Academic performance in the context of bilingual education

Rendimiento académico en el contexto de la enseñanza bilingüe

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Abstract:

This study examines factors impacting Mathematics and Science and Technology performance in sixth-grade primary education students in Castilla y León, Spain. The analysis focusses on scores in Mathematics and Science and Technology from questionnaires administered as part of the Final Individualized Assessment by the Junta de Castilla y León. The studied sample consisted of 1,652 sixth-grade students from 49 schools across various provinces of that region during the 2018–2019 academic year. The study considered variables previously identified in the literature as having an impact on academic performance: gender, geographic area, school ownership (public or private), socioeconomic and cultural status (ISEC), school absenteeism, grade repetition, and homework. Additionally, the study included a new variable — presence or absence of bilingual education in schools. The results revealed that bilingual education, when considered alone, does not impact academic performance in Mathematics or Science and Technology. However, when analyzed individually, gender and school ownership significantly affect Mathematics performance. Our data shows that higher scores are achieved by male and private school students. Furthermore, other factors such as socioeconomic status (ISEC), class attendance, grade repetition, and number of days spent doing homework were found to individually affect both Mathematics and Science and Technology performance. Academic performance improves as ISEC increases, absenteeism decreases, grade repetition is avoided, and homework is completed on more days. Differences in performance were observed when analyzed regarding bilingual or non-bilingual education modalities. For example, Mathematics performance is higher in boys from autonomous bilingual sections than from non-bilingual schools.

Keywords: Academic performance, Academic achievement, Performance factors, Socioeconomic factors, Primary education, Bilingual education, Student evaluation.

Resumen

Este estudio explora los factores que influyen en el rendimiento en Matemáticas y en Ciencia y Tecnología de estudiantes castellano-leoneses del nivel de sexto de Educación Primaria. Se analizaron las puntuaciones en Matemáticas y Ciencia y Tecnología obtenidas a partir de cuestionarios que la Junta de Castilla y León aplicó, como parte de la evaluación individualizada final de etapa, a una muestra de 1652 escolares de 49 colegios de diferentes provincias de la comunidad en el curso 2018- 2019. Se analizaron variables explicativas que la literatura ya ha destacado como influyentes en el rendimiento académico: género, ámbito territorial, titularidad, ISEC, absentismo escolar, repetición de curso y deberes. Asimismo, se estudió también una variable novedosa que es la presencia o no de enseñanza bilingüe en los centros. Los resultados indicaron que la enseñanza bilingüe de forma aislada no influye en el rendimiento académico de las áreas de Matemáticas y de Ciencia y Tecnología. Mientras que el género o la titularidad estudiados individualmente sí condicionan el rendimiento en Matemáticas, de forma que los chicos y los centros concertados-privados poseen mejores rendimientos. Además, otras variables como el ISEC, las faltas a clase, la repetición de curso o el número de días empleados para hacer deberes analizadas individualmente influyen tanto en el rendimiento de Matemáticas como en el de Ciencia y Tecnología, incrementándose estos cuando el ISEC es mayor, se falta menos a clase, no se repite y se hacen más días los deberes. Cuando analizamos las variables en el contexto de las modalidades de enseñanza bilingüe observamos que sí existen diferencias entre los distintos tipos de centros. Entre ellas, los chicos tienen mejor rendimiento en Matemáticas en las secciones autonómicas bilingües que en los centros no bilingües.

Palabras clave: Rendimiento académico, factores que afectan al rendimiento, variables socioeconómicas, educación primaria, enseñanza bilingüe, evaluación del estudiante.

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Introduction

Academic performance has been a perennial topic of interest in the field of education. Torres and Rodríguez (2006) define it as the level of knowledge relative to a given standard, while Vilches et al. (2018) interpret it as the effectiveness in achieving curricular objectives, reflecting the degree of learning acquired.

Martínez-Otero (2007), adopting a humanistic perspective, describes academic performance as "the output produced by students in educational institutions, typically expressed through school grades" (p. 34). Similarly, Caballero et al., Abello and Palacio (2007) emphasize that academic performance entails meeting goals, achievements and objectives of a program or subject, also expressed through grades.

As Grasso (2020) notes, academic performance is used to evaluate the effectiveness of the education system, encompassing both the level achieved by students and the level performed by teachers. Various tools have been used to measure academic performance, such as analyzing report card grades, which is considered a reliable and valid method (Edel, 2003).

To complement these tools, the Organic Law 8/2013 proposed a final evaluation for sixth-grade students (MECD, 2015). Article 21 establishes that an individualized assessment of Primary Education (PE) students must be conducted at the end of their stage to verify the degree of acquisition of linguistic communication competence, mathematical competence and basic competencies in science and technology (S&T), as well as the achievement of overall stage objectives (p. 16). This evaluation was conducted from the 2015/16 to the 2018/19 academic years on a sample basis for diagnostic purposes. The collected data generated several reports: one individualized report for each student regarding his/her acquisition of linguistic communication, mathematics and S&T competencies, issued also for their family and tutor; other report for teaching and school management teams; and an aggregated report regarding the reference territory for education authorities. These efforts aimed to establish improvement measures across all levels of the educational administration and by all its members (MECD, 2015). Given that educational powers are transferred to the Autonomous Communities in Spain, regional

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administrations conducted these evaluations under the National Institute for Educational Evaluation guidelines (MEFP, 2019).

These evaluations provide a good context for analyzing PE student performance. However, it must be acknowledged that academic performance is a complex concept that often generates confusion (González et al., 2012), and its evaluation should consider students' contexts and realities. Thus, beyond definitions, it is essential to explore factors influencing or conditioning students' academic performance

Tejedor (2003), identifies multiple interrelated factors that condition academic performance, within a complex network where problems and causes are difficult to pinpoint. Torres and Rodríguez (2006) classify these factors into four categories: social and cultural, school-related, familial and personal. Several studies have investigated these factors. Regarding social and cultural aspects, research highlights families' socioeconomic factors (Pozo-Burgos et al., 2022; Chaparro et al., 2016), and father and/or mother education levels (Zambrano-Mendoza, 2019; Glick et al., 2011). For schoolchildren, studies focus on the school environment (Barreto & Álvarez, 2017; Buckman et al., 2021), teacher influence (Ambussaidi & Yang, 2019; De la Torre & Ávila, 2002) and school quality (Willms, 2010). Familial factors address parents' attitudes toward their children as perceived positively or negatively by them (Chaparro et al., 2016; Zambrano-Mendoza et al., 2019). Finally, personal factors include intellectual aptitudes (Castejón & Vera, 1996), self-concept (Chávez-Becerra et al., 2020; Redondo & Jiménez, 2020), self-esteem (García et al., 2006; Tejada, 2018) and social competence (Torres et al., 2020).

The context surrounding the students may include factors not encompassed within the previously mentioned categories, which may condition their academic performance. One such factor could be bilingual education. According to Vinuesa and Izquierdo (2019), bilingual education refers to an educational model in which exposure to a second language (a foreign language) serves as a medium for accessing non-linguistic knowledge. It involves the use of two or more languages as a medium of instruction for part or all of the school curriculum. Báez and González (2013) further define bilingual education as an approach where any subject content can be taught in both languages, with both serving instrumental purposes.

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In Castilla y León, two types of bilingual schools coexist: autonomous bilingual sections (SAB) and schools with the British Council Bilingual Education Program (PEB-BC).

The SABs were established under Order EDU/6/2006, which regulates the creation of SABs in publicly funded "schools and defines bilingual sections as schools that, once authorized, use a foreign language to teach content of certain areas or non-linguistic subjects" (p. 781). These schools are required to offer a minimum of two and a maximum of three non-linguistic subjects taught in a foreign language, with no more than 50% of total student instructional hours delivered in that language.

Neither the LOMCE (the educational law in effect at the time of this study; BOE, 2013) nor the current LOMLOE law (BOE, 2020) explicitly specifies which subjects must be taught in a foreign language, leading to variations among schools. Typically, subjects such as Natural Sciences, Social Sciences, (or their combination, Environmental Knowledge, that emerged after the LOMLOE), Art, Music or Physical Education are taught in English. Most schools primarily teach Natural Sciences in English (Vega-Agapito et al., 2021, Consejería de Educación, Ciencia y Universidades, 2023) and Mathematics is never taught in a language other than the native one.

The PEB-BC program was established through a collaboration agreement signed in 1996 between the Ministry of Education and the British Council Spain Foundation. Its main objective is to teach English language and culture through an integrated curriculum (Falcón-Diaz et al., 2019). In this program, non-linguistic subjects taught in English are specifically defined by legislation as Environmental Knowledge, Artistic Education, and Physical Education. During the PE stage, students receive between 10 and 12 hours of instruction in English per week (Falcón-Diaz et al., 2019).

Both SAB and PEB-BC fall under the "partial" bilingual programs, offering immersion close to 50% in the second language. These programs differ significantly from "transitional" programs (Baker and Wright, 2021), where students begin instruction in their native language, but eventually transition to using the second language as the medium of instruction. Schools with PEB-BC programs align more closely to bicultural bilingualism as defined by Molina (2003), whereas SABs represent monocultural bilingualism

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with predominance of the culture linked to the native language.

Implementing these programs should entail a measured, structured process based on previous research analyzing the potential effects of bilingual education on students' academic performance. As Pavón (2018) notes, some question the benefits of bilingual education from a social perspective, while others point out the lack of sufficient scientific evidence to thoroughly assess the impact of these programs on academic content learning. Agraso-López et al. (2021) emphasize the lack of a generalized consensus needed to establish a clear relationship between bilingual education and academic performance. Nevertheless, they cite studies where the superiority of bilingual students over monolingual is evident.

According to Ardila (2012), individuals who speak two languages exhibit greater metalinguistic awareness, enhanced cognitive control, mental flexibility, better performance on verbal and nonverbal tasks, improved academic development, greater capacity for cognitive resources, better comprehension of the first language, stronger metalinguistic and metacognitive skills and better-controlled processing. Costa (2017) attributes these advantages to increased gray matter density in specific brain regions among bilingual individuals, which fosters the development of certain cognitive abilities.

In this regard, Mohr et al. (2018) discuss brain restructuring resulting from bilingual studies, while Chamorro and Janke (2022) have found that students engaged in bilingual education demonstrate significant improvements in cognitive and social skills, such as selective attention and cooperation. González and Duñabeitia (2024) argue that multilingualism in classrooms is culturally enriching and may enhance overall learning. Thus, there is evidence suggesting that bilingual contexts influence all subjects which makes it meaningful to study further. However, not everything is positive. Potential drawbacks are interlinguistic interference, reduced verbal fluency and delays in language acquisition. It is important to keep in mind that these potential disadvantages of bilingualism may depend on various factors and do not apply universally across all cases (Ardila, 2012; Costa, 2017). Moreover, the cognitive and academic benefits of bilingualism may outweigh these potential drawbacks by positively impacting school performance and cognitive skills development across different areas of knowledge.

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However, perceptions regarding bilingual programs remain diverse. Ruiz (2023) highlights that some families believe less content is learned in subjects like History or Natural Sciences compared to non-bilingual schools. Martínez-Garrido et al. (2022) add that some parents perceive these programs as overly focused on vocabulary memorization rather than deep learning. Esparza and Belmonte (2020) note that teachers question the effectiveness of current programs. Martínez and Felices (2022) emphasize students' difficulties in understanding social content taught in English and in incorporating approaches such as addressing controversial topics.

This study aims to test Ardila's (2012) and González and Duñabeitia's (2024) claims regarding improved performance, enhanced academic development, or greater metalinguistic and metacognitive skills among bilingual individuals. Using data collected from various schools in the Autonomous Community of Castilla y León—both non-bilingual schools and those implementing SAB or PEB-BC programs—the study seeks to analyze whether bilingual education contexts significantly influence student performance in both Mathematics and S&T. Additional factors identified by existing literature as influencing academic performance will also be considered for analysis.

Method

This research employs a descriptive, cross-sectional and non-experimental quantitative methodology. It draws upon data collected by the Junta de Castilla y León about the final assessment of sixth grade in EP during 2018/2019 academic year. These data were obtained from the Directorate General of Innovation and Teacher Training of the Junta de Castilla y León upon request. The questionnaires employed (MEFP, 2019) encompassed assessments of linguistic competence in Spanish, Mathematics and S&T.

A two-stage, stratified, cluster sampling was implemented. Initially, schools were selected with a probability proportional to the number of sixth-grade students enrolled. Subsequently, two groups were chosen from each school. Stratification was based on school type (public, private, rural, urban, public and private-subsidized) and the total number of sixth-grade students per institution. These sampling characteristics, coupled with the extensive information gathered from students, teachers and families, ensure the robustness and reliability of the findings.

Sample

The sample consisted of 1,652 sixth-grade students, including 817 boys and 835 girls from 49 schools—representing 8% of the total sixth-grade student population in Castilla y León for the 2018/19 academic year. Among these students, 548 attended non-bilingual schools, 1,001 were enrolled in SAB and 103 studied in PEB-BC schools. Cognitive tests were administered to these students to assess their levels of linguistic competence (evaluating written expression and oral and written comprehension) mathematical competence, and basic competencies in S&T. This paper focuses exclusively on analyzing mathematical and S&T competencies within a bilingual education context; linguistic competence analysis is reserved for future publications.

Variables

The data provided a significant number of independent variables, many of which align with those identified in the existing literature, while others, gain relevance in light of the specific objectives established for this research (Table I).

TABLE I. Contrast variables of the study.

VARIABLE	TYPE	MEANING	VALUES
Gender	Nominal	Gender	Female, Male
Bilingual education	Nominal	Type of bilingual education in the school	Non-bilingual, SAB, PEB-BC
Setting	Nominal	Type of school by population	Urban, Rural
Type of school by ownership	Nominal	Type of school by ownership	Public, Private-Subsidized
ISEC	Quantitative	Socioeconomic and cultural index (ISEC)	Between -3 and 2

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Absences	Nominal	Frequency of unexcused full-day absences from school	1 day/week, 1 day/2 weeks, 1 day/month, never or almost never
Repetition	Nominal	Grade repeated in PE or not	Did not repeated, repeated
Homework	Ordinal	Number of days spent doing homework per week	<=1 day, 2 or 3 days, 4 or 5 days, more than 5 days

Source: Compiled by the author

The dependent variables are as follows (Table II):

TABLE II. Dependent variables of the study.

VARIABLE	TYPE	MEANING	VALUES
Mathematics performance	Quantitative	Numerical score obtained in summative evaluation	Between 119 and 775
S&T performance	Quantitative	Numerical score obtained in summative evaluation	Between 90 and 805

Source: Compiled by the author

Results

Initially, the Kolmogorov-Smirnov statistical analysis with a Lilliefors significance correction (Martínez et al., 2020) was conducted to evaluate whether the samples follow a normal distribution (Table III), which is essential for determining the type of statistical tests to be performed subsequently.

TABLE III. Kolmogorov-Smirnov analysis statistics.

	N	Normal Parameters		Maximum extreme differences			Test statistic	Asymptotic sig (two-tailed)”
		Mean	Standard deviation	Absolute	Positive	Negative		
Gender	1,645	1.56	.830	.292	.292	-.248	.292	.000[c]
Bilingual education	1,659	2.32	2.022	.305	.305	-.300	.305	.000[c]
Geographic area	1,659	1.33	.471	.428	.428	-.254	.428	.000[c]
Type of school by ownership	1,659	1.36	.480	.414	.414	-.268	.414	.000[c]
ISEC	1,659	4.76	.918	.223	.176	-.223	.223	.000[c]
Repetition	1,636	1.89	.308	.529	.365	-.529	.529	.000[c]
Absences	1,626	3.85	.503	.515	.386	-.515	.515	.000[c]
Homework	1,630	3.38	.765	.312	.207	-.312	.312	.000[c]
Performance in Mathematics	1,644	500.000	100.000	.043	.043	-.041	.043	.000[c]
Performance in S&T	1,652	500.000	100.000	.059	.053	-.059	.059	.000[c]

Source: Compiled by the author

Based on these data, we cannot affirm that these variables follow a normal distribution. Consequently, the statistical tests used to evaluate significant differences between variables will be non-parametric (Martínez et al., 2020). To select the specific test, we will consider whether or not there is a relationship between the samples. Thus, for independent samples, following Martínez et al. (2020) we will apply the Kruskal-Wallis test, which serves as a non-parametric alternative to one-way ANOVA when comparing three or more categories. Meanwhile, the Mann-Whitney U test will be appropriate for comparing two categories. These non-parametric tests imply that hypotheses (the null hypothesis, H_0, assumes that the distribution is identical across the categories of the variable) are based on ranges, medians or data distribution rather than means. However, they exhibit statistical effectiveness equivalent to parametric tests. After hypothesis testing, post hoc tests with Bonferroni correction will be conducted when the Ho is rejected to determine which specific categories exhibit differences.

Considering each variable separately, we test whether performance distribution in each subject is consistent across the categories of independent variables (Table IV and Table V).

TABLE IV. Hypothesis testing of performance distribution across the bilingual education categories, gender, geographic area and ownership.

Subject	Performance distribution is equivalent across the following categories							
	Bilingual education		**Gender**		**Geographic area**		**Type of school by ownership**	
	Sig.	**Decision**	**Sig.**	**Decision**	**Sig.**	**Decision**	**Sig.**	**Decision**
Mathematics	.100[a]	Fail to reject H_0	.0300[b]	**Reject H_0**	.250[b]	Fail to reject H_0	.014[b]	**Reject H_0**
S&T	.635[a]	Fail to reject H_0	.947[b]	Fail to reject H_0	.163[b]	Fail to reject H_0	.326[b]	Fail to reject H_0

Source: Compiled by the author
[a] Kruskal-Wallis test for independent samples
[b] Mann-Whitney U test for independent samples

TABLE V. Hypothesis testing of performance distribution across ISEC categories, average absences, repetition and homework.

Subject	Performance distribution is the same between the categories of							
	ISEC		**Average absences**		**Repetition**		**Homework**	
	Sig.	Decision	Sig.	Decision	Sig.	Decision	Sig.	Decision
Mathematics	.000[a]	**Reject H_0**	.000[a]	**Reject H_0**	.000[b]	**Reject H_0**	.003[a]	**Reject H_0**
S&T	.000[a]	**Reject H_0**	.000[a]	**Reject H_0**	.000[b]	**Reject H_0**	.000[a]	**Reject H_0**

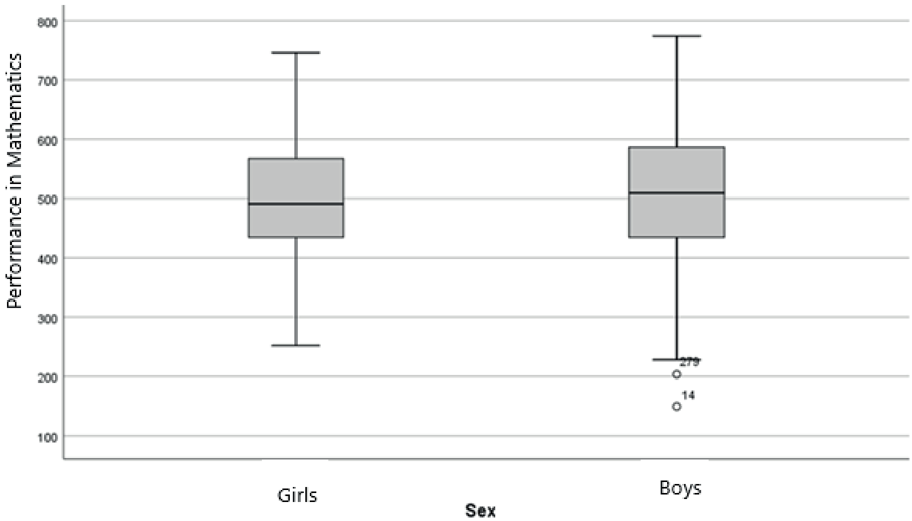
Source: Compiled by the author
[a] Kruskal-Wallis test for independent samples
[b] Mann-Whitney U test for independent samples.

For the variables **bilingual education** and **geographic area**, there is no evidence of performance differences across the respective categories: the three types of bilingual education (Non-bilingual, SAB and PEB-BC) and the two settings (rural or urban). In contrast, for the variables **Gender** and **Type of school by ownership** differences in Mathematics performance were found. Finally, the variables **ISEC, average absences, grade repetition** and **homework** show significant differences across their categories in both performances studied.

Although the test conducted to assess the individual effect of bilingual education on performance in different subjects indicated no influence, since other variables do show an impact, we consider conducting tests on smaller samples derived from the groups of values of those variables.

The hypothesis test using the Mann-Whitney U test for the gender variable showed significant differences in Mathematics performance. Figure I shows a better average rank in Mathematics for boys.

FIGURE I. Mathematics performance by gender categories.



Source: Compiled by the author

Examining performance distribution results as a function of the variable bilingual education, the data (Table VI) show differences. For girls, the type of bilingual education does not significantly influence performance in S&T or Mathematics, whereas for boys significant differences are observed in Mathematics performance.

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TABLE VI. Hypothesis testing of performance distribution across the gender and bilingual education categories.

	H_0: Performance distribution among girls is the same across the bilingual education categories.		H_0: Performance distribution among boys is the same across the bilingual education categories.	
Subject	**Sig.**	**Decision**	**Sig.**	**Decision**
Mathematics	.564[a]	Fail to reject H_0	.012[a]	**Reject H_0**
S&T	.464[a]	Fail to reject H_0	.257[a]	Fail to reject H_0

Source: Compiled by the author
[a] Kruskal-Wallis test for independent samples

Post hoc tests show that significant differences are found between boys from non-bilingual schools and boys from SABs (Table VII), with performance being higher in SABs (mean values 513.703 (SD 101.515) and 493.625 (SD 107.926), respectively).

TABLE VII. Post hoc tests for Mathematics performance in boys across bilingual education categories.

Sample 1-Sample 2	Test statistic	Standard error	Standard deviation	Sig.	Sig. Adjusted
Non bilingual–SAB	-46.906	17.929	-2.616	.009	**.027**
Non bilingual-PEB-BC	65.990	35.894	1 .838	.066	.198
SAB-PEB-BC	19.084	37.242	.512	.608	1.000

Source: Compiled by the author

The geographic area variable showed differences only in S&T performance (Table IV) across the different bilingual education categories for rural schools (Table VIII).

TABLE VIII. Hypothesis testing of performance distribution across geographic area and bilingual education categories.

	H_0: Performance distribution among urban schools is the same across bilingual education categories.		H_0: Performance distribution among rural schools is the same across bilingual education categories.	
Subject	**Sig.**	**Decision**	**Sig.**	**Decision**
Mathematics	.545 [a]	Fail to reject H_0	.590 [a]	Fail to reject H_0
S&T	.618 [a]	Fail to reject H_0	.003 [a]	**Reject H_0**

Source: Compiled by the author

[a] Kruskal-Wallis test conducted for independent samples

Among rural schools, non-bilingual schools show better performance in S&T while PEB-BC schools exhibit worse performance (Table IX).

TABLE IX. Average C&T performance in rural schools.

Type of bilingual education	Geographic area: rural	
	Performance in S&T	
	Mean	**Standard deviation**
Non bilingual	505.970	100.568
SAB	489.984	99.106
PEB-BC	459.227	71.585

Source: Compiled by the author

The ownership variable presents significant differences in Mathematics performance between public and private-subsidized schools (Table IV), with private-subsidized schools showing a better average rank than public schools (Figure II).

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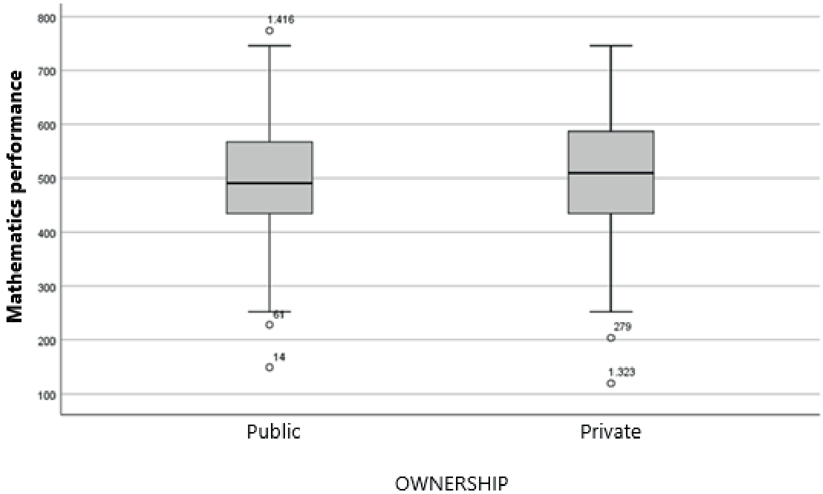
FIGURE II. Mathematics performance by ownership categories



Source: Compiled by the author

Since the sample only provides data from public bilingual schools, we can only test the potential influences of the bilingual education variable on performance in each subject for public schools, and comparisons with private-subsidized schools cannot be made. We observe that there is no influence on either of the two studied subjects' performances (Table X).

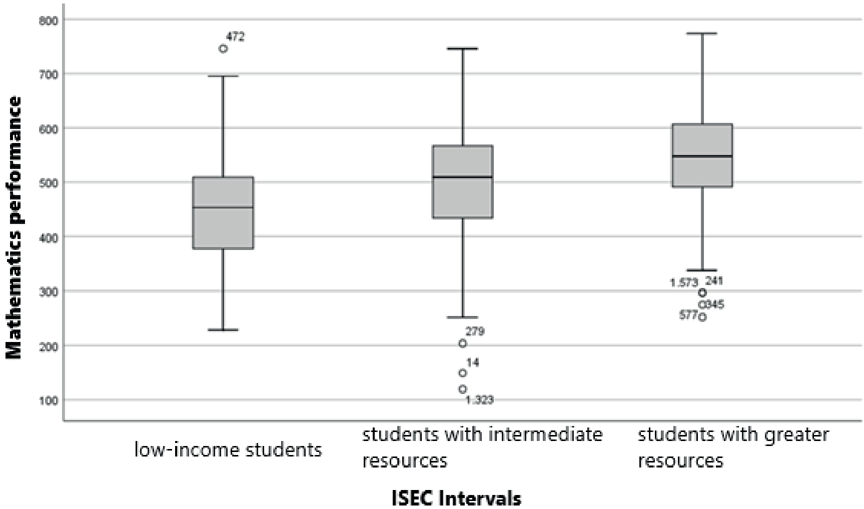
TABLE X. Hypothesis testing of performance distribution in public schools across bilingual education categories.

	H_0: Performance distribution among public schools is the same across bilingual education categories.	
Subject	**Sig.**	**Decision**
Mathematics	.620 [a]	Fail to reject H_0
S&T	.315 [a]	Fail to reject H_0

Source: Compiled by the author
[a] Kruskal-Wallis test for independent samples

The next variable studied was ISEC. According to Villar (2018), 20.4% of students in Castilla y León belong to less advantaged families, 20.1% belong to families with greater resources, and 59.5% fall within the remaining group. Using these percentages, we divided ISEC data into three intervals. The tests conducted (Table V) indicated significant differences in all performance measures relative to this variable, with interval 3 (students from families with greater resources) showing the highest performance and interval 1 (students from less advantaged families) showing the lowest performance. Thus, we can conclude that this index influences performance such that the higher the ISEC, the better the student's performance (Figure III).

FIGURE III. Performance by **ISEC intervals**



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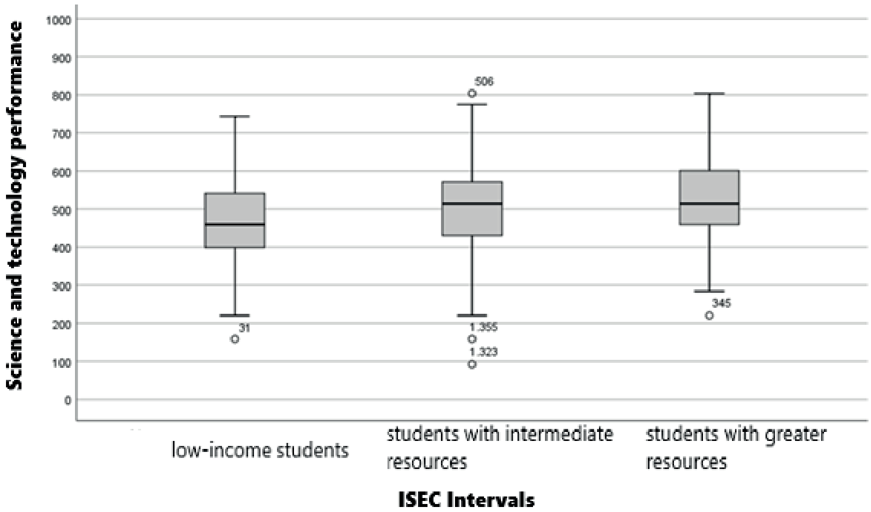


Source: Compiled by the author

Observing differences between the groups with different ISEC, we sought to determine if significant differences exist within each group based on whether they attend non-bilingual schools, SAB schools, or PEB-BC schools.

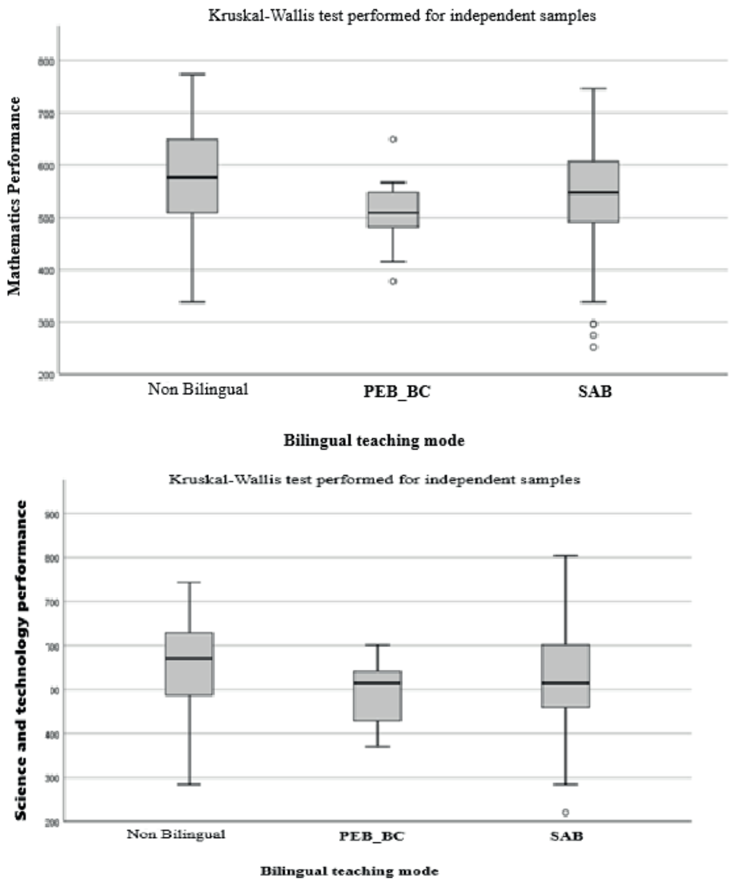
TABLE XI. Hypothesis testing of performance distribution across **ISEC** and **bilingual education** categories.

	H_0: Performance distribution among students with fewer resources is the same across bilingual education categories		H_0: Performance distribution among students with intermediate resources is the same across bilingual education categories		H_0: Performance distribution among students with greater resources is the same across bilingual education categories	
Subject	**Sig.**	**Decision**	**Sig.**	**Decision**	**Sig.**	**Decision**
Mathematics	.876 [a]	Fail to reject H_0	.857 [a]	Fail to reject H_0	.014 [a]	**Reject H_0**
S&T	.466 [a]	Fail to reject H_0	.202 [a]	Fail to reject H_0	.015 [a]	**Reject H_0**

Source: Compiled by the author
[a] Kruskal-Wallis test for independent samples

Significant differences based on the type of bilingual education were found in the group of students with greater resources only. Students from PEB-BC schools achieved lower performance scores in both subjects (Figure IV), while no significant differences were found between SAB schools and PEB-BC schools (Table XII). Non-bilingual schools achieved the best results, with significant differences compared to PEB-BC centers. Meanwhile, for students with fewer resources and those in the "remaining students" interval, no significant differences were found between the different types of schools.

FIGURE IV. Performance among students with greater resources by bilingual education modality.



Source: Compiled by the author

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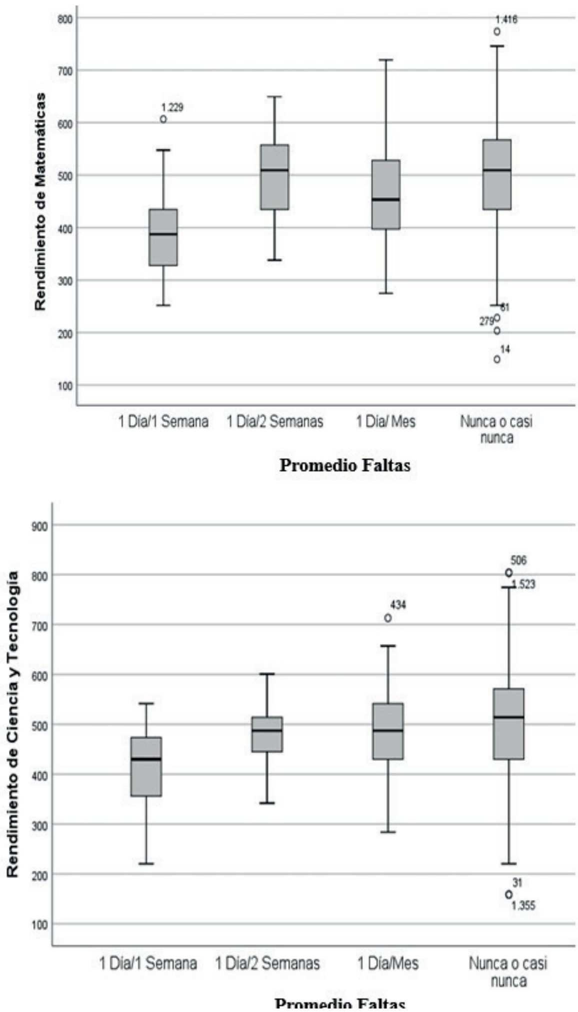
TABLE XII. Pairwise comparisons of bilingual education for students with greater resources.

Math performance	**Test statistic**	**Standard error**	**Standard test statistic**	**Sig.**	Sig. Ad-justed
PEB-BC-SAB	-40.817	25.276	-1.615	.106	.319
PEB-BC-Non bi-lingual	74.070	28.036	2.642	.008	**.025**
SAB-Non bilingual	33.253	14.684	2.265	.024	.071
Performance S&T	**Test Statistic**	**Standard error**	**Standard test statistic**	**Sig.**	Sig. Ad-justed
PEB-BC-SAB	-38.058	25.314	-1.503	.133	.398
PEB-BC-Non bi-lingual	72.260	28.081	2.573	.010	**.030**
SAB-Non bilingual	34.202	14.703	2.326	.020	.060

Source: Compiled by the author
Asymptotic significances are displayed (2-tailed tests). The significance level is .050.
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

The **average absences** variable shows significant differences in performance in the studied subjects depending on the frequency of unjustified absences from class. Figure V shows that students who "Never or almost never" miss class achieve better performance in both subjects, while those who miss class most frequently achieve the worst performance.

FIGURE V. Performance by **average absences categories**.



Source: Compiled by the author

The hypothesis test based on the bilingual education variable for each group, both for those who rarely or never miss class and for those who frequently miss class, leads to conclusions similar to those reached for this variable without considering this differentiation (Table XIII).

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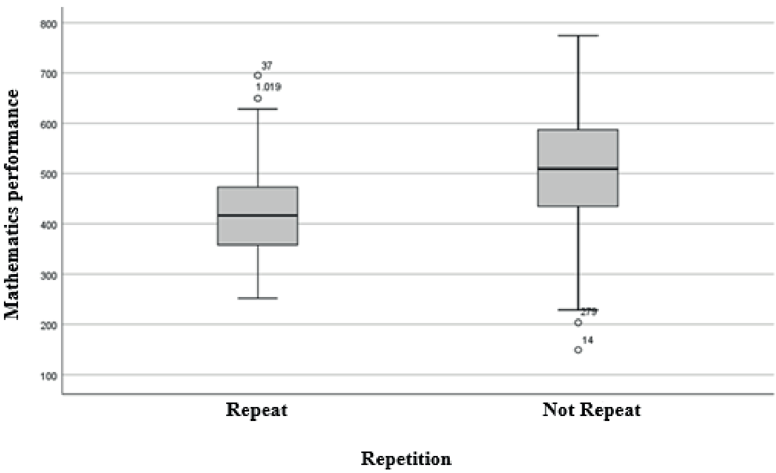
Table XIII. Hypothesis testing of performance distribution across **class absences** and **bilingual education categories**.

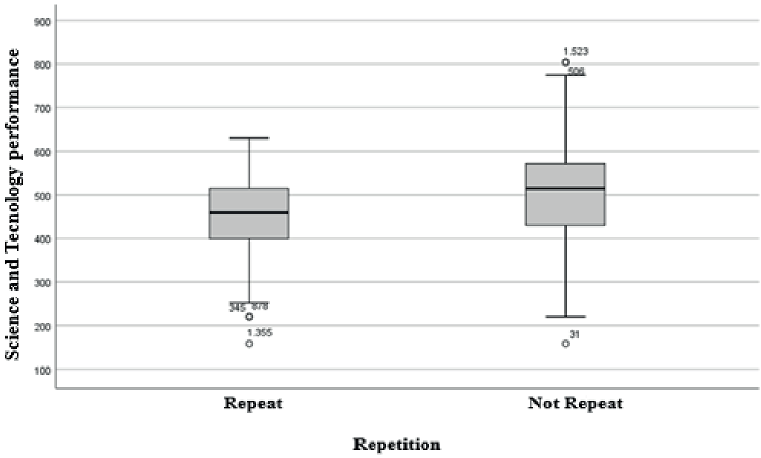
	H_0: Performance distribution among those who miss class once a week is the same across bilingual education categories		H_0: Performance distribution among those who miss class once every two weeks is the same across bilingual education categories.		H_0: Performance distribution among those who miss class once a month is the same across bilingual education categories.		H_0: Performance distribution among those who never miss class is the same across bilingual education categories.	
Subject	**Sig.**	**Decision**	**Sig.**	**Decision**	**Sig.**	**Decision**	**Sig.**	**Decision**
Mathematics	.428 [a]	Fail to reject H_0	.427 [a]	Fail to reject H_0	.221 [a]	Fail to reject H_0	.134 [a]	Fail to reject H_0
S&T	.663 [a]	Fail to reject H_0	.384 [a]	Fail to reject H_0	.588 [a]	Fail to reject H_0	.624 [a]	Fail to reject H_0

Source: Compiled by the author
[a] Kruskal-Wallis test for independent samples

When studying the **repetition** variable, it is observed that repeating a grade influences performance in all subjects. Students who repeat a grade achieve lower performance than those who do not repeat (Figure VI).

FIGURE VI. Performance by **repetition** categories





Source: Compiled by the author

The data also provide more specific insights regarding repetition, such as which grade repetition has an influence on performance. Post hoc tests were conducted to analyze this (Table XIV). It was found that repeating first grade does not influence performance in any subject, although it is true that very few students repeat this grade. For S&T performance, grade repetition in second and fourth grades was found to have an influence on performance.

TABLE XIV. *Post hoc* analysis of different performances for the **repetition** variable

	Mathematics performance			**Science and Technology performance**		
Sample1-Sample2	Test statistic	Sig	Sig. Adjusted	Test statistic	Sig.	Sig. Adjusted
1st-Not repeat	60.58	0.825	1.000	144.89	0.543	1.000
1st-2nd	379.98	0.18	1.000	234.19	0.347	1.000
1st-3rd	378.29	0.18	1.000	63.03	0.799	1.000
1st-4th	-289.89	0.31	1.000	-124.74	0.62	1.000
1st-5th	430.83	0.133	1.000	85.50	0.736	1.000
1st-6th	460.83	0.127	1.000	196.14	0.467	1.000
2nd-Not repeat	440.56	**0.000**	**0.000**	379.08	**0.000**	**0.000**

2nd-3rd	-1.69	0.987	1.000	-171.16	0.088	1.000
2nd-4th	90.08	0.410	1.000	109.46	0.318	1.000
2nd-5th	-50.86	0.654	1.000	148.69	0.191	1.000
2nd-6th	80.86	0.580	1.000	-38.05	0.795	1.000
3º-Not repeat	438.87	**0.000**	**0.000**	207.92	0.003	0.080
3rd-4th	88.40	0.408	1.000	-61.70	0.563	1.000
3rd-5th	-52.54	0.635	1.000	-22.47	0.839	1.000
3rd-6th	-82.54	0.547	1.000	-133.11	0.367	1.000
4th-Not repeat	350.47	**0.000**	**0.001**	269.63	**0.001**	**0.030**
4th-5th	140.94	0.235	1.000	-39.24	0.742	1.000
4th-6th	170.94	0.256	1.000	71.41	0.636	1.000
5th-Not repeat	491.41	**0.000**	**0.000**	230.39	0.009	0.241
5th-6th	30.00	0.845	1.000	110.64	0.472	1.000
6th-Not repeat	521.41	**0.000**	**0.001**	341.03	0.008	0.212

Source: Compiled by the author

Further analysis in the context of bilingual education for the repetition variable reveals that performance in the studied subjects is not influenced by whether or not they receive bilingual education (Table XV).

TABLE XV. Hypothesis testing of performance distribution across **repetition** and **bilingual education** categories

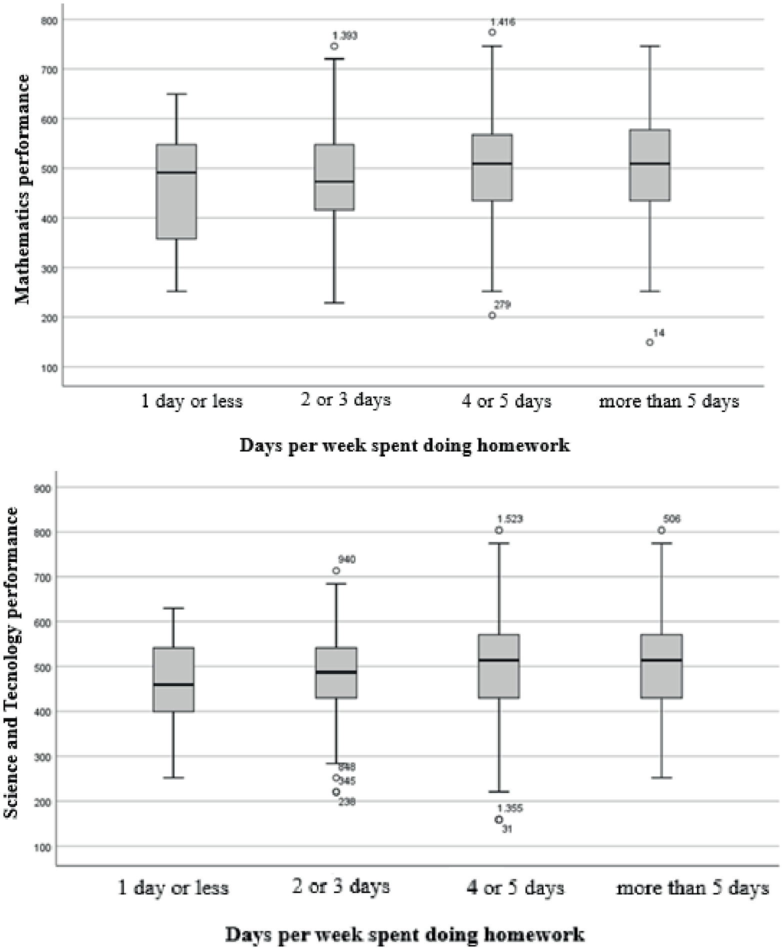
	H_0: Performance distribution among non-repeaters is the same across bilingual education categories.		H_0: Performance distribution among repeaters is the same across bilingual education categories.	
Subject	**Sig.**	**Decision**	**Sig.**	**Decision**
Mathematics	.360 [a]	Fail to reject H_0	.789 [a]	Fail to reject H_0
S&T	.312 [a]	Fail to reject H_0	.464 [a]	Fail to reject H_0

Source: Compiled by the author

[a] Kruskal-Wallis test for independent samples

Finally, the homework variable indicates that dedicating more or less time to homework influences performance in the studied subjects (Table V). Students achieve better performance as they dedicate more days to completing homework (Figure VII).

FIGURE VII. Performance by homework categories



Source: Compiled by the author

For groups of students dedicating different numbers of days to homework, the bilingual education variable influences S&T performance among those who dedicate 2 or 3 days to homework (Table XVI).

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TABLE XVI. Hypotheses testing of performance distribution across **homework** and **bilingual education** categories.

	H_0: Performance distribution among those who dedicate 1 day to homework is the same across bilingual education categories		H_0: Performance distribution among those who dedicate 2 or 3 days to homework is the same across bilingual education categories		H_0: Performance distribution among those who dedicate 4 or 5 days to homework is the same across bilingual education categories		H_0: Performance distribution among those who dedicate more than 5 days to homework is the same across bilingual education categories	
Subject	**Sig.**	**Decision**	**Sig.**	**Decision**	**Sig.**	**Decision**	**Sig.**	**Decision**
Mathematics	.702 [a]	Fail to reject H_0	.244 [a]	Fail to reject H_0	.365 [a]	Fail to reject H_0	.336 [a]	Fail to reject H_0
S&T	.515 [a]	Fail to reject H_0	.017 [a]	**Reject H_0**	.842 [a]	Fail to reject H_0	.340 [a]	Fail to reject H_0

Source: Compiled by the author

[a] Kruskal-Wallis test performed for independent samples

After conducting post hoc tests (Table XVII), significant differences were only observed in the following cases: for S&T, the highest performance was observed in PEB-BC schools (Mean = 534.468, SD = 64.989) and the lowest performance in SABs (Mean = 461.523, SD = 99.578).

TABLE XVII. Post hoc tests for homework by bilingual education **categories.**

	S&T performance among those who dedicate 2 or 3 days to homework				
Sample 1-Sample 2	Test. statistic	Standard. error	Standard test statistic	Sig.	Sig. Adjusted
PEB-BC–Non bilingual	-30.316	11.984	-2.53	.011	**.034**
PEB_BC–SAB	32.741	11.445	2.837	.005	**.014**
Non bilingual-SAB	2.155	7.195	.299	.765	1.000

Source: Compiled by the author

Discussion

The results of this study initially suggest that the context of bilingual education does not significantly influence academic performance in non-linguistic subjects always taught in Spanish, such as Mathematics, or in non-linguistic subjects like S&T, which are taught in English or Spanish, depending on the type of school. No differences were found between non-bilingual, SAB schools or PEB-BC schools.

A more detailed analysis, resulting from the consideration of other factors, reveals differences in Mathematics performance related to gender across schools with different bilingual education modalities. This research confirms that boys from SAB schools excel in Mathematics compared to boys from non-bilingual schools and girls. This finding aligns with the studies of Echavarri et al. (2007) and Pozo-Burgos et al. (2022) which indicate that men and women employ different strategies to solve complex problems. Men tend to use spatial and abstract reasoning, while women rely on verbal strategies.

Better performance in Mathematics in bilingual schools, where it is never taught in English, may be justified by the reasons argued by Ardila (2012): greater cognitive control, mental plasticity, better results in non-verbal tasks, greater academic achievement or a superior development of mental resources.

Regarding S&T performance which is not taught in English in non-bilingual schools but is predominantly taught in English in SABs (Vega-Agapito et al., 2021) and entirely taught in English in PEB-BC schools, (Falcón-Díaz et al., 2019), the results did not show significant differences between the types of bilingual education (SAB, PEB-BC, non-bilingual), This suggests that bilingual education, at least in the context of this study, does not significantly affect performance in this area. The lack of differences in S&T performance could be related to the fact that this area typically involves both logical reasoning and the use of technical vocabulary, which may not be significantly affected by the linguistic context, especially in partial bilingual programs where the language of instruction for science may vary. This is particularly true for SABs, were science may be taught in either English or Spanish (Vega-Agapito et al., 2021).

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Other factors do emerge as influential on S&T performance. As noted by Pozo-Burgos et al. (2022), differences were found related to socioeconomic environments. According to these authors, a high socioeconomic environment supports superior performance in areas like science. Regular attendance at school is also positively related to performance in S&T since, as Ndjangala et al. (2021) highlight, missing class prevents students from keeping up with content and benefiting from practical explanations often required for these subjects. Additionally, students who repeat grades tend to show lower performance in S&T, possibly due to difficulties in acquiring basic skills at earlier stages, which impacts their ability to follow advanced scientific content .

Another factor—the time dedicated to completing homework—shows a direct relationship with S&T performance: students who practice and review concepts at home consolidate their learning more effectively. This relationship between homework dedication and performance is consistent with the theory that constant reinforcement of concepts allows students to integrate scientific knowledge more effectively (Willms, 2010).

Overall, we found that absenteeism has a negative impact on academic performance, especially when students frequently miss classes. Similar to Custodio et al. (2022) frequent absences is a significant negative influence on academic performance for those with high levels of absenteeism, disconnecting them from the school environment and the role of teachers. This finding underscores the need for interventions aimed at reducing absenteeism to improve educational outcomes.

Finally, the study shows that students who dedicate more time to homework tend to achieve better results across all subjects. This finding emphasizes the importance of study habits and time management for academic success and suggests that both parents and teachers should encourage consistent study routines. Murillo and Martínez-Garrido (2013) found that among third-grade primary students from nine Latin American countries, their academic performance improved when homework was assigned for completion at home, and subsequently reviewed in class; however, neither the time spent on homework nor its frequency or type were as relevant as its review process.

These results contrast with findings for China by Zhibin (2024) who showed that students in bilingual programs significantly outperformed their peers in monolingual programs with substantial academic gains. This aligns with the studies by Chamorro and Janke (2022) conducted in Spain. Similarly, studies by Tennakoon (2024) for Sri Lanka report cognitive benefits and enriched learning for bilingual programs, but note dependencies on factors such as teacher quality, curriculum design and socio-economic conditions.

Conclusions

While it initially appears that a bilingual education context does not significantly influence performance in S&T, even though it is predominantly taught in English, it may have an impact on areas that are not taught in English, such as Mathematics. Instruction in a second language could add a cognitive load that affects performance in analytical areas, suggesting the need for differentiated approaches based on gender. This includes encouraging the development of analytical skills among girls and the strengthening linguistic skills among boys.

This study is based on a sample of schools in Castilla y León, which limits the generalization of the findings to other educational contexts with different policies and resources. In Spain, there are several bilingual autonomous communities with two co-official languages, so in them, the educational context would be trilingual rather than bilingual. This scenario was not considered in our research, conducted in a monolingual community; therefore, we cannot extend the validity of our results to those regions. Future studies should expand the sample to include data from other autonomous communities, both monolingual and those with a second co-official language. Additionally, the cross-sectional nature of the study does not allow for an analysis of changes over time. Longitudinal studies in the future would help to better understand the long-term impact of bilingual education on academic performance by evaluating students over several years.

Another limitation was the reliance on performance data based on standardized tests, which may not fully capture all dimensions of learning. Further work could provide interesting insights by using an ad hoc, non-standardized questionnaire that evaluates all dimensions.

It would be also valuable to incorporate classroom observation methods to

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analyze how bilingual interactions affect learning in real time. Furthermore, studying the role of additional variables, such as students' self-concept and motivation, could offer a more comprehensive view of the factors influencing performance in schools with bilingual education programs.

Finally, expanding the study to include teachers by conducting a competency evaluation of teachers in bilingual schools and recording their perception of bilingual programs would provide further insights.

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Bibliographic References

Agraso, A. D., García, E., Carrillo, P. J., & Moral, J. E. (2021). Relación entre la enseñanza bilingüe en educación física con el rendimiento académico y nivel de práctica de actividad física. *Papeles salmantinos de educación,* (25), 117-139.

Ambussaidi, I., & Yang, Y. F. (2019). The impact of mathematics teacher quality on student achievement in Oman and Taiwan. *International Journal of Education and Learning, 1*(2), 50-62.

Ardila, A. (2012). Ventajas y desventajas del Bilingüismo. *Forma y Función vol. 25*(2), 99-114.

Báez, I. y González, L. (2013). El mismo contexto, pero distintas lenguas:

Received: 03/12/2024 Accepted: 03/03/2025

el español y la lengua de signos española. En Blecua, B., Borrell, S., Crous, B. y Sierra, F. (Eds). *Plurilingüismo y enseñanza de ELE en contextos multiculturales* (1ª Edición, 123-133). Asociación para la Enseñanza del Español como Lengua Extranjera. https://dialnet.unirioja.es/descarga/libro/562312.pdf

Baker, C. & Right, W.E. (2021). *Foundations of bilingual education and bilingualism.* (7th ed). Multilingual matters.

Barreto, F., & Álvarez, J. (2017). Clima escolar y rendimiento académico en estudiantes de preparatoria. *Daena: International Journal of Good Conscience, 12*(2), 31-44.

BOE. (2013). *Ley Orgánica 8/2013, de 9 de diciembre, para la mejora de la calidad educativa*, num,295, de 10 de diciembre de 2013. https://www.boe.es/eli/es/lo/2013/12/09/8/con

BOE (2020). *Ley Orgánica 3/2020, de 29 de diciembre, por la que se modifica la Ley Orgánica 2/2006, de 3 de mayo, de Educación.* https://www.boe.es/boe/dias/2020/12/30/pdfs/BOE-A-2020-17264.pdf

BOMEC. (1996). *Resolución de 1 de marzo de 1996, de la dirección General de Centros Escolares, por la que se crean secciones bilingües en determinados colegios de educación infantil y primaria*. BOMEC, n. 12, de 8 de marzo de 1996.Buckman, D. G., Hand, N. W., & Johnson, A. (2021). Improving high school graduation through school climate. *NASSP Bulletin, 105*(1), 5-24.

Caballero, C., Abello, R. & Palacio, J. (2007). Relación de burnout y rendimiento académico con la satisfacción frente a los estudios en estudiantes universitarios. *Avances en Psicología Latinoamericana, 25*(2), 98-111. Recuperado de http://www.scielo.org.co/pdf/apl/v25n2/v25n2a7.pdf

Castejón, J. L., & Vera-Muñoz, M. I. (1996). A causal model about the individual and contextual determinates of academic achievement. *The High School Journal*, *80*(1), 21-27.

Consejería de Educación, Ciencia y Universidades. (2023), *Madrid, comunidad bilingüe 2022-2023.* https://www.comunidad.madrid/transparencia/sites/default/files/plan/document/bvcm050930.pdf

Costa, A. (2017). *El cerebro bilingüe. La neurociencia del lenguaje*, Pen-

Received: 03/12/2024 Accepted: 03/03/2025

guin Random House.

Custodio, N. F., Pintor, M. D. y Pérez, J. D. C. (2022). Absentismo escolar y snappet: diferencias en el rendimiento académico en matemáticas. *Revista de Educación Inclusiva, 15*(2), 130-146.

Chamorro, G., & Janke, V. (2022). Investigating the bilingual advantage: The impact of L2 exposure on the social and cognitive skills of monolingually-raised children in bilingual education. *International Journal of Bilingual Education and Bilingualism*, *25*(5), 1765-1781.

Chaparro, A., González, C. y Caso, J. (2016). Familia y rendimiento académico: configuración de perfiles estudiantiles en secundaria. *Revista Electrónica de Investigación Educativa, 18*(1), 53-68. Recuperado de http://redie.uabc.mx/redie/article/view/774

Chávez-Becerra, M., Flores-Tapia, M., Castillo-Nava, P., & Méndez-Lozano, S. (2020). El autoconcepto en universitarios y su relación con rendimiento escolar. *Revista de Educación y Desarrollo, 53*(1), 37-47.

De la Torre, C., & Ávila, A. G. (2002). Influencia de las atribuciones causales del profesor sobre el rendimiento de los alumnos. *Psicothema, 14*(2), 444-449.

Echavarri, M., Godoy, J.C., & Olaz, F. (2007). Differencias de género en habilidades cognitivas y rendimiento académico en estudiantes universitarios. *Universitas Psychologica, 6*(2), 319-329

Edel, R. (2003). El rendimiento académico: concepto, investigación y desarrollo. REICE. *Revista Iberoamericana sobre Calidad, Eficacia y Cambio en Educación, 1*(2), 1-16. https://www.redalyc.org/pdf/551/55110208.pdf

Esparza, C. M. y Belmonte, M. L. (2020). Percepción docente sobre el bilingüismo en centros de Educación Infantil y Educación Primaria de la Región de Murcia. *Revista Complutense de Educación, 31*(2), 251-260

Falcón-Díaz, A, Jiménez-Vivas, A., & Urchaga-Litago, J. D. (2019). El programa bilingüe MECD-British Council, más de dos décadas de innovación educativa. *Papeles Salmantinos De educación*, (23), 83–106. https://doi.org/10.36576/summa.108388

Received: 03/12/2024 Accepted: 03/03/2025

García, A., Calvo, P. y Marrero, G. (2006). La autoestima en alumnos de sexto curso de educación primaria. En F. Bacaicoa y J. Uriarte (Eds.). *Psicología del Aprendizaje*, INFAD (pp. 199-215). Psicoex Badajoz. Recuperado de: https://bit.ly/3n7PZ3J

Glick, P., Randrianarisoa, J.C. y Sahn, D.E. (2011). Family background, school characteristics, and children's cognitive achievement in Madagascar. *Education Economics, 19*(4), 363-369. https://doi.org/10.1080/09645292.2010.488476

González Alonso, J. y Duñabeitia, J.A. (2024). Family Attitudes towards Multilingualism in Bilingual Education Programs and Their Relationship with Academic Performance. *Behavioral Sciences, 14*, 6. https://doi.org/10.3390/bs14010006,

González, C., Caso, J., Díaz, K., y López, M. (2012). Rendimiento académico y factores asociados. *Aportaciones de algunas evaluaciones a gran escala. Bordón, 64*(2), 51-68.

Grasso, P. (2020). Rendimiento académico: un recorrido conceptual que aproxima a una definición unificada para el ámbito superior. *Revista de Educación, 20*, 87-102.

Martínez Frías, A. & Felices de la Fuente, M. M. (2022). Bilingüismo en Educación Primaria. Un estudio de caso sobre la enseñanza de las Ciencias Sociales. *ENSAYOS, 37*(1), 51-66. https://doi.org/10.13042/Bordon.2022.9393

Martínez-Garrido, C., Hidalgo, N. y Moreno-Medina, I. (2022). El debate del bilingüismo. Percepciones de las familias sobre el Programa Educativo Bilingüe en la Comunidad de Madrid. *Bordón, Revista de Pedagogía, 74*(3), 35-50. https://doi.org/10.13042/Bordon.2022.9393

Martínez, M.A., Sánchez-Villegas, A., Toledo, E. y Faulin, J. (2020). *Bioestadística amigable.* Elsevier.

Martínez-Otero, V. (2007). *Los adolescentes ante el estudio. Causas y consecuencias del rendimiento académico*. Fundamentos.

MECD. (2015). *Marco general de la Evaluación final de Educación Primaria*. https://sede.educacion.gob.es/publiventa/marco-general-de-la-evaluacion-final-de-educacion-primaria/educacion-infantil-y-primaria-evaluacion-lectura-matematicas/20622

MEFP. (2019). *Pruebas de la evaluación final de 6.º curso de Educación Primaria. CURSO 2018-2019*. https://www.libreria.educacion.gob.es/ebook/177191/free_download/

Mohr, K. A., Juth, S. M., Kohlmeier, T. L., & Schreiber, K. E. (2018). The developing bilingual brain: What parents and teachers should know and do. *Early Childhood Education Journal, 46*(1), 11-20

Molina, M.J. (2003). Fundamentos teóricos de la educación bilingüe. *Aldaba, 31,* 127-138. https://dialnet.unirioja.es/descarga/articulo/1975779.pdf

Murillo, F. J., & Martínez-Garrido, C. (2013). Homework Influence on academic performance. A study of Iberoamerican students of Primary Education. *Revista de Psicodidáctica, 18*(1), 157-171. DOI: 10.1387/RevPsicodidact.6156

Ndjangala, M. N. N., Abah, J., & Mashebe, P. (2021). Teachers' Views on Challenges Affecting Learners' Performance in Natural Science. *International Journal of Evaluation and Research in Education*, *10*(1), 48-56.

Pavón, V. (2018). La controversia de la educación bilingüe en España. *Revista Tribuna Norteamericana, 26*, 20-27.

Pozo-Burgos, E.J., Burbano-Pulles, M.R., Vidal-Chica, J.I., & Revelo-Salgado, G.E. (2022). Sociocultural and demographic factors that influence academic performance: The pre-university case of the Universidad Politécnica Estatal del Carchi. *Journal of Technology and Science Education, 12*(1),147-156. https://doi.org/10.3926/jotse.1359

Redondo, M. P., & Jiménez, L. K. (2020). Autoconcepto y rendimiento académico en estudiantes de secundaria en la ciudad de Valledupar-Colombia. *Revista espacios, 41*(09).

Ruiz Cordero, M. B. (2023) La opinión de las familias sobre el programa bilingüe de la Comunidad de Madrid. *La Guiniguada, 32*, 60-78Tejada, B. O. M. (2018). *El nivel de autoestima y su influencia en el rendimiento escolar de los estudiantes de secundaria de la Institución Educativa Francisco Javier de Luna Pizarro-Miraflores 2018* [Doctoral dissertation]. Universidad Nacional de San Agustín.

Tejedor, F. (2003). El poder explicativo de algunos determinantes del rendimiento en los estudios universitarios. *Revista Española de Pedagogía, 61*(224), 5-32

Tennakoon, T.M.A.S. (2024). Comparative Analysis of Academic Performance: Bilingual Education vs. Monolingual Education. *International Journal of Recent Advances in Multidisciplinary Research, 11*(04), 9754-9757.

Torres, L. E. y Rodríguez, N. Y. (2006). Rendimiento académico y contexto familiar en estudiantes universitarios. *Enseñanza e Investigación en Psicología, 11*(002). 255-270.

Torres Díaz, S. E., Hidalgo Apolo, G. A., & Suarez Pesantez, K. V. (2020). Habilidades sociales y rendimiento académico en adolescentes de secundaria. *Horizontes Revista de Investigación en Ciencias de la Educación, 4*(15), 267-276

Vega-Agapito, M.V., Arias García, J.R. y Delgado Iglesias, J. (2021). Estudio observacional descriptivo de los centros de Educación Primaria con enseñanza bilingüe y no bilingüe de la provincia de Valladolid. En Universidad de Córdoba y APICE (Eds.), *29 Encuentros de Didáctica de las Ciencias Experimentales* (pp. 1086-1094). Universidad de Córdoba. http://apice-dce.com/wp-content/uploads/2021/04/Actas-de-los-29edce.pdf

Vilches, M.A., Bustamante, M.A. y Álvarez, A.J. (2018). Rendimiento académico y evaluación docente. *Revista empresarial, 46*, 4-11. https://dialnet.unirioja.es/descarga/articulo/7021670.pdf

Villar, A. (2018). Rendimiento, equidad y calidad: el desarrollo educativo en España según PISA 2015. *Cuadernos económicos del ICE, 95*, 79-97

Vinuesa, V. e Izquierdo, E. (2019). Mitos y realidades sobe la educación bilingüe. *Revista Espacios, 40*(21), 18-25.

Willms, J. (2010). School composition and contextual effects on student outcomes. *Teachers College Record, 112*(4), 1008 - 1037.

Zambrano-Mendoza, Y. Y. A., Campoverde-Castillo, A. C. C., & Idrobo-Contento, J. C. (2019). Importancia entre la comunicación padres e hijos y su influencia en el rendimiento académico en estudiantes de bachillerato. *Polo del Conocimiento: Revista científico-profesional,*

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4(5), 138-156.

Zhibin, L. (2024). A Management Perspective on Academic Achievement: The Impact of Bilingual Education Policies in Chinese Primary Schools. *Peta International Journal of Social Science and Humanity, 3*(1), 1-18.

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