RESEÑA

MINISTERIO DE EDUCACIÓN, FORMACIÓN PROFESIONAL Y DEPORTES (2023): *PISA 2022. PROGRAMA PARA LA EVALUACIÓN INTERNACIONAL DE LOS ESTUDIANTES. INFORME ESPAÑOL.* MADRID, INEE.

REVIEW

MINISTERIO DE EDUCACIÓN, FORMACIÓN PROFESIONAL Y DEPORTES (2023): *PISA 2022. "PROGRAMA PARA LA EVALUACIÓN INTERNACIONAL DE LOS ESTUDIANTES. INFORME ESPAÑOL" (PROGRAM FOR INTERNATIONAL STUDENT ASSESSMENT. SPANISH REPORT). MADRID, INEE.*

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Resumen

El presente texto tiene por objeto sintetizar los datos extraídos del Informe PISA 2022. Para ello, en primer lugar, se propone una pequeña introducción con relación al propósito de esta evaluación comparativa internacional. Posteriormente, se procede a la exposición de los aspectos más relevantes de cada uno de los apartados del Informe español. Por último, a modo síntesis, se reflejan las conclusiones más relevantes de dicho informe.

Palabras clave: *reseña de libro, publicaciones gubernamentales, educación, evaluación internacional, indicadores educativos.*

Abstract

The purpose of this text is to synthesize the data extracted from the PISA 2022 Report. To do this, first of all, a brief introduction is showed about the purpose of this international comparative evaluation. Subsequently, the most relevant aspects of each of the sections of the Spanish Report are presented. Finally, as a summary, the most relevant conclusions of said report are reflected.

Keywords: book review, government publications, education, international evaluation, educational indicators.
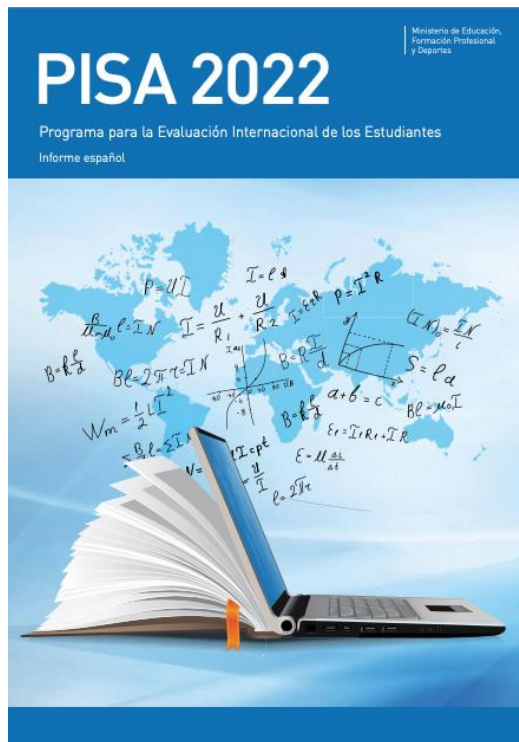
DATA SHEET

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INTRODUCTION

The Programme for International Student Assessment (PISA) has become the international benchmark for comparative assessment, analyzing the reality of educational systems. Promoted by the Organization for Economic Cooperation and Development (OECD) in collaboration with other participating countries, PISA aims to assess what students know and can do at the end of their compulsory education (15-16 years old).

This study began in the year 2000, with triennial cycles of assessment. The 2022 edition was originally scheduled for 2021 but had to be postponed due to the unfortunate circumstances of the COVID-19 pandemic. There are three core competencies that form the basis of educational assessment: mathematical, reading, and scientific. Each assessment cycle focuses more intensely on one of these competencies. PISA 2022 places mathematical competency at the forefront, while the other two take a secondary role.

Additionally, each cycle introduces innovative competencies, such as financial literacy (2012), collaborative problem-solving (2015), global competence (2018), creative thinking (2022), and learning in a digital world (2025).

The PISA 2022 study results, in relation to core competencies, were released on December 5, 2023. The report prepared in this regard is the main purpose of this review.

Other reports on creative thinking, financial literacy assessment and lifelong learning will be published in the course of 2024.

STRUCTURE AND CONTENT

The Spanish PISA 2022 report is structured in a prologue, five chapters and an annex.

In the **PROLOGUE**, reference is made to the need for implementing egalitarian policies regarding educational systems, serving as guarantors of advanced societies. Likewise, the reason for the one-year postponement of the planned 2021 assessment is explained (due to COVID-19), and the core competency around which it was organized is highlighted (mathematical competency). It also underscores Spain's uninterrupted participation in this study since its first edition (PISA 2000).

The **FIRST CHAPTER** of the report is dedicated to the contextualization of the study. The triennial cycles will transition to quadrennial cycles starting in 2025, although there are no plans to alter its essence: guiding educational policies through the comparison of academic performances, promoting the integration of theoretical and practical knowledge through competency-based tasks, and conducting a quasi-longitudinal analysis with a high degree of participation.

The PISA 2022 sample comprised a total of 690,000 students from 80 different countries (37 from the OECD and 43 associated). Spain participated with 30,800 students from 4th year of ESO (between 15 and 16 years old), representing 966 educational centers distributed across its entire geography (17 autonomous communities and 2 autonomous cities).

Concerning the assessments conducted, it is necessary to distinguish between the cognitive test and the questionnaires. The cognitive test, lasting 2 hours and administered on a computer, follows a matrix design (providing valid and reliable performance estimates) and has an adaptive nature (based on results from preceding blocks). Competencies are assessed in a combined manner (in pairs), with a focus on mathematics (primary), reading and science (secondary), and innovative creative thinking. Additionally, in Spain, financial literacy was also addressed (optional). The questionnaires provide diverse information about the students' context (family, school, attitude towards mathematics, creative thinking, or use of ICT), thus contributing to a more thorough analysis and interpretation of the obtained results.

Regarding mathematical competency, defined as the "ability to reason mathematically and to formulate, employ, and interpret mathematics to solve problems in a variety of real-life contexts," it is noteworthy that the study is structured around 4 mathematical processes: reasoning, formulating, employing, and interpreting, and evaluating. It also encompasses 4 content blocks: quantity, uncertainty, and data, change and relationships, and space and shape. The questions vary in difficulty, with up to 3 student proficiency levels (Types A, B, and C; with Type C students having lower performance) and 8 proficiency levels (1a, 1b, 1c, 2, 3, 4, 5, and 6; where Level 1c corresponds to the easiest questions).

The study refers to the concept of statistically significant difference (Gil Pascual, 2015). It is approached from a 95% confidence interval, ensuring that differences that may arise due to sample error (population) or measurement error (questions) are not interpreted as real. Additionally, present data is correlated with scores from previous cycles to provide greater robustness to score comparisons.

The **SECOND CHAPTER** breaks down the data obtained for each of the competencies: mathematics, reading, and science, with a particular emphasis on analyzing the first as the primary reference competency on this occasion. Noteworthy in the analysis is the comparison of Spain's results with the "OECD Average" (arithmetic mean, giving equal weight to all countries) and the "EU Total" (which references the student population, not the country's score). Additionally, the analysis compares these three results (Spain, OECD Average, and EU Total) with the scores obtained by each of the autonomous communities and cities.

Regarding **mathematical competency**, the highest estimated average performances are achieved by Japan (536), Korea (527), and Estonia (510). In contrast, Mexico (395), Costa Rica (385), and Colombia (383) present the more modest performances.

Spain (473) does not present statistically significant differences with respect to the OECD average (472) and the EU total (474), placing it in the upper third of level 2, of the three levels foreseen. As for the autonomous communities and cities, Castile and León (499), Principality of Asturias (495), Cantabria (495) and Community of Madrid (494) stand out favorably, while Ceuta (395), Melilla (404), the Canary Islands (447) and Andalucía (457) stand out in the opposite direction.

The study pays attention not only to the estimated average performance of a country or region, but also to the dispersion of results among its students. In this way, the aim is to assess the degree of equity in the educational system (Murillo, 2004). In Spain, the interquartile range (difference between the 75th and 25th percentile value) is 120, far from the OECD average value (128) and the EU total (132). All the autonomous communities and cities are below the OECD average and the EU total, with Galicia (111),

the Canary Islands (111) and Melilla (111) standing out favorably for lowering this range, and La Rioja (123) and Catalonia (123) for their greater dispersion.

The study also takes into account the distribution of students by performance levels. According to the results obtained, the number of students who have reached the highest levels (5 and 6) or do not achieve the minimum expected level (level 2) is both decreasing and increasing. In the first case, Spain (6%) is below the OECD average (9%) and the EU total (8%). In the second, the opposite is true. Spain achieves 27%, compared to 29% for the EU total and 31% for the OECD average. This leads us to deduce that the results in Spain are at intermediate levels, which refutes the lower dispersion of data mentioned in the previous paragraph. As for the autonomous communities and cities, La Rioja, Principality of Asturias and Castile and León achieve better results than the OECD Average and EU Total in decreasing order (students achieving levels 5 or 6), and the Region of Murcia, Andalusia, the Canary Islands, Melilla and Ceuta obtain results below the OECD Average and EU Total in increasing order (students who do not achieve level 2, the minimum required level).

Regarding the performances on the sub-scales of processes and content specified for the assessment of mathematical competency, the following points should be noted:

At the international level, Japan, Korea, Estonia, and Switzerland consistently stand out for the high performance of their students. Conversely, Mexico, Costa Rica, and Colombia are worth mentioning.

Spain achieves slightly lower performance than the OECD Average and EU Total in the processes "Formulating mathematical situations" (465, compared to 469 and 468, respectively) and "Using mathematical concepts, facts, and procedures" (470,

compared to 472 and 473), while performing slightly higher in the processes "Interpreting and evaluating mathematical results" (477, compared to 474 and 476) and "Mathematical reasoning" (477, compared to 473 and 474). The latter is a new element compared to PISA 2012, the last assessment where mathematical competency was also the central focus.

Regarding content, Spain achieves an estimated average score higher than the OECD Average and EU Total in "Change and relationships" (474, compared to 470 and 471, respectively) and "Uncertainty and data" (478, compared to 474 and 475), while slightly lower in "Quantity" (471, compared to 472 and 473). The most significant negative difference is observed in the "Space and shape" block (463, compared to 471 and 471).

As for the autonomous communities and cities, with recurring nature, higher yields are usually mentioned for Castilla y León, Principality of Asturias, Community of Madrid, Cantabria, Foral Community of Navarra and La Rioja, and for more discrete yields, Ceuta, Melilla, Canary Islands, Andalusia, Region of Murcia and Castilla-La Mancha.

Regarding reading competency, the highest estimated average performances are achieved by Ireland (516), Japan (516), and Korea (515). Conversely, Colombia (409), Bulgaria (404), and Cyprus (381) present more modest performances. Looking at proficiency levels, the standout performers are the United States, Canada, and Korea (Levels 5 and 6), while Cyprus, Bulgaria, and Colombia have the highest percentage of students who do not reach the minimum required Level 2.

Spain's estimated average performance (474) does not differ significantly from the OECD Average (476) or the EU Total (475). However, it is noteworthy that the performance level at Levels 5 and 6 in Spain (5%) is lower than the OECD Average and EU Total (7% in both). Conversely, when considering the percentage of students who do

not reach the minimum Level 2 (24% in Spain), it is slightly better than the OECD Average and EU Total (26% in both). In other words, Spain occupies a relatively better position in the percentage of students at lower proficiency levels than at higher proficiency levels, a pattern observed in mathematical competency and expected to repeat in scientific competency.

In terms of autonomous communities and cities, the most favorable estimated average yields are achieved in Castilla y León (498), Principado de Asturias (487) and Comunidad de Madrid (496). On the other hand, Ceuta (404), Melilla (405), Andalusia (461) and Catalonia (462). In terms of performance levels, Madrid, Castile and Leon and Principality of Asturias achieve a higher percentage of students in levels 5 and 6, while Melilla, Ceuta, Andalusia and Catalonia have a higher percentage of students who do not achieve the minimum required level 2.

With respect to scientific competence, the best estimated average performance is obtained by Japan (547), Korea (528) and Estonia (526). In contrast, Costa Rica (411), Cyprus (411) and Mexico (410) show the most discrete performances. In terms of performance levels, Japan, Korea and Finland stand out favorably (levels 5 and 6), while Cyprus, Colombia and Mexico are the countries with the highest percentage of students who do not achieve the minimum required level 2.

Spain's performance (485) does not present statistically significant differences with the OECD Average (485) or with the EU Total (484). However, as will be anticipated, performance at higher levels in Spain (5%) is somewhat lower than in the OECD Average and EU Total (7% in both), although this trend is reversed at lower levels (21% in Spain, compared to 24% in the OECD Average and EU Total).

As for the autonomous communities and cities, the most favorable estimated average returns are achieved in Castile and Leon (506), Galicia (506) and Cantabria (504). On the other hand, Ceuta (410), Melilla (414), the Canary Islands (473) and Andalusia (473). In terms of performance levels, Castile and Leon, Principality of Asturias and La Rioja achieve a higher percentage of students in levels 5 and 6, while Melilla, Ceuta, Andalusia, and Catalonia have a higher percentage of students who do not achieve the minimum required level 2.

The analysis of this second chapter concludes with a chronological perspective, comparing the data now collected with previous editions of PISA (2012, 2015 and 2018). Practically, a significant slump is experienced in the performance of the three core competencies of the study, a trend that has been progressive since 2012, beyond the possible influence exerted on this occasion by the COVID-19 health crisis.

With regard to the situation in Spain, it is worth noting an insignificant improvement in science proficiency, a somewhat milder drop than in the OECD Average in reading proficiency and a significantly negative variation in the average mathematical proficiency, although this is doubled in the OECD Average.

As can be seen in the following graphs, Spain's estimated average performance in the three core competencies is similar to the OECD and EU averages, to which it should be added that the dispersion of results among students is decreasing (less performance at higher and lower levels).

Figura 2.15. Evolución de los rendimientos medios estimados en matemáticas entre 2012 y 2022 para España, el Promedio OCDE y el Total UE
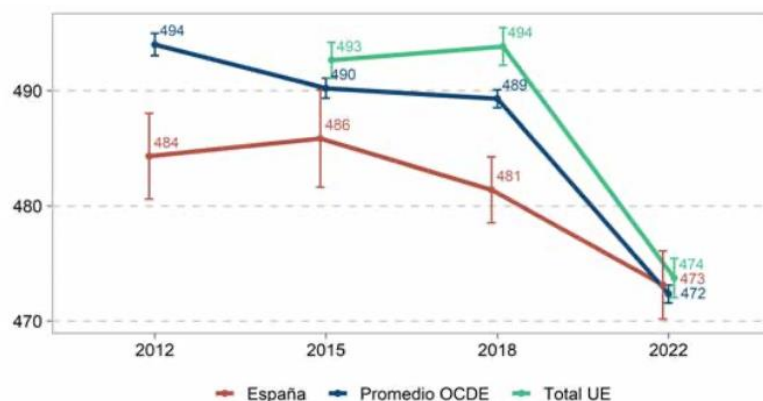

Figura 2.26. Evolución de los rendimientos medios estimados en lectura entre 2012 y 2022 para España, el Promedio OCDE y el Total UE
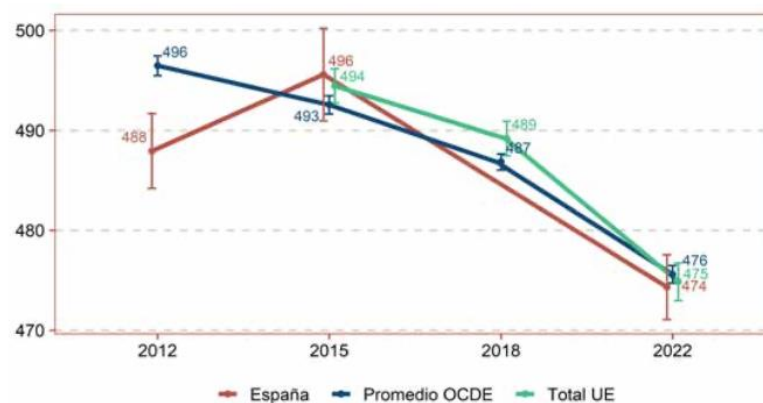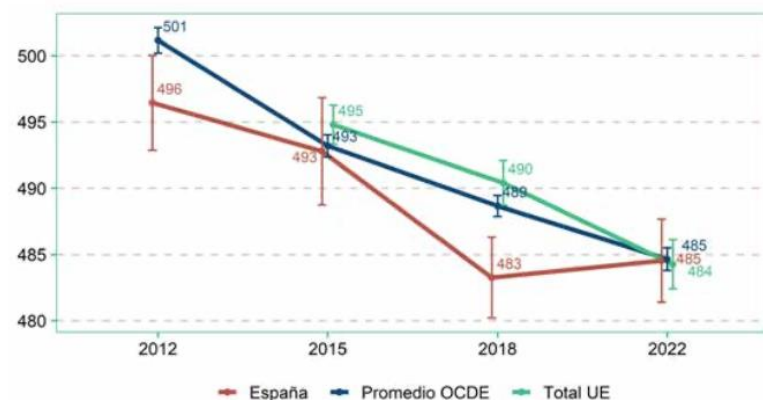

Figura 2.29. Evolución de los rendimientos medios estimados en ciencias entre 2012 y 2022 para España, el Promedio OCDE y el Total UE

(Figures taken from pages 62, 81 and 85 of the Spanish PISA 2022 Report)

The **THIRD CHAPTER** of the report focuses on analyzing factors that could contribute to higher performance and greater equity in educational systems, considering both concepts as not mutually exclusive. Equity is understood as an ethical principle linked to the concept of justice, where students' academic performance should depend on their abilities rather than their circumstances (social, economic, and cultural context). To achieve equity, two key dimensions are considered: equality (reducing or mitigating social or personal circumstances) and inclusion (ensuring a minimum standard for all).

The **performance-gender** linkage continues to show a pattern similar to that of previous PISA studies. PISA 2022 reveals differences in mathematical competency favoring boys and in reading competency favoring girls. The difference in scientific competency is not as pronounced, varying between countries. In Spain, the gender difference follows the previously described trend, which is also observed in the OECD Average and EU Total. Specifically, there is a 10-point advantage for boys in mathematical competency (468-478), a 25-point advantage for girls in reading competency (487-462), and a 5-point advantage for boys in scientific competency (482-487). No significant differences are established regarding autonomous communities and cities. PISA 2022, compared to PISA 2018, shows an increase in the gender score difference.

The relationship between performance and immigration is an aspect that also requires attention, given the increase in migratory flows and the number of refugee intakes. Undoubtedly, language and multiculturalism emerge as two complex obstacles to overcome. The report analyzes the data, distinguishing between native students (at least one parent born in the country where the test is conducted) and

immigrant students (no parent born in the country where the test is conducted). No distinction is made regarding whether immigrant students are first or second generation (students born or not born in the country where the test is conducted). Spain, with a 15% immigrant student population, has a similar percentage to the OECD Average (13%) and EU Total (14%). Regarding performance in different competencies, generally, native students always achieve better results. In Spain, it is noteworthy that the differences in reading (32) and scientific (36) competencies are significantly smaller than the OECD Average (41 and 38, respectively) and EU Total (46 and 49). Mathematical competency (33) in Spain is slightly higher than the OECD Average (30) but is also significantly lower than the EU Total (42). Concerning autonomous communities and cities, it is worth noting that in Andalusia, Ceuta, and the Canary Islands, no significant differences are observed between the two types of students. However, in the Basque Country, Principality of Asturias, and Aragon, differences reach values even higher than those indicated by the EU Total.

The combination of performance and ownership of the educational center is another element analyzed in this study. Private centers, including partially publicly funded charter schools, fall under the category of privately owned. Firstly, it is noteworthy that the percentage of students enrolled in public centers is considerably lower in Spain (69%) than in the OECD Average (84%) and EU Total (85%). Secondly, while the general trend is for students in private centers to achieve higher estimated performance in all competencies, in Spain, this difference increases compared to the OECD Average and EU Total. For instance, in mathematical competency, differences of 35, 27, and 23 points are observed; in reading competency, differences of 32, 28, and 18 points; and in scientific competency, differences of 32, 27, and 22 points, respectively (Spain, OECD Average, and EU Total data, always in this order).

Finally, this chapter also explores the relationship between **performance and social, economic, and cultural** status. The natural tendency is that students who benefit from economic, cultural, and social privileges ultimately achieve better results in higher education and higher salaries in their jobs. However, this trend is not set in stone. PISA has created the ISEC (Index of Social, Economic, and Cultural Status; ESCS in English), a score that combines information from three components into a single data point: the highest educational level of the parents, the highest occupational status of the parents, and family wealth. Using the OECD Average as a reference point (0.00), it is understood that Spain (-0.03) has a socio-economic and cultural index very close to the OECD Average and similar to the EU Total (-0.04). However, concerning autonomous communities and cities, it is worth noting unfavorably Melilla (-0.79) and Ceuta (-0.47), and favorably, the Community of Madrid (+0.25) and the Basque Country (+0.18). Statistical analysis shows a strong positive correlation between the ISEC and the estimated average performance in mathematical competency. Regarding the difference between ISEC quartiles, the performance gap dependent on socioeconomic levels in Spain (86) is smaller than the OECD Average (93) and the EU Total (102). Likewise, all autonomous communities and cities have differences between lower quartiles lower than the EU Total, and except for Catalonia, they also have a difference lower than the OECD Average. Therefore, although influential, this factor is somewhat mitigated in Spain.

The ISEC allows calculating the socioeconomic gradient, i.e., the inequality that contextual circumstances impose on a student. The greater the association between the indicator and their performance, the less social justice. In Spain, 14.2% ($R^2=0.142$) of the variability in students' results in mathematical competency can be attributed to social, economic, and cultural status, a percentage below the OECD Average ($R^2=0.155$; 15.5%) and the EU Total ($R^2=0.180$; 18.0%). It also represents one of the lowest percentages among selected countries, which can be considered a positive indicator of

equity in the educational system. The Basque Country, Region of Murcia, Melilla, and Principality of Asturias show a percentage even higher than the OECD Average. Noteworthy for their low percentage are Cantabria (7.5%), Galicia (9.3%), and Valencia (9.9%). Overall, the influence of the ISEC on the estimated average score of Spanish students in mathematical competency is not statistically significant. It would barely increase by two points, a situation similar to the OECD Average (2 points) and half as influential compared to the EU Total (4 points).

CHAPTER FOUR compiles the students' opinions regarding their well-being in the school environment, attitude toward mathematics, segregation, and resilience. These opinions were reflected in a questionnaire, and it is essential to note that they stem from subjective assessments. However, the information is included in this report as it is considered crucial for students to demonstrate an adequate use of their psychological, cognitive, material, social, and physical capacities to live satisfactorily and fully exploit their potential. In other words, it aims to promote a comprehensive education for citizens.

Regarding the **school environment**, the analysis focuses on three fundamental aspects: peer bullying, the sense of belonging, and the relationship with teachers.

PISA 2022 asked students 9 statements, from which a percentage of feeling bullied among peers was obtained. Spain, with 6.5%, is among the countries with a lower percentage of students who are frequently bullied (OECD average, 8.3%). The most common profile of a bullying episode is usually a boy, economically disadvantaged and immigrant. In the case of Spain, however, bullying is more often associated with the female gender. It should also be noted that the most disadvantaged and immigrant students feel more bullied in Spain (-0.15 and -0.18) than in the OECD average (-0.02 and -0.08) and the EU as a whole (-0.07 and -0.10). It can be seen that

students with a lower bullying index generally obtain higher scores in mathematical competence, although this is not a constant trend. For example, Spain, with a bullying index of -0.38, lower than the OECD Average (-0.30) and the EU Total (-0.30), obtains an average performance in mathematics of 473, very close to the OECD Average (472) and the EU Total (474).

Additionally, PISA 2022 presented students with 3 positive statements and 3 negative statements regarding their sense of belonging to the school. The results place Spain, with an index of 0.27 points, in 3rd place in the ranking, well above the EU Total (0.04) and the OECD Average (-0.02). In general, the profile of a boy, advantaged and native, enjoys a greater sense of belonging. There is a positive correlation between the sense of belonging to the school and performance in mathematical competency in most OECD and/or EU countries. However, in the case of Spain, this initially positive data (3rd place in the ranking) does not ultimately reflect in the students' performance in mathematical competency.

Similarly, students were exposed to 6 positive statements and 2 negative statements regarding their relationship with teachers. Spain, with a value of 0.15 in this index, is significantly above the OECD Average (0.00) and well above the EU Total (-0.10). Once the data is disaggregated by gender, ISEC, and immigration, there is great variability in results across countries, with no common pattern established. Although Spain (0.15) still falls within the quadrant where countries with averages above the OECD are located, both in performance and in the index value, this data can hardly be linked to the students' performance in mathematical competency.

Relating to **attitude towards mathematics**, PISA 2022 analyzes the relationship of anxiety, self-efficacy and growth mindset of students with this subject.

Through 6 indicators, PISA 2022 collects the students' feelings of anxiety in relation to mathematics. With 0.37 points, Spain is well above the data collected in the OECD Average (0.17) and EU Total (0.17). The most affected student profile corresponds to a girl, disadvantaged and immigrant. There is evidence of a negative association between the mathematical anxiety index and performance in mathematical competence. The countries, communities and autonomous cities that have a higher anxiety index generally obtain lower scores in mathematics. It is estimated that for each point increase in the anxiety index, 20 points of academic performance would correspond to a 20-point decrease.

Following the same strategy, PISA 2022 exposes 10 statements to students to measure their degree of confidence with respect to mathematical competence. Spain (0.03) achieves a positive index, close to, but slightly higher than the OECD Average (0.01) and EU Total (0.01). The profile of the self-efficient student is a favored child (no statistically significant differences are shown between native and immigrant students). It can be seen that, for each point of increase in the mathematical self-efficacy index in Spain, 18 points of performance in mathematical competence would be gained (23 in OECD average and 21 in EU total). However, there is no direct association between the self-efficacy index and mathematics achievement in the graph, since no common pattern is established.

Similarly, students were asked about their agreement with the following statement: "Your intelligence is something about you that you can't change much." Spain (-0.09) has a negative growth mindset index value, similar to the EU Total (-0.08), but significantly below the OECD Average (0.02). The indicator is higher among socioeconomically advantaged boys (no statistically significant differences between native and immigrant students). In all cases, a positive relationship is observed between growth mindset and performance in mathematics. However, as in the previous section,

a direct association between the growth mindset index and mathematics performance is not evident, as there is no common pattern observed in the graph.

Regarding **segregation**, the aim is to measure the isolation index. Since we have mixed educational systems, it is not appropriate for the study to consider the gender variable. Regarding the variables favored —not favored, natives— immigrants and low performance - high performance, Spain shows slightly lower or similar values to the OECD average. This implies, for example, less school segregation in Spain for socioeconomic or academic reasons than in the OECD Average.

As for the concept of **resilience**, the study attempts to calculate the percentage of students whose academic performance is above what is statistically expected based on their context. In Spain, 12% of socioeconomically disadvantaged students scored in the top quarter of expected performance in mathematical competence, compared to 10% of the OECD average. Linking resilience with the other concepts mentioned in the third and fourth chapters, using a multiple linear regression model, it is concluded that gender and self-efficacy are variables that improve the percentages of resilient students, that repetition, anxiety and peer bullying are variables that have a negative impact on the resilience condition, and that belonging, relationship with teachers and growth mindset do not show a statistically significant impact.

The **FIFTH** and last CHAPTER of this report analyzes the teaching and learning process during the COVID-19 health crisis and its possible impact on current outcomes. To this end, attention is paid to the duration of school closures, the use of ICT for educational purposes, teacher and family support during school closures, and the impact of school closures on educational equity and the socioemotional status of students.

As for the **duration of school closures**, Spain had its schools closed for 45 days, which would imply a variation of -7 points in the estimated average performance. However, the regression line does not differ significantly from 0, which would indicate that there is no relationship between this variable and the drop in performance.

Regarding the **use of ICT** for educational purposes, it is worth noting the fact that those countries that in 2018 reported a greater use of ICT for educational purposes, the drop in performance attributable to COVID-19 has been greater. This leads to the conclusion that the use of these tools is not synonymous with autonomy and effectiveness on the part of the student body. Although the ICT management index increases in Spain from 0.08 to 0.11 points, this variable is not finally shown as a differential for the variation in performance attributable to the pandemic period.

PISA 2022 included two statements on **teacher and family support** during school closures. In this aspect, Spain falls to the bottom of the ranking (positions 32 and 33, out of 39). However, it is worth remembering once again that the data are based on purely subjective assessments. In general terms, the higher the rate of need for family support, the greater the drop in mathematics performance. This can be explained by the fact that the most demanding students coincide with those who require more support and follow-up.

As regards the degree of **equity**, a comparison of the data for 2018 and 2022 shows that in 14 countries, including Spain, the difference is not significant, and even in 9 countries the situation is reversed (the decrease in the performance of academically disadvantaged students is significantly lower).

Finally, as for the **socioemotional impact** of students, students from Mediterranean countries obtained a lower percentage with respect to feelings of

loneliness (Spain, 31%), but increased this percentage with respect to feelings of anxiety (Spain, 44%) and homesickness for physical and sports activities (Spain, 61%). The indicator, therefore, of socioemotionally affected students is relevant, which corroborates the educational center as a capital physical space in the teaching-learning process. Nevertheless, in the face of this adversity, interesting percentages of enjoyment (56%) and motivation (38%) in self-learning were detected, as well as confidence in being prepared to learn on their own (57%).

In the **ANNEX**, a summary of the PISA 2022 mathematics test framework is provided, along with a set of released items from the pilot study and another set of released items from the main study, not selected for the 2025 edition.

CONCLUSIONS

Due to COVID-19, PISA 2021 had to be postponed by a year. The same will happen with the next cycle (PISA 2024 moves to 2025). Starting from 2025, the study is planned to be conducted every four years.

PISA 2022 took place in 80 countries, with a total sample of 690,000 students aged 15-16. Spain has been participating in this study since the year 2000.

The main focus in this instance is on mathematical competence. Reading and scientific competencies are secondary, and an innovative competence, creative thinking, is also included. The report on this latter competence is expected in 2024.

The mathematics test is structured into 4 processes and 4 content blocks. Three levels of students and 8 proficiency levels are estimated (the minimum required being level 2, with levels 1a, 1b, and 1c below this).

Countries with the best statistical average performances are Japan (536), Korea (527), and Estonia (510) in mathematical competence; Ireland (516), Japan (516), and Korea (515) in reading competence; and Japan (547), Korea (528), and Estonia (526) in scientific competence.

Countries with more discreet statistical average performances are Mexico (395), Costa Rica (385), and Colombia (383) in mathematical competence; Colombia (409), Bulgaria (404), and Cyprus (381) in reading competence; and Costa Rica (411), Cyprus (411), and Mexico (410) in scientific competence.

Spain does not present statistically significant differences with respect to the OECD Average and the EU Total, neither in mathematical competence (473, 472 and 474, respectively), nor in reading competence (474, 476 and 475), nor in scientific competence (485, 485 and 484). However, it stands out for having a lower dispersion in the results (fewer higher and lower levels), which would be equivalent to a greater degree of equity.

As for the autonomous communities and cities, in mathematical proficiency, Castile and Leon, Principality of Asturias, Community of Madrid, Cantabria, Foral Community of Navarre and La Rioja stand out for their superior performance, and Ceuta, Melilla, Canary Islands, Andalusia, Region of Murcia and Castile-La Mancha for their more discrete performance. In reading proficiency, the most favorable estimated average performances are achieved in Castile and Leon (498), Principality of Asturias (487) and Community of Madrid (496). In the opposite case are Ceuta (404), Melilla (405), Andalusia (461) and Catalonia (462). In scientific competence, the most favorable estimated average performances are achieved in Castile and Leon (506), Galicia (506) and Cantabria (504). On the other hand, Ceuta (410), Melilla (414), the Canary Islands (473) and Andalusia (47%) were the most favorable (473).

In general, all three competencies have experienced a consistent and significant decline in all countries since 2012, further intensifying in this latest cycle (2018-2022).

PISA 2022 shows gender differences in mathematical competence favoring boys and in reading competence favoring girls. Generally, native students consistently achieve better results than immigrants, as well as students attending private schools rather than public schools.

The influence of the Index of Social, Economic, and Cultural Status (ISEC) on the estimated average scores of Spanish students in mathematical competence is not statistically significant. It would barely increase by two points, a situation similar to the OECD average (2 points) and half as influential compared to the entire EU (4 points).

Regarding the school environment, it is observed that students who experience less bullying generally achieve higher scores in mathematical competence. There is also a positive correlation between the sense of belonging to the school and performance in mathematical competence. However, this correlation is not always evident, as seen in the case of Spain, for example.

It is estimated that for every point increase in the math anxiety index, there would be a corresponding decrease of 20 points in academic performance in that competency.

Spain exhibits lower school segregation based on socioeconomic reasons or academic factors than the OECD average, along with a higher percentage of resilient students (12% in Spain, compared to the OECD's 10%).

The health crisis caused by COVID-19 does not appear as a differentiating and significant factor in the decline of the estimated average performance in the PISA 2022 test. Its impact is more closely associated with the socio-emotional realm than the academic one.

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