. *A Broken Social Elevator? How to Promote Social Mobility*. Paris: OECD Publishing, 2018. <https://doi.org/10.1787/9789264301085-en>.

<sup>58</sup> OECD. *Education at a Glance 2020*. Paris: OECD Publishing, 2019. <http://www.oecd.org/education/education-at-a-glance-19991487.htm/?refcode=20190209ig>.

<sup>59</sup> For further details, see: Fernández Enguita, Mariano. “‘Y, si no te gusta, te aguantas.’ En torno a algunos indicadores del malestar del alumnado.” *Indicadores comentados sobre el estado del sistema educativo español*. Fundación Ramón Areces. Madrid, 2018. <https://www.fundacionareces.es/recursos/doc/porta/2018/03/20/indicadores-comentados-sobre-el-estado-del-sistema-educativo-espanol-2018.pdf>; World Health Organization. *Spotlight on adolescent health and well-being. Findings from the 2017/2018 Health Behaviour in School-aged Children (HBSC) survey in Europe and Canada. International report. Vol. 1. Key findings*. Copenhagen: WHO Regional Office for Europe, 2020. <https://apps.who.int/iris/bitstream/handle/10665/332091/9789289055000-eng.pdf>.

<sup>60</sup> The EU-22 is constructed as the simple average of the values of the individual countries. For further details, see: World Health Organisation. *Health Behaviour in School-aged Children. Proportion of young people who like school a lot [HBSC\_42]*. <https://gateway.euro.who.int/en/datasets/hbsc/>.

<sup>61</sup> For further details, see: Aparicio-Fenoll, Ainhoa. “Returns to Education and Educational Outcomes: *The Case of the Spanish Housing Boom*”, *Journal of Human Capital* 10, n.º 2, 2016. <https://doi.org/10.1086/686154>; and Lacuesta, Aitor, Sergio Puente, and Ernesto Villanueva. “The schooling response to a sustained increase in low-skill wages: evidence from Spain 1989-2009.” *SERIEs* 11, 2020. <https://doi.org/10.1007/s13209-020-00218-0>.

<sup>62</sup> For further details, see: Official State Gazette. *Ley Orgánica 2/2006, de 3 de mayo de, Educación (LOE)*. Madrid, 2006. <https://www.boe.es/buscar/pdf/2006/BOE-A-2006-7899-consolidado.pdf>; Official State Gazette. *Ley Orgánica 8/2013, de 9 de diciembre, para la Mejora de la Calidad Educativa (LOMCE)*. Madrid, 2013. <https://www.boe.es/eli/es/lo/2013/12/09/8>; and Official State Gazette. *Ley Orgánica 3/2020, de 29 de diciembre de, por la que se modifica la Ley Orgánica 2/2006, de 3 de mayo, de Educación*. Madrid, 2020. <https://www.boe.es/boe/dias/2020/12/30/pdfs/BOE-A-2020-17264.pdf>.

<sup>63</sup> OECD. *PISA 2015 Results (Volume V): Collaborative Problem Solving, PISA*. Paris: OECD Publishing, 2017. <https://doi.org/10.1787/9789264285521-en>.

<sup>64</sup> Overall, the effect of teacher quality (“having a good teacher”) on student learning is quite important. Academic research focuses on the ‘added value’ that a particular teacher has on educational outcomes. That is, controlling for student characteristics (e.g. socio-economic status or previous grades), and contextual characteristics (e.g. school, class), they identify what is the causal improvement in learning from having a particular teacher. For example, evidence for the USA shows that increasing a teacher’s added value in a standard deviation (i.e. the difference between an average teacher and one at the 84th percentile of the distribution) accounts for between 0.1 and 0.2 of a standard deviation of cognitive improvement for students. In addition, a good teacher improves students’ non-cognitive performance (reduces absences and repetition), which are good predictors of essential variables such as successfully completing high school or taking the university entrance exam. See: Jackson, C. Kirabo, Jonah E. Rockoff, and Douglas O. Staiger. “Teacher effects and teacher-related policies.” *Annual Review of Economics* 6, 2014. <https://doi.org/10.1146/annurev-economics-080213-040845>; and Jackson, C. Kirabo. “What do test scores miss? The importance of teacher effects on non-test score outcomes.” *Journal of Political Economy* 126, n.º 5, 2018. <https://doi.org/10.1086/699018>. For further details, also refer to: Calero, Jorge, and J. Oriol Escardíbul. “Teacher quality and student skill acquisition. An analysis based on PIRLS-2011 outcomes.” *Journal of Educational studies*, 2019. <https://doi.org/10.1080/03055698.2019.1628710>; Hargreaves, Andy, and Michael Fullan. *Professional Capital: Transforming Teaching in Every School*. New York: Teachers College Press, 2012; y Jackson, C. Kirabo, and Elías Bruegmann. “Teaching Students and Teaching Each Other: The Importance of Peer Learning for Teachers.” *American Economic Journal: Applied Economics* 1, n.º 4, 2009. <https://www.jstor.org/stable/25760183?seq=1>.

<sup>65</sup> Colectivo Lorenzo Luzuriaga. *Logros, problemas y retos del Sistema*

Educativo Español: La formación del profesorado. 2014. <http://www.colectivolorenzoluzuriaga.com/PDF/FORMACION%20DEL%20PROFESORADO.pdf>.

<sup>66</sup> Manso, Jesús, and José Moya (coord.). *Profesión y profesionalidad docente: Una acción educativa comprometida con el desarrollo humano*. Red por el Diálogo Educativo, 2019. [https://www.dialogorede.es/wp-content/uploads/2019/04/LIBRO\\_PROFESION\\_DOCENTE.pdf](https://www.dialogorede.es/wp-content/uploads/2019/04/LIBRO_PROFESION_DOCENTE.pdf).

<sup>67</sup> For instance, for the case of Finland, see: García Perales, Nuria, and Miguel A. Martín Sánchez. "Algunas notas en perspectiva comparada sobre formación de maestros: el caso de España y de Finlandia." *Tejuelo* 13, 2012. <https://dialnet.unirioja.es/servlet/articulo?codigo=3804433>; Melgarejo Draper, Javier. "La selección y formación del profesorado: clave para comprender el excelente nivel de competencia lectora de los alumnos finlandeses." *Revista de Educación*, n.º 13, 2006. <http://www.educacionyfp.gob.es/dam/jcr:36aab44a-2675-4abd-9ab0-99460cc664b7/re200614-pdf.pdf>; and Saavedra, Jaime, Hanna Alasuutari and Marcela Gutiérrez. "Los maestros y la confianza, los pilares del sistema educativo de Finlandia." *World Bank Blogs*, 2019. <https://blogs.worldbank.org/es/education/los-maestros-y-la-confianza-los-pilares-del-sistema-educativo-de-finlandia>. For instance, for the case of Japan, see: Ramírez Carpeño, Eva, and Yoko Mekochi. "Initial teacher education in Japan and Spain. A comparative study." *Revista Española de Educación Comparada* 25, 2015. <http://revistas.uned.es/index.php/REEC/article/view/14786/13159>.

<sup>68</sup> Admission marks for undergraduate degrees of newly admitted students in on-site public universities. For further details, see: Department of Universities. *Datos y cifras del Sistema Universitario Español - Publicación 2019-2020*. Madrid, 2020. [https://www.ciencia.gob.es/stfls/MICINN/Universidades/Ficheros/Estadisticas/Informe\\_Datos\\_Cifras\\_Sistema\\_Universitario\\_Espanol\\_2019-2020.pdf](https://www.ciencia.gob.es/stfls/MICINN/Universidades/Ficheros/Estadisticas/Informe_Datos_Cifras_Sistema_Universitario_Espanol_2019-2020.pdf).

<sup>69</sup> In the case of "the best teachers receive recognition from their peers", the reference year is 2013. The OECD average is the aggregate indicator reported by the institution itself. For further details, see: OECD. *TALIS 2018 Results (Volume I): Teachers and School Leaders as Lifelong Learners*. Paris: OECD Publishing, 2019. <https://doi.org/10.1787/1d0bc92a-en>; and OECD. *TALIS 2018 Results (Volume II): Teachers and School Leaders as Valued Professionals*. Paris: OECD Publishing, 2020. <https://doi.org/10.1787/19cf08df-en>.

<sup>70</sup> The "extra" effect of a "good" teacher on the results of a student from a disadvantaged background is greater than for a student from a favourable socio-economic background who, irrespective of teacher quality, has other tools and resources at his or her disposal to progress. In other words, the importance of teachers is key for both students from favourable and vulnerable backgrounds, but is higher in the latter case. For further details, see: Calero, Jorge, and J. Oriol Escardíbul. "Teacher quality and student skill acquisition. An analysis based on PIRLS-2011 outcomes." *Journal of Educational studies*, 2019. <https://doi.org/10.1080/03055698.2019.1628710>; and López Rupérez, Francisco, Isabel García García, and Eva Expósito Casas. *Liderazgo de la dirección y feedback formativo: Dos pilares básicos de la gobernanza escolar*. Centro de Enseñanza Universitaria Sek, 2019.

<sup>71</sup> De Puelles Benítez, Manuel. "Reflexiones sobre cuarenta años de educación en España o la irresistible seducción de las leyes." *Historia y Memoria de la Educación*, n.º 3, 2016. <https://dialnet.unirioja.es/servlet/articulo?codigo=5455665>.

<sup>72</sup> León, Sandra, and Mónica Ferrín Pereira. "Intergovernmental Cooperation in a Decentralized System: the Sectoral Conferences in Spain." *South European Society and Politics* 16, n.º 4, 2011. <https://doi.org/10.1080/13608746.2011.602849>.

<sup>73</sup> In Spain, only 24% of school leaders have significant responsibility for school tasks (both pedagogical and resource management), compared to 63% in the OECD as a whole. According to research by Hanushek, Link, and Woessmann, school autonomy is a key determinant of educational performance, especially in some dimensions such as academic content design and staff management. For further details, see: Hanushek, Eric A., Susanne Link, and Ludger Woessmann. "Does school autonomy make sense everywhere? Panel estimates from PISA." *Journal of Development Economics* 104, 2013, <https://doi.org/10.1016/j.jdeveco.2012.08.002>; OECD. *Education Policy Outlook*. Spain. 2018. <http://www.oecd.org/education/Education-Policy-Outlook-Country-Profile-Spain-2018.pdf>; OECD. *TALIS 2018 Results (Volume I): Teachers and School Leaders as Lifelong Learners*. Paris: OECD Publishing, 2019. <https://doi.org/10.1787/1d0bc92a-en>; and OECD. *TALIS 2018 Results (Volume II): Teachers and School Leaders as Valued Professionals*. Paris: OECD Publishing, 2020. <https://doi.org/10.1787/19cf08df-en>.

<sup>74</sup> Bolívar Botía, Antonio. "Políticas de gestión escolar desde una perspectiva comparada: la excepción ibérica." *ICE, Economía de la Educación y Política Educativa*, n.º 910, 2019. <http://www.revistasice.com/index.php/ICE/article/view/6916/6937>.

<sup>75</sup> In fact, literature shows that, in European and OECD countries, greater school autonomy is associated with better outcomes for the education system. For further details, see: Balázs, Égert, Jarmila Botev, and David Turner. "The Contribution of Human Capital and Its Policies to per Capita Income in Europe and the OECD." *European Economic Review* 129, 2020. <https://doi.org/10.1016/j.euroecorev.2020.103560>.

<sup>76</sup> Pritchett, Lant. "Creating Education Systems Coherent for Learning Outcomes: Making the Transition from Schooling to Learning." *Research on improving systems of education Working Papers*, n.º 15/005, 2015. [https://riseprogramme.org/sites/default/files/inline-files/RISE\\_WP-005\\_Pritchett\\_1.pdf](https://riseprogramme.org/sites/default/files/inline-files/RISE_WP-005_Pritchett_1.pdf).

<sup>77</sup> The OECD average is the aggregate indicator reported by the institution itself. For further details, see: OECD. *Education at a Glance 2018. Percentage of decisions taken at each level of government in public lower secondary education, by domain [Table D6.2]*. Paris: OECD Publishing, 2019. <https://doi.org/10.1787/eag-2018-en>.

<sup>78</sup> López Rupérez, Francisco, Isabel García García, and Eva Expósito Casas. *La calidad de la gobernanza del sistema educativo español. Un estudio empírico*. Universidad Camilo José Cela, 2017. [https://www.ucj.edu/wp-content/uploads/Gobernanza\\_Digital.pdf](https://www.ucj.edu/wp-content/uploads/Gobernanza_Digital.pdf).

<sup>79</sup> Roldán, Toni, and Antonio Cabrales. "Dos acuerdos educativos para la legislatura: una propuesta transversal." *EsadeEcPol - Center for Economic Policy & Political Economy*, 2020. [https://www.esade.edu/itemsweb/wi/research/ecpol/EsadeEcPol\\_policybrief1.pdf](https://www.esade.edu/itemsweb/wi/research/ecpol/EsadeEcPol_policybrief1.pdf).

<sup>80</sup> Red por el Diálogo Educativo. "Hacia un nuevo modelo de evaluación, responsabilidad y mejora educativa." *Cuadernos de pedagogía*, n.º 504. 2019 <https://dialnet.unirioja.es/servlet/articulo?codigo=7192409>.

<sup>81</sup> For further details, see: De la Rica, Sara, Lucas Gortazar, and Ainhoa Vega Bayo. "Análisis de los resultados de aprendizaje del sistema."

Fundación ISEAK, 2019. <https://iseak.eu/documentos/analisis-de-los-resultados-de-aprendizaje-del-sistema-educativo-vasco/>; y Marcenero-Gutiérrez, Oscar, and Anna Vignoles. “A comparison of teacher and test-based assessment for Spanish primary and secondary students.” *Journal of Educational Research* 57, n.º 1, 2015. <https://www.tandfonline.com/doi/abs/10.1080/00131881.2014.983720>.

<sup>82</sup> Marina, J. Antonio, Carmen Pellicer, and Jesús Manso. *Libro blanco de la profesión docente y su entorno escolar*. Fundación Ciudadanía y Valores, 2015. <http://www.funciva.org/wp-content/uploads/2016/11/Libro-blanco-de-la-profesi%C3%B3n-docente.pdf>.

<sup>83</sup> Álvarez López, Gabriel. “La evaluación de la educación básica en el sistema educativo español: Estudio comparado en el ámbito de las Comunidades Autónomas.” *Universidad Autónoma de Madrid*, 2017. <https://repositorio.uam.es/handle/10486/679872>.

<sup>84</sup> Between 1977 and 2000, public spending on education as a percentage of GDP increased from 2.1% to 4.2% (the latter, similar to the level observed in 2017). For further details, see: UNESCO. *Government expenditure on education as a percentage of GDP (%)*. <http://data.uis.unesco.org/#>.

<sup>85</sup> Several factors could explain this figure: the lower importance that Spain attaches to education compared to other EU-8 countries; the inability to create a political consensus that guarantees a sustained increase in education spending; or the smaller size of the public education sector in Spain and the higher private spending by households (double the EU-22 average). This last fact is associated with the notable weight that the subsidised model has in our country, accounting for 25% of the education system. Para más detalles, véase: OECD. *Education at a Glance 2018*. Paris: OECD Publishing, 2018. <https://doi.org/10.1787/eag-2018-en>; Pérez García, Francisco, and Ezequiel Uriel Jiménez. “Cuentas de la educación en España, 2000-2013: Recursos, gastos y resultados.” *Fundación BBVA*, 2016. [https://www.fbbva.es/wp-content/uploads/2017/07/DE\\_2016\\_IVIE\\_Cuentas\\_de\\_la\\_educacion.pdf](https://www.fbbva.es/wp-content/uploads/2017/07/DE_2016_IVIE_Cuentas_de_la_educacion.pdf); and Gortazar, Lucas (coord.). *La financiación del sistema educativo: invertir en calidad, equidad e inclusión*. Red por el Diálogo Educativo y Asociación Nacional de Editores de Libros y material de Enseñanza, 2020. <https://www.dialogorede.es/wp-content/uploads/2020/12/3-libro-financiacion.pdf>.

<sup>86</sup> Public expenditure on education includes both expenditure on pre-primary, primary and secondary education and expenditure on post-compulsory education (bachillerato, vocational training and university). In 2018 (latest year available), pre-primary, primary and secondary education accounted for around 60% of total public spending on education in our country. Between 1977 and 1994, for the case of Spain, the UNESCO time series has been used, while since 1995 (the first year available) the series of the Department of Education and Vocational Training has been used. The EU-8 and EU-27 are constructed as the simple average of the values of the individual countries and include all the available data for each year. For further details, see: Department of Education and Vocational Training. *Gasto Público en educación en relación al P.I.B. por cobertura económica, tipo de administración y periodo*. <https://www.educacionyfp.gob.es/servicios-al-ciudadano/estadisticas/recursos-economicos/gasto-publico/series-2018-dp.html>; and UNESCO. *Government expenditure on education as a percentage of GDP (%)*. <http://data.uis.unesco.org/#>.

<sup>87</sup> Data in constant Purchasing Power Parity (PPP) prices. PPP makes

it possible to compare income levels between countries, taking into account differences in the cost of living. The EU-8 is constructed as the simple average of the values of the individual reported countries, and the EU-27 is the aggregate indicator reported by Eurostat. For further information, see: Eurostat. *Public expenditure on education per pupil/student based on FTE by education level and programme orientation [educ\_uoe\_fine09]*. <https://ec.europa.eu/eurostat/data/database>; and OCDE. *Purchasing power parities*. <https://data.oecd.org/conversion/purchasing-power-parities-ppp.htm>.

<sup>88</sup> In 2016, the percentage of education expenditure on capital goods in Spain was 3% of the total in primary and secondary education, while in the OECD and EU-22 it was 7%. For further details, see: OECD. *Education at a glance 2019. Table C6.1. Share of current and capital expenditure*. Paris: OECD Publishing, 2019. <https://doi.org/10.1787/f8d7880d-en>.

<sup>89</sup> Gortazar, Lucas (coord.). *La financiación del sistema educativo: invertir en calidad, equidad e inclusión*. Red por el Diálogo Educativo y Asociación Nacional de Editores de Libros y material de Enseñanza, 2020. <https://www.dialogorede.es/wp-content/uploads/2020/12/3-libro-financiacion.pdf>.

<sup>90</sup> The digitalisation of the education sector, which has been progressing over the last decade, helped to reduce the negative effect of confinement, providing schools and teachers with equipment and allowing teaching to continue remotely. Without these resources, the learning loss would have been more pronounced. In general, households also did their best to support and monitor their children’s school work. However, the absence or scarcity of technological resources, which affects the most disadvantaged Spanish households, made it almost impossible for many children and adolescents to continue their education remotely. On this issue, see: Fernández Enguita, Mariano. “Una pandemia imprevisible ha traído la brecha previsible.” *Cuaderno de campo*, <https://blog.enguita.info/2020/03/una-pandemia-imprevisible-ha-traido-la.html>; Moreno, J. Manuel, and Lucas Gortazar. “Preparación de las escuelas para el aprendizaje digital, en opinión de los directores. Un análisis de PISA 2018 y sus implicaciones para la respuesta a la crisis del COVID-19.” *World Bank Blogs*, 2020. <https://blogs.worldbank.org/es/education/schools-readiness-digital-learning-eyes-principals-analysis-pisa-2018-and-its>; and Zubillaga, Ainara, and Lucas Gortazar. *COVID-19 y educación I: problemas, respuestas y escenarios*. Fundación COTEC, 2020. <https://online.flippingbook.com/view/967738/>.

<sup>91</sup> Bonal, Xavier, and Sheila González Motos. “Proyecto - Desigualdades de aprendizaje en el confinamiento.” *UAB blog*, 2020. <https://blogs.uab.cat/aprenentatgeiconfinament/es/equip/>. Similar data on activity, communication and distance learning gaps have been found in studies carried out in other countries, e.g. the Netherlands, Belgium, the UK and the US. For further details, see: Andrew, Alison, *et al.* “Learning during the lockdown: real-time data on children’s experiences during home learning.” *Institute for Fiscal Studies*, 2020. <https://www.ifs.org.uk/publications/14848>; Bacher-Hicks, Andrew, Joshua Goodman, and Christine Mulhern. “Inequality in household adaptation to schooling shocks: Covid-induced online learning engagement in real time.” *Journal of Public Economics* 193, 2021. <https://doi.org/10.1016/j.jpubeco.2020.104345>; Bol, Thijs. “Inequality in homeschooling during the Corona crisis in the Netherlands. First results from the LISS Panel.” *SocArXiv Papers*, 2020. <https://osf.io/preprints/socarxiv/hf32q/>; Engzell, Per, Arun Frey, and Mark Verhagen. “Learning Loss Due to School

Closures During the COVID-19 Pandemic.” *SocArXiv Papers*, 2020. <https://osf.io/preprints/socarxiv/ve4z7/>; and Maldonado, Joana Elisa, and Kristof De Witte. “The effect of school closures on standardised student test outcomes.” *Discussion Paper Series*, n.º DPS20.17, 2020. <https://lirias.kuleuven.be/3189074?limo=0>.

<sup>92</sup> Authors' own, based on PISA 2018 data. For further details, see: OECD. *PISA 2018*. <https://www.oecd.org/pisa/>.

<sup>93</sup> Authors' own, based on PISA 2018 data. The EU-8 and EU-22 are constructed as the simple average of the values of the individual countries. The EU-22 consists of the EU-27 member countries that are also members of the OECD, which excludes Bulgaria, Croatia, Cyprus, Malta and Romania. For further details, see: OECD. *PISA 2018*. <https://www.oecd.org/pisa/>.

<sup>94</sup> Data until 29 March 2021. The EU-8 and EU-27 are constructed as the simple average of the values of the individual countries. For further details, see: UNESCO. “Total duration of school closures.” UNESCO, <https://en.unesco.org/covid19/educationresponse#schoolclosures>.

<sup>95</sup> For further details, see: Hanushek, Eric A., and Ludger Woessmann. “The Economic Impacts of Learning Losses.” *Paris: OECD Publishing*, 2020. <https://www.oecd.org/education/The-economic-impacts-of-coronavirus-covid-19-learning-losses.pdf>; and Sanz, Ismael, Miguel Cuervo, and Luis Miguel Doncel. “El efecto del coronavirus en el aprendizaje de los alumnos: efecto en el uso de recursos digitales educativos.” In Ismael Sanz (ed.). *El capital humano en la economía digital*. Madrid: Funcas, Papeles de Economía Española, n.º 166, 2020. 2-18. <https://www.funcas.es/wp-content/uploads/2021/01/PEE-166-WEB.pdf>.

<sup>96</sup> For further details, see: Martínez García, José S., and Pablo Molina Derteano. “Fracaso escolar, crisis económica y desigualdad de oportunidades educativas: España y Argentina.” *Papers UAB*, 2019. <https://papers.uab.cat/article/view/v104-n2-martinez-molina>; and Serrano, Lorenzo, et al. “El abandono educativo temprano: análisis del caso español.” *Instituto Valenciano de Investigaciones Económicas*, 2013. [http://web2016.ivie.es/wp-content/uploads/2017/06/Informe\\_Abandono\\_Educativo\\_Temprano.pdf](http://web2016.ivie.es/wp-content/uploads/2017/06/Informe_Abandono_Educativo_Temprano.pdf).

<sup>97</sup> Ruiz-Valenzuela, Jenifer. “Job loss at home: children’s school performance during the Great Recession.” *SERIEs* 11, 2020. <https://doi.org/10.1007/s13209-020-00217-1>.

<sup>98</sup> Department of Education and Vocational Training *Sistema Estatal de Indicadores de la Educación 2020*. Madrid, 2020. <https://www.educacionyfp.gob.es/dam/jcr:7bd02364-3fd2-405f-b0d6-4fe05debbd38/seie-2020.pdf>.

<sup>99</sup> For further details, see: De la Fuente, Ángel. “Gasto educativo por regiones y niveles en 2015 y su evolución desde 2000.” *BBVA Research, Documentos de trabajo*, n.º 18/10, 2018. <https://www.bbva.com/wp-content/uploads/2018/09/Datos-gasto-edu-2000-15.pdf>; and Pérez García, Francisco, and Ezequiel Uriel Jiménez. “Cuentas de la educación en España, 2000-2013: Recursos, gastos y resultados.” *Fundación BBVA*, 2016. [https://www.fbbva.es/wp-content/uploads/2017/07/DE\\_2016\\_IVIE\\_Cuentas\\_de\\_la\\_educacion.pdf](https://www.fbbva.es/wp-content/uploads/2017/07/DE_2016_IVIE_Cuentas_de_la_educacion.pdf).

<sup>100</sup> The most recent evidence shows that investment in school education has a positive causal effect on students' learning and academic progress, especially for the most vulnerable ones. For further details,

see: Jackson, C. Kirabo. “Does School Spending Matter? The New Literature on an Old Question.” *NBER Working Paper*, n.º 25368, 2018. <https://www.nber.org/papers/w25368.pdf>.

<sup>101</sup> Department of Education and Vocational Training *Financiación educativa. Public and household expenditure on education in Spain [F1.1]* 2020. <http://www.educacionyfp.gob.es/inee/indicadores/sistema-estatal/mapa-indicadores/segunda-epoca-2018-en-adelante.html>.

<sup>102</sup> The government earmarked an additional 2 billion euros to strengthen education systems during the pandemic, to which European recovery funds will have to be added. For further details, see: Official State Gazette. *Real Decreto-ley 22/2020, de 16 de junio, por el que se regula la creación del Fondo COVID-19 y se establecen las reglas relativas a su distribución y libramiento*. Madrid, 2020. <https://www.boe.es/boe/dias/2020/06/17/pdfs/BOE-A-2020-6232.pdf>; y Gobierno de España. *Proyecto Plan de Recuperación, Transformación y Resiliencia*. Madrid, 2021. <https://www.lamoncloa.gob.es/presidente/actividades/Documents/2021/130421-%20Plan%20de%20recuperacion%2C%20Transformacion%20y%20Resiliencia.pdf>.

<sup>103</sup> World Economic Forum *New Vision for Education: Fostering Social and Emotional Learning through Technology*. Ginebra, 2016. [http://www3.weforum.org/docs/WEF\\_New\\_Vision\\_for\\_Education.pdf](http://www3.weforum.org/docs/WEF_New_Vision_for_Education.pdf); and OECD. *Trends shaping education 2019*. Paris: OECD Publishing, 2019. <https://doi.org/10.1787/22187049>.

<sup>104</sup> Elliott, Stuart W. *Computers and the Future of Skill Demand*. Paris: OECD Publishing, 2017. <https://doi.org/10.1787/9789264284395-en>.

<sup>105</sup> Key competences identified by the European Commission include: 1) competence in reading and writing in the mother tongue; 2) foreign language competence; 3) mathematics and science competences; 4) digital competence; 5) interpersonal competences and ability to acquire new competences (“learning to learn”); 6) social and civic competences; 7) entrepreneurial competence; and 8) competence in cultural awareness and expression. For further details, see: European Commission. *Key competences for lifelong learning*. Luxembourg: Publications Office of the EU, 2019. <https://op.europa.eu/en/publication-detail/-/publication/297a33c8-a1f3-11e9-9d01-01aa75ed71a1/language-en>.

<sup>106</sup> European Commission. *Science, research and innovation performance of the EU 2018: Strengthening the foundations for Europe’s future*. Luxembourg: Publications Office of the EU, 2018. <http://reader.asturias.org/wp-content/uploads/2018/04/Informe-sobre-ciencia-investigaci%C3%B3n-e-innovaci%C3%B3n-de-la-UE.pdf>.

<sup>107</sup> These projections are based on the Eurostat baseline scenario for population growth up to 2050 and assume the following: 1) a linear decrease in the percentage of students repeating an academic year at age 15 from 28.7% in PISA 2018 to 20% in 2050 and 2) a linear decrease in early school leavers from 17.3% in 2019 to 10% in 2050. For further details, see: Eurostat. *Population on 1st January by age, sex and type of projection [proj\_19np]*. 2020. <https://ec.europa.eu/eurostat/data/database>.

<sup>108</sup> Reducing repetition by 18 percentage points would imply an increase of about 12 points in PISA (the marginal effect of reducing repetition by 1 per cent is an improvement of 0.68 points), roughly equivalent to learning almost half a year of schooling in the most advanced countries.



For further details, see: García- Pérez, J. Ignacio, Marisa Hidalgo-Hidalgo, and Antonio Robles-Zurita. "Does grade retention affect achievement? Some evidence from PISA." *Pablo de Olavide University*, WP ECON, 2011. <http://www.upo.es/serv/bib/wps/econ1109.pdf>; and OECD. *PISA 2018*. <https://www.oecd.org/pisa/>.

<sup>109</sup>In Spain, the repetition rate in primary and secondary education is, on average, 5%, and 28% of students aged 15 have repeated an academic year at least once (in the case of the OECD, this percentage drops to 11%). Convergence to OECD repetition levels would mean reducing average annual repetition by 60% to 2%. Reducing the repetition rate by 1 point would imply a drop in education expenditure per student of approximately 1.25 percentage points (the ratio is greater than unity since repeating students generally require a greater educational effort). Therefore, a reduction of the repetition rate by 3 points (from 5% on average to 2%) would imply a reduction of expenditure in primary and secondary education of 3.75 points. On the other hand, the number of students between primary and secondary education reaches 4.7 million (not including private education). Given that the average expenditure per student is around 5,500 euros, the total expenditure on public education in these educational stages is around 25 billion euros. A reduction of 3.75% results in a saving of 900 million euros. For further details, see: Ferrer, Álvaro. *Todo lo que debes saber de PISA 2018 sobre equidad*. Madrid, 2019. [https://www.savethechildren.es/sites/default/files/imce/dossier\\_pisa2018\\_espanadatos.pdf](https://www.savethechildren.es/sites/default/files/imce/dossier_pisa2018_espanadatos.pdf); and Department of Education and Vocational Training. *Sistema Estatal de Indicadores de la Educación 2020*. Madrid, 2020. <https://www.educacionyfp.gob.es/dam/jcr:7bd02364-3fd2-405f-b0d6-4fe05debbd38/seie-2020.pdf>.

<sup>110</sup>Authors' own, based on PISA 2018 data. For further details, see: OECD. *PISA 2018*. <https://www.oecd.org/pisa/>.

<sup>111</sup>In this respect, the new Organic Law for the Modification of the LOE (LOMLOE) has eliminated the prevalence of the number of failed subjects for promoting to the next year and has transferred greater power to the teaching staff who, in a collegiate manner, will decide on the progress of each student according to the degree of acquisition of competences. For further details, see: Official State Gazette. *Ley Orgánica 3/2020, de 29 de diciembre de, por la que se modifica la Ley Orgánica 2/2006, de 3 de mayo, de Educación*. Madrid, 2020. <https://www.boe.es/boe/dias/2020/12/30/pdfs/BOE-A-2020-17264.pdf>.

<sup>112</sup>Ferrer, Álvaro. *Todo lo que debes saber de PISA 2018 sobre equidad*. Madrid, 2019. [https://www.savethechildren.es/sites/default/files/imce/dossier\\_pisa2018\\_espanadatos.pdf](https://www.savethechildren.es/sites/default/files/imce/dossier_pisa2018_espanadatos.pdf).

<sup>113</sup>European Commission. *Communication of the Commission Europe 2020: the European Union strategy for growth and employment. COM(2010) 2020 final*. Brussels, 2020. <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:ES:PDF>.

<sup>114</sup>The graph shows the results in Serrano *et al.* (2013) under the assumption that students who do not drop out prematurely complete post-compulsory secondary education. These results do not take into account the general equilibrium effects that an increase in post-secondary graduates could have on the labour market. For further details, see: Serrano, Lorenzo, *et al.* "El abandono educativo temprano: análisis del caso español." Instituto Valenciano de Investigaciones Económicas, 2013. [http://web2016.ivie.es/wp-content/uploads/2017/06/Informe\\_Abandono\\_Educativo\\_Temprano.pdf](http://web2016.ivie.es/wp-content/uploads/2017/06/Informe_Abandono_Educativo_Temprano.pdf).

<sup>115</sup>Eurostat. *Early leavers from education and training [edat\_lfse\_14]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>116</sup>The effect, between 0.4 and 0.5 percentage points, refers to the increase in the annual rate of GDP growth once the entire active population has achieved higher educational attainment. For further details, see: Hanushek, Eric A., and Ludger Woessmann. "Universal Basic Skills: What countries stand to gain." *Paris: OECD Publishing*, 2015. <https://doi.org/10.1787/9789264234833-en>.

<sup>117</sup>Kautz, Tim, *et al.* "Fostering and Measuring Skills: Improving Cognitive and Non-Cognitive Skills to Promote Lifetime Success." *NBER Working Paper* n.º 20749, 2014. <https://www.nber.org/papers/w20749>.

<sup>118</sup>OECD. *PISA 2018 Results (Volume I): What Students Know and Can Do. Annex B1 Results for countries and economies*. <https://doi.org/10.1787/5f07c754-en>.

<sup>119</sup>The marginal effect of reducing repetition by 1% is 0.68 points in PISA. For further details, see: García- Pérez, J. Ignacio, Marisa Hidalgo-Hidalgo, and Antonio Robles-Zurita. "Does grade retention affect achievement? Some evidence from PISA." *Pablo de Olavide University*, WP ECON, 2011. <http://www.upo.es/serv/bib/wps/econ1109.pdf>; and OECD. *PISA 2018*. <https://www.oecd.org/pisa/>.

<sup>120</sup>OECD. *Trends shaping education 2019*. Paris: OECD Publishing, 2019. <https://doi.org/10.1787/22187049>.

<sup>121</sup>According to Eurostat's baseline scenario for demographic projections. For further details, see: Eurostat. *Population on 1st January by age, sex and type of projection [proj\_19np]*. 2020. <https://ec.europa.eu/eurostat/data/database>.

<sup>122</sup>In 2018, the latest year available, the number of students per educational group in primary education was 22 and 25 in secondary education. For further details, see: Department of Education and Vocational Training. *Sistema estatal de indicadores de la educación*. <https://www.educacionyfp.gob.es/inee/indicadores/sistema-estatal.html>.

<sup>123</sup>Denmark is taken as a reference for two main reasons: it is a world educational power and has a similar level of per capita income today as Spain will have in 2050 if it implements the changes set out in this *Strategy*.

<sup>124</sup>Public expenditure on these formative stages would increase by only 3 tenths of GDP. For further details, see the *Apunte metodológico* número VI. For more data and ideas:

<sup>125</sup>N kow, Andre, Philip Oreopoulos, y Vincent Quan. "The Impressive Effects of Tutoring on PreK-12 Learning: A Systematic Review and Meta-Analysis of the Experimental Evidence." *NBER Working Paper*, n.º 27476, 2020. <https://www.nber.org/papers/w27476.pdf>.

<sup>126</sup>Tuomi, Ilkka. "The Impact of Artificial Intelligence on Learning, Teaching, and Education." *JRC Science for Policy Report*, Luxembourg: Publications Office of the European Union, 2018. [https://publications.jrc.ec.europa.eu/repository/bitstream/JRC113226/jrc113226\\_jrcb4\\_the\\_impact\\_of\\_artificial\\_intelligence\\_on\\_learning\\_final\\_2.pdf](https://publications.jrc.ec.europa.eu/repository/bitstream/JRC113226/jrc113226_jrcb4_the_impact_of_artificial_intelligence_on_learning_final_2.pdf).

<sup>127</sup>For further details, see: Nkambou, Roger, Roger Azevedo, and Julita Vassileva (eds.). *Intelligent Tutoring Systems*. Montreal: Springer International Publishing, 2018. <https://www.springer.com/>

gp/book/9783319914633; and Penstein Rosé, Carolyn, *et al.* (eds.). *Artificial Intelligence in Education*. London: Springer International Publishing, 2018. <https://www.springer.com/gp/book/9783319938455>.

<sup>128</sup> Carlana, Michela, and Eliana La Ferrara. "Apart but Connected: Online Tutoring and Student Outcomes during the COVID-19 Pandemic." *HKS Working Paper*, n.º RWP21-001, 2021. <https://www.hks.harvard.edu/publications/apart-connected-online-tutoring-and-student-outcomes-during-covid-19-pandemic>.

<sup>129</sup> A paradigmatic example is the Swedish company *Lexplore*, which has developed a system that quickly scans at-risk students and detects dyslexia by tracking the reader's eye movements. For further details, see: Lexplore, <https://www.lexplore.com/>.

<sup>130</sup> For further details, see: Boccanfuso, Laura, *et al.* "Emotional Robot to Examine Differences in Play Patterns and Affective Response of Children with and Without ASD." 2016. <https://dl.acm.org/doi/10.5555/2906831.2906837>; and Scassellati, Brian, Henry Admoni, and Maja Mataric. "Robots for use in autism research." *Annual Review of Biomedical Engineering* 14. 2012. <https://doi.org/10.1146/annurev-bioeng-071811-150036>.

<sup>131</sup> Tuomi, Ilkka. "The Impact of Artificial Intelligence on Learning, Teaching, and Education." *JRC Science for Policy Report*, Luxembourg: Publications Office of the European Union, 2018. [https://publications.jrc.ec.europa.eu/repository/bitstream/JRC113226/jrc113226\\_jrcb4\\_the\\_impact\\_of\\_artificial\\_intelligence\\_on\\_learning\\_final\\_2.pdf](https://publications.jrc.ec.europa.eu/repository/bitstream/JRC113226/jrc113226_jrcb4_the_impact_of_artificial_intelligence_on_learning_final_2.pdf).

<sup>132</sup> MIT Technology Review. "Machine Learning Opens Up New Ways to Help People with Disabilities." MIT Technology Review, <https://www.technologyreview.com/2017/03/23/68727/machine-learning-opens-up-new-ways-to-help-disabled-people/>.

<sup>133</sup> For a detailed analysis of the relationship between digital technologies and emotional wellness in childhood, see: Burns, Tracey, and Francesca Gootschalk (eds.). *Educación e infancia en el siglo XXI: El bienestar emocional en la era digital*. Madrid: Fundación Santillana, 2020. <https://www.oecd.org/education/ceii/Educaci%C3%B3n-e-infancia-en-el-siglo-XXI-Bienestar-emocional-en-la-era-digital.pdf>.

<sup>134</sup> The 2003 Brussels European Council already set as a benchmark "to bring the maximum percentage of 15 year olds with level 1 and below in reading literacy in PISA to below 15%" by 2010. For further details, see: European Council. *Council Conclusions on Reference Levels of European Average Performance in Education and Training (Benchmarks)*. Brussels, 2003. <https://data.consilium.europa.eu/doc/document/ST-8981-2003-INIT/en/pdf>; and Roca Cobo, Enrique. "El abandono temprano en la educación y la formación en España." *Revista de Educación*, n.º extra 1, 2010. [http://www.revistaeducacion.educacion.es/re2010/re2010\\_02.pdf](http://www.revistaeducacion.educacion.es/re2010/re2010_02.pdf).

<sup>135</sup> The EU-8 and EU-22 are constructed as the simple average of the values of the individual countries from PISA 2018 microdata. The EU-22 consists of the EU-27 member countries that are also members of the OECD, which excludes Bulgaria, Croatia, Cyprus, Malta and Romania. The latest data available is from 2018. For further details, see: Ferrer, Álvaro. *Todo lo que debes saber de PISA 2018 sobre equidad*. Madrid, 2019. [https://www.savethechildren.es/sites/default/files/imce/dossier\\_pisa2018\\_espanadatos.pdf](https://www.savethechildren.es/sites/default/files/imce/dossier_pisa2018_espanadatos.pdf); and OECD *PISA 2018*. <https://www.oecd.org/pisa/>.

<sup>136</sup> The early school drop out rate is defined as the percentage of the population between 18 and 24 years of age whose highest educational level is secondary education or lower, and who are not currently in formal education. The EU-8 is constructed as the simple average of the values of the individual countries, and the EU-27 is the aggregate indicator reported by Eurostat. The latest data available is from 2019. For further details, see: Eurostat. *Early leavers from education and training by sex and labour status [edat\_lfse\_14]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>137</sup> The European Strategy set a target of 10% for 2020. For further details, see: European Commission. *Europe 2020: A European strategy for smart, sustainable and inclusive growth*. Brussels: European Commission, 2020. <https://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf>.

<sup>138</sup> The population aged 25-34 with a qualification higher than secondary education is defined as the percentage of people in this age range whose highest level of education is the second stage of secondary education (Bachillerato or Intermediate Level Vocational Training) or tertiary education (University or Higher Level Vocational Training). The EU-8 is constructed as the simple average of the values of the individual countries, and the EU-27 is the aggregate indicator reported by Eurostat. The latest data available is from 2019. For further details, see: Eurostat. *Population by educational attainment level, sex and age (%) - main indicators [edat\_lfse\_03]*. <https://ec.europa.eu/eurostat/data/database>

<sup>139</sup> The odds ratio is used, i.e. at equal mathematics and science proficiency, how many times higher is the probability of repeating an academic year for a student from a more disadvantaged background compared to a student with more resources. For example, a value of 4 means that, with equivalent skills in mathematics and science, a student with fewer resources (25% of students with fewer resources) is four times more likely to have repeated an academic year than a student from a more favourable background (25% of students with more resources). The EU-8 and EU-22 are constructed as the simple average of the values of the individual countries from PISA 2018 microdata. The EU-22 consists of the EU-27 member countries that are also members of the OECD, which excludes Bulgaria, Croatia, Cyprus, Malta and Romania. The latest data available is from 2018. For further details, see: Ferrer, Álvaro. *Todo lo que debes saber de PISA 2018 sobre equidad*. Madrid, 2019. <https://www.educacionyfp.gob.es/inee/evaluaciones-internacionales/pisa/pisa-2018/pisa-2018-informes-es.html>; and OECD. *PISA 2018*. <https://www.oecd.org/pisa/>.

<sup>140</sup> The percentage of low-achieving 15-year-olds in PISA is defined as the percentage of students below level 2 (below 406 points). The EU-8 and EU-22 are constructed as the simple average of the values of the individual countries from PISA 2018. The EU-22 consists of the EU-27 member countries that are also members of the OECD, which excludes Bulgaria, Croatia, Cyprus, Malta and Romania. The figure corresponds to the average of 2015 and 2018. For further details, see: Department of Education and Vocational Training. *PISA 2018 Resultados de lectura en España*. Madrid, 2020. <https://www.educacionyfp.gob.es/inee/evaluaciones-internacionales/pisa/pisa-2018/pisa-2018-informes-es.html>; and OECD. *PISA 2018 Results (Volume I): What Students Know and Can Do. Tablas I.B1.7, I.B1.8, and I.B1.9*. <https://doi.org/10.1787/5f07c754-en>.

<sup>141</sup> The percentage of low-achieving 15-year-olds in PISA is defined as the percentage of students below level 2 (below 406 points). The EU-8 and EU-22 are constructed as the simple average of the values of the individual countries from PISA 2018. The EU-22 consists of the EU-27 member countries that are also members of the OECD, which excludes Bulgaria, Croatia, Cyprus, Malta and Romania. The figure corresponds to the average of 2015 and 2018. For further details, see: Department of Education and Vocational Training. *PISA 2018 Resultados de lectura en España*. Madrid, 2020. <https://www.educacionyfp.gob.es/inee/evaluaciones-internacionales/pisa/pisa-2018/pisa-2018-informes-es.html>; and OECD. *PISA 2018 Results (Volume I): What Students Know and Can Do. Tablas I.B1.7, I.B1.8, and I.B1.9*. <https://doi.org/10.1787/5f07c754-en>.

<sup>142</sup> Public expenditure on education includes both expenditure on pre-primary, primary and secondary education and expenditure on post-compulsory education (bachillerato, vocational training and university). In 2018 (latest year available), pre-primary, primary and secondary education accounted for around 60% of total public spending on education in our country. The EU-8 and EU-27 are constructed as the simple average of the values of the individual countries. The latest available data for Spain is from 2018, while for the EU-8 and EU-27 it is from 2017. For further details, see: Department of Education and Vocational Training. *Gasto Público en educación en relación al P.I.B. por cobertura económica, tipo de administración y periodo*. <http://www.educacionyfp.gob.es/servicios-al-ciudadano/estadisticas/economicas/gasto.html>; and UNESCO. *Government expenditure on education as a percentage of GDP (%)*. <http://data.uis.unesco.org/#>.

<sup>143</sup> Public expenditure on education of 5.5% of GDP is the result of increasing expenditure per student to current Danish levels and assuming a GDP evolution in line with the EU-8 convergence objective [see chapter 1]. The difference compared to the EU-8, which currently spends 6.1% of its GDP on education, is that the reduction in the number of students will be very sharp in the coming decades, allowing us to increase funding per student significantly without such a sharp increase as a percentage of GDP.

<sup>144</sup> For further details, see: Cox, Cristián. "Construcción política de reformas curriculares: el caso de Chile en los noventa." Profesorado. *Revista de currículum y formación del profesorado*, n.º 10, 2006. <https://www.ugr.es/~recfpro/rev101ART5.pdf>; López Rupérez, Francisco. *El currículo y la educación en el siglo XXI. La preparación del futuro y el enfoque por competencias*. Madrid: Ediciones Narcea, 2020; and Zubillaga del Río, Ainara. "¿Es el sistema español un sistema educativo innovador?" *ICE, Economía de la Educación y Política Educativa*, n.º 910, 2019. <http://www.revistasice.com/index.php/ICE/articulo/view/6920/6933>.

<sup>145</sup> Stiglitz, Joseph E., and Bruce C. Greenwald. *La creación de una sociedad del aprendizaje*. Madrid: La Esfera de los Libros, 2016.

<sup>146</sup> European Commission. *Key competences for lifelong learning*. Luxembourg: Publications Office of the EU, 2019. <https://op.europa.eu/en/publication-detail/-/publication/297a33c8-a1f3-11e9-9d01-01aa75ed71a1/language-en>.

<sup>147</sup> Elliott, Stuart W. *Computers and the Future of Skill Demand*. Paris: OECD Publishing, 2017. <https://doi.org/10.1787/9789264284395-en>.

<sup>148</sup> UNESCO. "Futures literacy." UNESCO, <https://en.unesco.org/futuresliteracy>.

[futuresliteracy](https://en.unesco.org/futuresliteracy).

<sup>149</sup> In terms of integrating the climate agenda into the education curriculum, Finland is a good example to follow. For further details, see: Department of the Environment and Statistics Finland. *Finland's Sixth National Communication under the United Nations Framework Convention on Climate Change: Chapter 9*. Helsinki, 2013. [https://tilastokeskus.fi/tup/khkinv/nc6\\_chapter\\_9.pdf](https://tilastokeskus.fi/tup/khkinv/nc6_chapter_9.pdf).

<sup>150</sup> In this respect, the LOMLOE incorporates a new learning area: "Education in Civic and Ethical Values" which has as its main lines of content "knowledge and respect for Human and Children's Rights, those contained in the Spanish Constitution, education for sustainable development and global citizenship, the social function of taxes and fiscal justice, equality of women and men and the value of respect for diversity, fostering a critical spirit, a culture of peace and non-violence and respect for the environment and animals". For further details, see: Official State Gazette. *Ley Orgánica 3/2020, de 29 de diciembre de, por la que se modifica la Ley Orgánica 2/2006, de 3 de mayo, de Educación*. Madrid, 2020. <https://www.boe.es/boe/dias/2020/12/30/pdfs/BOE-A-2020-17264.pdf>.

<sup>151</sup> OECD. "La infancia y las tecnologías digitales: tendencias y resultados." In Tracey Burns, and Francesca Gootschalk (eds.). *Educación e infancia en el siglo XXI: El bienestar emocional en la era digital*. Madrid: Fundación Santillana, 2020. <https://www.oecd.org/education/ceri/Educaci%C3%B3n-e-infancia-en-el-siglo-XXI-Bienestar-emocional-en-la-era-digital.pdf>.

<sup>152</sup> For example, Finland carries out a curriculum review every 10 years and Singapore, every 6 years. For further details, see: Chin, Tang-Yin, and Chew-Leng Poon. "Design and Implementation of the National Primary Science Curriculum: A Partnership Approach in Singapore." *Inquiry into the Singapore Science Classroom*, 2014. [https://link.springer.com/chapter/10.1007%2F978-981-4585-78-1\\_2](https://link.springer.com/chapter/10.1007%2F978-981-4585-78-1_2); and Tikkanen, Lota, et al. "Lessons learnt from a large-scale curriculum reform: The strategies to enhance development work and reduce reform-related stress." *Journal of Educational Change*, n.º 21, 2020. <https://link.springer.com/article/10.1007/s10833-019-09363-1>.

<sup>153</sup> Official Gazette of the Spanish Parliament. *Proposición no de Ley presentada por el Grupo Parlamentario Socialista, sobre la creación del Instituto de Desarrollo Curricular*. Madrid, 2020. [https://www.congreso.es/public\\_oficiales/L14/CONG/BOCG/D/BOCG-14-D-137.PDF](https://www.congreso.es/public_oficiales/L14/CONG/BOCG/D/BOCG-14-D-137.PDF).

<sup>154</sup> For example, Finland has the *National Forum for Skills Anticipation* For further details, see: Department of Education and Culture of Finland. *Anticipation of skills and education needs in Finland*. 2019. <https://minedu.fi/documents/1410845/4150027/Anticipation+of+skills+and+education+needs/d1a00302-8773-bbe0-39a0-46e0d688d350/Anticipation+of+skills+and+education+needs.pdf>.

<sup>155</sup> Moya, José, et al. "Documento de líneas de actuación dirigidas a la definición de un modelo profesional docente." *Red por el Diálogo Educativo*, 2018. <https://www.dialogorede.es/wp-content/uploads/2019/03/doc-lineas-concrecion.pdf>.

<sup>156</sup> An interesting experience is the case of Australia. For further details, see: OECD. *Improving the Quality of the Selection Process of Teacher Candidates in Australia*. Paris: OECD Publishing, 2018. <http://www.oecdteacherready.org/wp-content/uploads/2018/05/FINAL->

REV-Promising-Practice-Australia-4-Improving-quality-of-teacher-candidates.pdf.

<sup>157</sup> Evidence shows that mentoring programmes can be an effective policy to improve teacher performance and preparation. For further details, see: Jackson, C. Kirabo, Jonah E. Rockoff, and Douglas O. Staiger. "Teacher effects and teacher-related policies." *Annual Review of Economics* 6, 2014. <https://doi.org/10.1146/annurev-economics-080213-040845>; and Rockoff, Jonah E. "Does mentoring reduce turnover and improve skills of new employees? Evidence from teachers in New York City." *NBER Working Paper*, n.º 13868, 2008. <https://www.nber.org/papers/w13868.pdf>.

<sup>158</sup> Authors' own, based on data from the Department of Education and Vocational Training. For further details, see: Department of Education and Vocational Training. *Enseñanzas no universitarias. Estadística del profesorado y otro personal. Enseñanzas de Régimen General. Profesorado por titularidad del centro, comunidad autónoma/provincia, sexo y edad*. <https://www.educacionyfp.gob.es/servicios-al-ciudadano/estadisticas/no-universitaria/profesorado/estadistica.html>.

<sup>159</sup> Department of Education and Vocational Training *Igualdad en cifras MEFP*. Madrid, 2019. <https://www.educacionyfp.gob.es/dam/jcr:957c29bb-ebd1-4e5b-9417-3d163cc32def/cifrasweb.pdf>.

<sup>160</sup> For the case of France, see: Piketty, Thomas. "L'impact de la taille des classes et de la ségrégation sociale sur la réussite scolaire dans les écoles françaises: une estimation à partir du panel primaire 1997." 2004. <http://piketty.pse.ens.fr/files/Piketty2004b.pdf>. For the case of Australia, see: OECD. *Attracting Teachers to Schools in Rural and Remote Areas in Australia*. Paris: OECD Publishing, 2018. <http://www.oecdteacherready.org/wp-content/uploads/2018/05/FINAL-REV-Promising-Practice-Australia-1-Attracting-teachers-to-remote-areas-1.pdf>.

<sup>161</sup> The Territorial Cooperation Programmes are coordinated by the Department of Education and Vocational Training and aim to "promote territorial cooperation in order to achieve general educational objectives, reinforce students' basic skills, foster students' knowledge and appreciation of the cultural and linguistic wealth of the different Autonomous Communities, and contribute to inter-territorial solidarity and territorial balance in compensating for inequalities" For further details, see: Department of Education and Vocational Training. "Programas de Cooperación Territorial." Department of Education and Vocational Training <http://www.educacionyfp.gob.es/mc/sgctie/cooperacion-territorial/programas-cooperacion.html>.

<sup>162</sup> Blanchenay, Patrick, and Tracey Burns. "Policy experimentation in complex education systems." In Tracey Burns, and Florian Köster (eds.). *Governing Education in a Complex World*. Paris: OECD Publishing, 2016. <https://doi.org/10.1787/9789264255364-10-en>.

<sup>163</sup> Refer to: Department of Education and Science. Madrid, 2005. Madrid, 2005. <https://sede.educacion.gob.es/publiventa/d/22315/19/0>; and Department of Education and Vocational Training. *Indicadores de la Estrategia 2020 de Educación y Formación*. Madrid, 2020. <http://www.educacionyfp.gob.es/servicios-al-ciudadano/estadisticas/internacional/eurostat/estrategia2020.html>.

<sup>164</sup> Council of the European Union. *Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030)*. 2021. [https://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:32021G0226\(01\)&from=EN](https://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:32021G0226(01)&from=EN).

<sup>165</sup> For further details, see: Balázs, Égert, Jarmila Botev, and David Turner. "The Contribution of Human Capital and Its Policies to per Capita Income in Europe and the OECD." *European Economic Review* 129, 2020. <https://doi.org/10.1016/j.euroecorev.2020.103560>.

<sup>166</sup> In this respect, the LOMLOE is committed to avoiding schools or areas of schools with a high concentration of vulnerable students. For further details, see: Official State Gazette. *Ley Orgánica 3/2020, de 29 de diciembre de, por la que se modifica la Ley Orgánica 2/2006, de 3 de mayo, de Educación*. Madrid, 2020. <https://www.boe.es/boe/dias/2020/12/30/pdfs/BOE-A-2020-17264.pdf>.

<sup>167</sup> In this sense, the LOMLOE introduces a new external evaluation system. On the one hand, it recovers the mid-stage census evaluations (4th year of Primary education and 2nd year of secondary education), of a diagnostic nature and with a framework agreed between the Department of Education and Vocational Training and the National Institute for Educational Evaluation, which were already present in the LOE. In addition, it introduces general evaluations of the Spanish education system at the end of each stage (Primary and Secondary education), which will be carried out at national level, and will be sample-based and multi-annual. For further details, see: Official State Gazette. *Ley Orgánica 3/2020, de 29 de diciembre de, por la que se modifica la Ley Orgánica 2/2006, de 3 de mayo, de Educación*. Madrid, 2020. <https://www.boe.es/boe/dias/2020/12/30/pdfs/BOE-A-2020-17264.pdf>.

<sup>168</sup> Empirical evidence shows that external assessments at student and school level that allow for comparative analysis over time improve students' academic performance. However, using internal tests that simply report without being able to compare them externally does not have an effect on student performance. For further details, see: Bergbauer, Annika B., Eric A. Hanushek, and Ludger Woessmann. "Testing." *NBER Working Paper*, n.º 24836, 2018. <https://www.nber.org/papers/w24836.pdf>.

<sup>169</sup> Education Endowment Foundation, <https://educationendowmentfoundation.org.uk>.

<sup>170</sup> Best Evidence Synthesis, <https://www.educationcounts.govt.nz/topics/BES>.

<sup>171</sup> What Works Clearinghouse, <https://ies.ed.gov/ncee/wwc/>.

<sup>172</sup> For more details on the suitability of split versus continuous working hours, see: Gromada, Anna, and Claire Shewbridge. "Student Learning Time: A Literature Review." *OECD Education Working Papers*, n.º 127, Paris: OECD Publishing, 2016. <https://doi.org/10.1787/5jm409kqqkjh-en>.

<sup>173</sup> The current mechanism for allocating schools to students is known as the Boston Mechanism. It is characterised by its limited ability to capture household preferences accurately and to foster (strategic) economic segregation. For further details, see: Abdulkadiroglu, Atila, and Tayfun Sönmez. "School choice: A mechanism design approach." *American Economic Review* 93, n.º 3. 2003. <https://www.aeaweb.org/articles?id=10.1257/000282803322157061>; and Calsamiglia, Caterina, Francisco Martínez-Mora, and Antonio Miralles. "School Choice Design, Risk Aversion, and Cardinal Segregation." *Economic Journal*,



2020. <https://academic.oup.com/ej/advance-article/doi/10.1093/ej/ueaa095/5890338>.

<sup>174</sup> The draft of the "Recovery, Transformation and Resilience Plan" can play a key role on this front. Component 19 of the "National Plan for Digital Skills" and component 21 "Modernisation and digitalisation of the education system, including early education from 0-3 years" with a joint funding of around 5 billion euros aims, among other things, to increase the provision of portable devices to reduce the digital gap; to improve the digital skills of the teaching staff; and to extend the public offer in the first cycle of pre-primary education. For further details, see: Government of Spain. *Recovery, Transformation and Resilience Plan* Madrid, 2021. <https://www.lamoncloa.gob.es/presidente/actividades/Documents/2021/130421-%20Plan%20de%20recuperacion%2C%20Transformacion%20y%20Resiliencia.pdf>.

<sup>175</sup> Balázs, Égert, Jarmila Botev, and David Turner. "The Contribution of Human Capital and Its Policies to per Capita Income in Europe and the OECD." *European Economic Review* 129, 2020. <https://doi.org/10.1016/j.euroecorev.2020.103560>.

<sup>176</sup> Gortazar, Lucas (coord. *La financiación del sistema educativo: invertir en calidad, equidad e inclusión*. Red por el Diálogo Educativo y Asociación Nacional de Editores de Libros y material de Enseñanza, 2020. <https://www.dialogorede.es/wp-content/uploads/2020/12/3-libro-financiacion.pdf>.

<sup>177</sup> The LOMLOE is committed to moving towards free schooling in subsidised schools. With regard to complementary activities involving a monetary charge, it is determined that: (i) those that are necessary for the curriculum must be scheduled without economic discrimination; (ii) those that are extracurricular cannot be scheduled during school hours; and (iii) complementary services (e.g. canteen or transport) will have additional measures to ensure that economic circumstances do not prevent access. For further details, see: Official State Gazette. *Ley Orgánica 3/2020, de 29 de diciembre de, por la que se modifica la Ley Orgánica 2/2006, de 3 de mayo, de Educación*. Madrid, 2020. <https://www.boe.es/boe/dias/2020/12/30/pdfs/BOE-A-2020-17264.pdf>; Ferrer, Álvaro, and Lucía Martínez. "Mézclete conmigo. De la segregación socioeconómica a la educación inclusiva." *Save the Children*. Madrid, 2019. [https://www.savethechildren.es/sites/default/files/imce/docs/mezclate\\_conmigo.pdf](https://www.savethechildren.es/sites/default/files/imce/docs/mezclate_conmigo.pdf); and Gortazar, Lucas. "Lo bueno, lo ausente y lo malo de la nueva Ley de Educación." *EsadeEcPol - Center for Economic Policy & Political Economy*, 2020. <http://itemsweb.esade.edu/research/EsadeEcpol-Insight-23-ley-educacion-.pdf>