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Perceptions of 6th grade Primary School students in Natural, Social and Cultural Knowledge: linguistic communication competence, textbook and digital resource

Percepciones de los estudiantes de 6.º de Educación Primaria en Conocimiento del Medio Natural, Social y Cultural: competencia en comunicación lingüística, libro de texto y recursos digitales

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ABSTRACT
Competence in linguistic communication (CLC) is fundamental in the teaching and learning process in linguistic and non-linguistic areas, so its development is essential in all disciplines. In this sense, the International Study of Trends in Mathematics and Science states that low levels in science are directly related to low levels of reading comprehension, and that negative results in science need to be tackled through CLC. Furthermore, there is research suggesting that failure in science is due to the overuse of the textbook. In this sense, the aim of the present study is to analyse the beliefs and attitudes of 170 students in the 6th year of Primary Education about the subject of Natural, Social and Cultural Knowledge (NSC) in relation to CLC and its relationship with the teaching materials -textbooks and technological resources-. As for the methodology, the approach is non-experimental quantitative, and the results have been obtained through a questionnaire divided into 4 dimensions and 53 initial items. The results suggest that students value the NSC subject and the technological resources positively. In conclusion, the data obtained are useful for the design of interventions to improve the teaching of NSC.

RESUMEN
La competencia en comunicación lingüística (CCL) resulta fundamental en el proceso de enseñanza y aprendizaje de las áreas lingüísticas y no lingüísticas, por lo que su desarrollo es imprescindible desde todas las disciplinas. En este sentido, Estudio Internacional de Tendencias en Matemáticas y Ciencias expone que el bajo nivel en ciencias tiene relación directa con el bajo nivel de comprensión lectora, siendo necesario enfrentar los resultados negativos en ciencias desde la CCL. Además, existen investigaciones que sugieren que el fracaso en ciencias se debe al uso excesivo del libro de texto. En esta dirección, el objetivo del presente estudio es analizar las creencias y actitudes que tienen 170 estudiantes de 6.º de Educación Primaria sobre la asignatura de Conocimiento del Medio Natural, Social y Cultura (CMN) con relación a la CCL y su relación con los materiales docentes —libros de texto y recursos tecnológicos—. En cuanto a la metodología, el enfoque es cuantitativo no experimental y los resultados se han obtenido a través de un cuestionario dividido en 4 dimensiones y 53 ítems iniciales. Los resultados sugieren que los estudiantes valoran positivamente la asignatura CMN y los recursos tecnológicos. En conclusión, los datos obtenidos son de utilidad para el diseño de intervenciones que mejoren la enseñanza de CMN.

KEYWORDS · PALABRAS CLAVES · KEYWORDS
Competencia lingüística; Materiales de instrucción; Tecnología educativa; Actitudes de los estudiantes; Estudiantes de educación primaria; Linguistic Competence; Instructional Materials; Educational Technology; Student Attitudes; Elementary School Students

1. Introduction

The development of Linguistic Communication Skills (CCL, as per its Spanish acronym) is essential to the academic success of primary school students, as there is a link between students' linguistic deficiencies and academic failure (Romero-Oliva & Trigo-Ibáñez, 2015). The reason is that CCL facilitates access to other skills and knowledge, both in linguistic areas (LA) and non-linguistic areas (NLA), so that students who master the CCL will achieve better academic performance in other curricular areas (Romero-Oliva et al., 2018; Campollo-Urkiza & Cremades-Andreau, 2022; Trigo-Ibáñez et al., 2021). For all these reasons, the legal and regulatory framework for education urges schools to implement measures aimed at improving CCL, as enhancing CCL has a significant impact on future success (Rincón-González, 2021).

In line with the above idea, Organic Act 3/2020, of 29th December, amending Organic Act on Education 2/2006, of 3rd May, (LOMLOE, as per its Spanish acronym), emphasises that 'schools shall adopt the necessary measures to compensate for any shortcomings that may exist in linguistic communication skills'. Likewise, point 3 of the thirty-eighth additional provision states that it must be ensured that all students achieve a good CCL command due to the influence this skill has on other skills.

Continuing in the same vein, the preamble to the LOMLOE (2020) highlights the importance of developing language skills, specifically reading comprehension. Furthermore, point 2 of Article 19, 'Pedagogical principles,' highlights the importance of promoting oral expression and comprehension, written expression, digital competence, and scientific spirit.

With regard to the implementation of the curriculum at the regional level in Andalusia, Decree 101/2023, of 9th May, stipulates that reading is a key factor in the development of other skills, and therefore 'all areas will include activities and tasks for the development of linguistic communication skills', since, according to the aforementioned Decree and Royal Decree 157/2022, of 1st March, LCC is 'the basis for independent thinking and for the construction of knowledge in all spheres of learning'.

In summary, the legal and regulatory framework for education in Spain in general, and in Andalusia in our case, indicates that it is extremely important to develop CCL due to its influence on other areas of the curriculum, whether AL or ANL, as it is considered a cross-curricular and key competence for academic success (Jaén & Flores, 2020). Additionally, basic technological skills and scientific spirit are highlighted, emphasising that these aspects must be developed across all areas of the curriculum, as they are interdisciplinary.

At this point, it would be useful to define what CCL is. According to Jaén and Flores (2020), it is the skill that enables a person to use language appropriately, allowing them to understand linguistic procedures. On the other hand, Calatrava (2016), cited in Jaén and Flores (2020, p. 4), defines it as the ability to 'use language as an instrument of oral and written communication, representation, interpretation, and understanding of reality.'

Continuing with the idea that CCL is key to students' academic success, even in ANLs, Romero et al. (2018) explain that this is due to three fundamental characteristics: CLC is cross-curricular, making it the transdisciplinary core of all areas of the curriculum; it is instrumental, as mastery of receptive and productive language is the basis for accessing and developing knowledge in all subjects; and it is interdisciplinary, because, according to Granda-Asencio (2023), Romero-Oliva et al. (2020) and Romero-Oliva et al. (2021), reading is the foundation for accessing various educational skills, thereby ensuring access to knowledge of AL and ANL.

With regard to the importance of CCL for success in ANLs, especially in science, several studies show that the development of language skills, such as reading comprehension, has an impact on ANLs. For example, research by Heredia-Ponce et al. (2024) demonstrated the link between reading comprehension levels and mathematical problem-solving skills. Other research demonstrating the link between this skill and success in ALs and ANLs includes Alvarado (2023), Cordova et al. (2021) and Valdez (2021).

Similarly, written expression skills contribute effectively to the meaningful learning of scientific terms, as evidenced by Navarro et al. (2020), who believe that writing must be learned because of its importance for learning. Other research linking the development of written expression and science learning includes Anastasio (2020); Muñoz-Álvarez and Pérez-López (2020); and López-Isi (2021).

Similarly, oral expression is a skill that is essential for effective learning of science in primary education, as it is a fundamental aspect of accessing scientific content and thus developing scientific competence (Domènech Casal, 2021).

In summary, science learning in primary education requires the development of CCL, as there is a relationship between the level of CCL and academic success. This highlights the need to develop oral and written communication skills using a communicative and functional approach in all areas of the curriculum (Fabregat, 2020; Cassany et al. 2014). Furthermore, the results of the TIMMS report show that low levels in science are directly related to reading comprehension levels (Spanish Ministry of Education and Vocational Training (MEFP), 2020), making it necessary to address the improvement of these results through the development of CCL (Romero-Oliva & Trigo-Ibáñez, 2018). Furthermore, learning science requires CCL due to the complex communication processes that arise from the particularities of scientific texts (Torres-Jaimes, 2015). In short, we are referring to a model based on the theory of Communication-Based Learning (CBL), which takes its foundations from Brune's discovery learning (1972) through interaction between teachers and students, where language becomes an instrument of cohesion and participation in the classroom, serving as a space for debate for the construction of knowledge and access to information through resources and strategies focused on motivation.

Resources are a key element: despite criticism, the scientific texts presented to primary school students mostly come from textbooks, as they are the teaching resource most used by teachers, acting as a guide and support in decision-making (Suárez-Ramírez & Suárez-Ramírez, 2020).

However, textbooks are not only guided by educational principles, but also commercial ones, which can lead to inappropriate texts, conceptual errors, inadequate terminology, poor contextualisation of information, and distorted perceptions of scientific knowledge resulting from mistranslations or poor oversight by those who review their content (Occelli & Valeiras, 2013; Pino-Fan et al. 2024). This resource, in itself, acts more as a vehicle for knowledge than as an opportunity to generate it, as there are few activities that promote scientific inquiry, preventing learning through interaction between peers and the interpretation of reality. This raises questions about its excessive use in science teaching and prompts consideration of other more appropriate teaching materials and methods (Aragüés, 2021; Molina-Puche & Alfaro-Romero, 2019).

Several studies have attempted to link textbooks in order to address this issue, as the most widely used resource, with technology. To give an example, the research conducted by Buendia-Barbera & Holgado-García (2022) involved digitising printed textbook readings

and enriching them with hyperlinks to help students understand the content of the book and relate it to their prior knowledge. Similarly, Sánchez-Serrano et al. (2018) determined that most students preferred digital readings designed with UDL Book-Builder to the same readings in print format from textbooks. This research reflects how shortcomings in textbooks can be addressed by incorporating digital elements that act as substitutes or supplements.

In relation to the idea previously mentioned, Information and Communication Technologies (ICTs) have changed the way we receive and convey information. As a result, literacy and reading skills have changed, as they no longer only take into account printed texts in textbooks, but also new media such as hypertext reading in digital textbooks. Furthermore, these digital texts from physical textbooks increase motivation to read, facilitate reading comprehension and encourage collaborative learning (Ascencio-Gonzáles et al., 2023; Neva-Ocasión, 2021).

In summary, digital teaching materials generate an enriching experience in the teaching and learning process for students. Specifically, digital or electronic textbooks represent remarkable learning environments. These types of textbooks represent the digital transformation of society and, therefore, of school textbooks in paper format, as they are structured books with a comprehensive educational approach to content and activities, designed for specific subjects and courses. Similarly, digital textbooks, like traditional textbooks, are also produced industrially and allow teachers to manage their classes systematically. However, unlike traditional textbooks, digital textbooks are more flexible and adaptable to the characteristics of the teacher and the students in the class (Hernández-Hechevarría et al., 2021).

From this perspective, the implementation of technological resources in science classes is interesting, as ICTs promote critical thinking through communication skills. Furthermore, they contribute to a more active learning model for students, offering them skills in accessing, selecting, organising and synthesising data through key aspects of science learning such as critical and reflective thinking (Calsin-Ramos, 2022; Cruz-Picón & Hernández-Correa, 2021). In this vein, ICTs enable the development of multimodal materials, which stimulate and attract students' attention by expanding resources beyond alphabetical text, allowing audio and video as elements that enrich learning and contribute to the inclusion of all students by considering Universal Design for Learning (UDL) principles, providing means of representation, action and expression, and motivation and commitment (Calderón-Núñez, 2022; Cabero-Almenara & Ruíz-Palmero, 2017; Aguinaga, 2022).

In conclusion, ICTs give rise to new educational dynamics that reconfigure the role of teachers as guides and promote more active methodologies in the field of science, generating motivation and interest among students and encouraging student interaction through working groups or debates (Largo-Taborda et al., 2021; Cansigno-Gutiérrez, 2020).

Therefore, following the idea of Mujib & Mardiyah (2025), it would be crucial to understand students' attitudes towards science and technology, establishing as a general objective (OG, as per its Spanish acronym) to explore and describe the beliefs and perceptions that 6th-year students have about the subject of Knowledge of the Natural, Social and Cultural Environment in relation to the Language Communication Competence, the textbook and compare them with other resources such as technological ones.in the subject of Knowledge of the Natural, Social and Cultural Environment in relation to linguistic communication skills and the textbook, and to compare them with other resources such as technological resources.

A series of specific objectives (OE, as per its Spanish acronym) are broken down from this OG in order to contribute to its achievement:

- OE1: Examine the link between textbooks as a resource in the development of students' linguistic communication skills.
- OE2: Explore the influence of technological and multimodal resources on students' motivation and understanding of the subject Knowledge of the Natural, Social and Cultural Environment.
- OE3: Analyse significant differences in students' perceptions of technological resources according to gender and educational establishment.

2. Methodology

The method used in this research is quantitative, non-experimental, descriptive and correlational, as it aims to explore and describe the beliefs and perceptions of sixth-year primary school students regarding the subject of Natural, Social and Cultural Awareness (CMN, as per its Spanish acronym) in relation to communication skills, textbooks and technological resources.

This design allows for data to be collected about phenomena that occur in a natural context, i.e. without manipulating variables. This allows possible links between variables to be identified without inferring causal relationships. Therefore, the correlational nature of the research facilitates the analysis of relationships between variables such as the type of resource used and the perception of skills development, while the descriptive component aims to represent students' perceptions of the resources and their experiences in the subject.

2.1. Sample

The research has been designed for sixth-year primary school pupils from different schools in the province of Cádiz. A non-probability convenience sample was used based on accessibility to the field. A total of 170 students participated (Table 1), distributed across six public educational establishments. To maintain anonymity, their names will not be disclosed.

Table 1

Distribution of the sample by school and gender

School	n	Type of schools	Gender		
			Boy	Girl	Others
School 1	71	City	52.11%	47.89%	0%
School 2	12	City	58.33%	41.67%	0%
School 3	25	City	60%	40%	0%
School 4	26	City	38.46%	61.54%	0%
School 5	11	City	45.45%	54.55%	0%
School 6	25	City	24%	76%	0%

2.2. Research questions

The research questions that guide this study are presented below. They facilitate the analysis of the dimensions under study and contribute to the achievement of the objectives set:

- Do linguistic communication skills, textbooks and technological resources influence student motivation in CMN?
- Are there significant differences between these four dimensions and the gender variable?
- Are there significant differences between these four dimensions and the school variable?

2.3. Assumption

Based on the following research questions, a series of assumptions are proposed:

A_1: There are significant differences in the four dimensions (perception of the CMN subject, communicative competence in the CMN subject, the textbook as an educational resource, and resources to motivate learning) according to gender.

A_2: There are significant differences in the four dimensions (perception of the CMN subject, communicative competence in the CMN subject, the textbook as an educational resource, and resources to motivate learning) according to school.

A_3: Linguistic communication competence, use of textbooks and technological resources significantly influence student motivation towards the subject of Knowledge of the Natural, Social and Cultural Environment (CMN).

2.4. Instrument

The research used a Likert scale questionnaire ranging from 1 to 10 divided into four dimensions (Table 2):

Table 2

Questionnaire distributed by blocks and items

Block	Items
Perception of the CMN subject	1.What I learn in class I can use in my daily life. 2.This subject makes me curious to learn more. 3.This subject helps me understand how our actions affect the environment. 4.In this subject, I learn actions to be more environmentally responsible. 5.This subject helps me understand how society is organised. 6. This subject helps me learn about our rights and responsibilities as citizens.

Block	Items
	7. This subject helps me appreciate the cultural and heritage wealth of my city and Andalusia.
Communicative competence in the CMN subject	9. This subject teaches me how to write texts to express my opinion and knowledge. 10. In this subject, I read various types of texts about nature, society, and culture. 11.This subject helps me understand and interpret texts. 12. This subject allows me to share my ideas about what we have learned in class orally. 13. This subject allows me to share my ideas about what we have learned in class orally. 14.This subject helps me organise my ideas and knowledge so that I can communicate them clearly. 15. This subject teaches me to use communication to express my emotions and manage my thoughts. 16. Through the activities in this subject, I am learning to respect my classmates' emotions and opinions when communicating with them.
The textbook as an educational resource	17. The social studies textbook has texts that help me understand the topics. 18. The social studies textbook has pictures that help me understand difficult ideas. 19.With the social studies textbook, I learn new words. 20. The social studies textbook has activities for sharing ideas with the class. 21. The social studies textbook provides me with other resources (videos, books, etc.). 22.The texts in the social studies textbook make me curious.
Resources to motivate learning	23. Making videos would help me understand this subject better. 24. Making presentations (PowerPoint, Canva, etc.) would help me to understand the subject better. 25. Using tablets and computers would help me understand this subject better. 26. The use of picture books would help me to understand the subject better. 27. Making videos would help me understand this topic better. 28. Using pictures would help me to understand the subject better. 29.Using videos would help me understand this subject better. 30. Using social media (Instagram, X, etc.) would help me better understand this subject.

The validation of the instrument was based on 53 items distributed across four blocks (Table 2). Next, content validity was assessed by experts, according to Lawshe, with five expert judges who were not only from the university sector but also active teachers. After analysis, five items with scores lower than 0.8 were eliminated first, and after qualitative comments from the experts, another 18 items were discarded. Finally, Cronbach's alpha was applied, obtaining a value of .884.

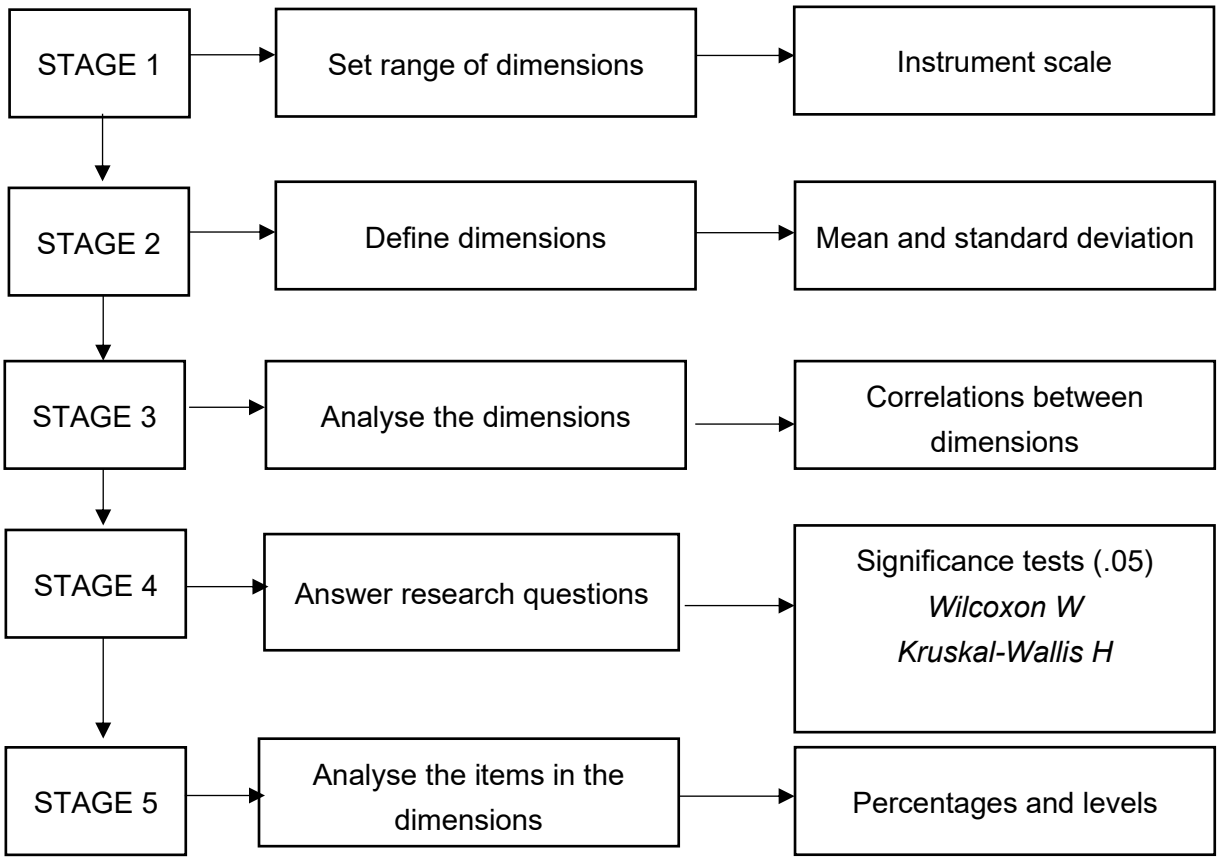
Nine judges from different universities (Málaga, Valladolid, Seville, Valencia, and Cádiz) participated in this process, all of whom had profiles related to different dimensions of the instrument.

2.4. Procedure

The phases of the investigation correspond to those determined by Heredia et al. (2024) (Figure 1):

Figure 1

Stages of research



Adapted from Heredia-Ponce et al. (2024)

After these four phases, trends were analysed in relation to the items raised using SPSS statistical software (v.29.00.00).

3. Results

For the overall analysis, a scale was established based on the scores obtained in each of the dimensions. This assessment was divided into four levels that would be used to make the different comparisons (Table 3):

Table 3

Scale with scores by dimension

Dimensions	Minimum	Maximum	Range	Scale			
				Totally disagree	Disagree	Agree	Totally disagree
D1	0	80	80	[0-20]	[21-40]	[41-60]	[61-80]
D2	0	80	80	[0-20]	[21-40]	[41-60]	[61-80]
D3	0	60	60	[0-15]	[16-30]	[31-45]	[46-60]
D4	0	80	80	[0-20]	[21-40]	[41-60]	[61-80]

First, the distribution of dimensions within the established levels as a whole was analysed (Table 4). It was noted that dimension 1 obtained the highest percentage, ranking at the 'Totally agree' level. In contrast, the others responded 'Agree', although it should be noted that, in dimension 2, 11.2% responded 'Disagree'.

Table 4

Percentage for each dimension

Dimensions	Totally disagree	Disagree	Agree	Totally agree
D1	1.2%	7.1%	31.8%	60%
D2	1.2%	11.2%	38.8%	48.8%
D3	1.8%	8.8%	41.2%	48.2%
D4	0%	5.9%	43.5%	50.6%

Regarding the average dimensions (Table 5), all dimensions would be at the 'Agree' level, although the highest score was given to dimension 1, compared to the three dimensions with the lowest average scores.

Table 5

Dimensions' mean

Dimensions	n	m ± sd
D1	170	60.43 **± *11.908***
D2	170	56.59 **± *13.149***
D3	170	43.49 **± *9.781***
D4	170	58.88 **± *11.009***

After analysing the mean dimensions, the presence of correlations between each of them was analysed.

Table 6

Correlations between dimensions

Dimensions	1	2	3	4
1				
2	.571**			
3	.643**	.619**		
4	.123	.151*	.268**	

The table shows that there were correlations between them, except between dimensions 4 and 1. It should be noted that the relationship between dimensions 2-3, 3-1 and 4-3 is significant at 99%** ($p<.01$) and between dimensions 4-2 it is significant at 95%* ($p<.05$). Furthermore, there is a higher correlation between 3 and 1, i.e. between the CMN subject and the textbook, with a striking lack of correlation with resources to motivate learning.

Once the correlations have been explained, we proceed to analyse the significance between the different variables calculated, which would be the dimensions, and the predictors gender and educational establishments.

With regard to gender (Table 7), there are no significant differences, although it can be seen that the average for girls is higher in all dimensions except dimension 4, although the difference is minimal. It is true that the average is higher in dimension 3 in both sexes compared to the other dimensions.

Table 7

Link between dimensions and sex

Dimensions	Gender	Average range	m ± sd	Wilcoxon W	p
D1	Boy	81.04	3.53± .693	7572.00	.658
	Girl	84.13	3.49± .674		
D2	Boy	83.64	3.34± .693	6691.500	.609
	Girl	87.15	3.37± .756		
D3	Boy	84.40	3.44± .592	6752.000	.757
	Girl	86.48	3.46± .621		
D4	Boy	86.19	3.38± .700	7640.00	.849
	Girl	84.89	3.34± 1.737		

With regard to the schools (Table 8), there are significant differences in all dimensions, as $p<0.05$. It can be observed that in dimensions 1 and 2, the average is higher in school 1, compared to dimensions 3 and 4. It is also noteworthy that in dimension 1 and school 1, the average value of 3.72 reflects that the perception is relatively positive in this dimension and in this school. The 0.484 deviation suggests a moderate dispersion of responses. However, when compared to other schools, this value is the highest, indicating that students at school 1 have a better perception of this dimension. Furthermore, the Krustal-Wallis test shows a value of 23.204 and $p=0.001$, indicating that there are differences between schools.

As for dimension 2, it can be noted that schools 1 has an average score of 3.63, which again indicates a relatively positive perception, although lower than in dimension 1. In this regard, once again, the perception of this dimension in school 1 is higher compared to the rest. Continuing with dimension 3, the value 3.56 in school 3 is close to the values in schools 1 and 2, thus reflecting that perceptions are similar in these schools. Finally, with regard to dimension 4, school 3 has a more positive perception compared to the others, with a value of 3.76. The 0.523 deviation reflects some variability in student responses, although it is within a reasonable range.

In short, the highest values are found in school 1 in dimensions 1 and 2, and in school 3 in dimensions 3 and 4. In this regard, the Kruskal-Wallis test shows differences between schools in all dimensions, suggesting that perception is influenced by the educational context.

Table 8

Link between dimensions and schools

Dimensions	Schools	Average range	*m ± sd*	*Kruskal-Wallis H*	*p*
1	School 1	98.16	3.72± .484	23.204	.001*
	School 2	96.67	3.58± .900		
	School 3	78.10	3.40± .707		
	School 4	90.96	3.58± .703		
	School 5	57.86	3.00± .894		
	School 6	58.06	3.12± .666		
2	School 1	102.62	3.63± .541	25.220	.001*
	School 2	97.08	3.50± .798		
	School 3	80.90	3.32± .627		
	School 4	72.54	3.08± .935		
	School 5	55.50	2.82± .874		
	School 6	62.60	3.04± .611		
3	School 1	94.05	3.52± .557	28.583	.001*
	School 2	99.88	3.50± .905		
	School 3	96.06	3.56± .507		
	School 4	93.38	3.42± .857		
	School 5	59.59	3.00± 632		
	School 6	46.96	3.36± .718		
4	School 1	88.60	3.51± .531	17.717	.003*
	School 2	90.67	3.50± .674		
	School 3	109.82	3.76± .523		
	School 4	78.12	3.35± .639		
	School 5	80.05	3.36± 674		
	School 6	59.98	3.08± .640		

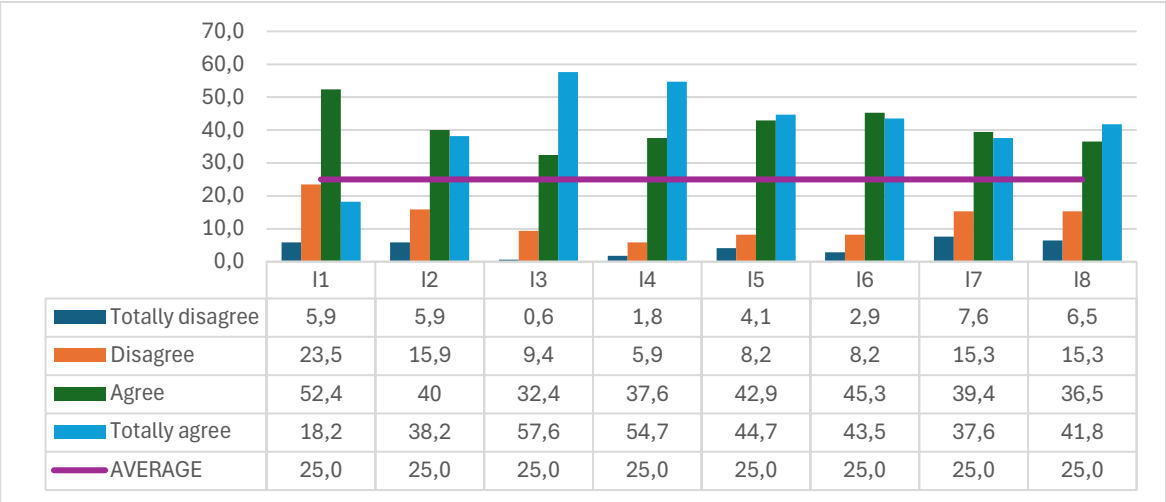
After analysing the overall data, it is interesting to analyse some of the items in each dimension. To do this, a scale is established with values from 0 to 10:

[0-2] – Totally disagree
[3-5] – Disagree
[6- 8]- Agree
[9-10]- Totally agree

With regard to the items in the first dimension (Figure 2), all students agree with each of them, but it should be noted that 23.5% disagree with the statement ‘What I learn in this subject can be used in my daily life.’

Figure 2

Percentage of items in the first dimension



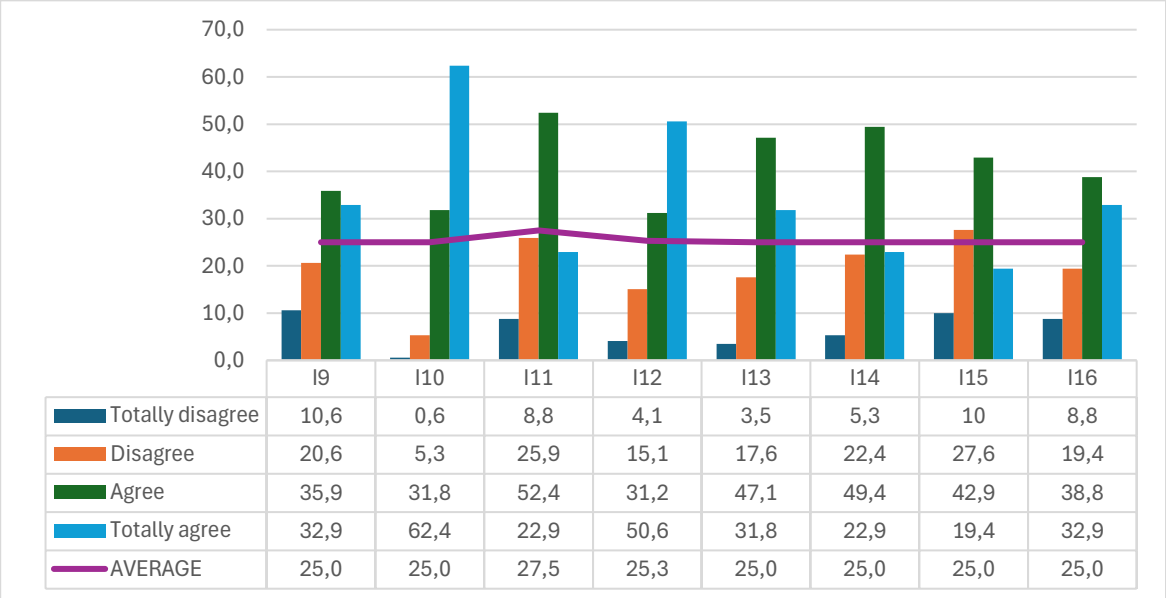
	I1	I2	I3	I4	I5	I6	I7	I8
Totally disagree	5,9	5,9	0,6	1,8	4,1	2,9	7,6	6,5
Disagree	23,5	15,9	9,4	5,9	8,2	8,2	15,3	15,3
Agree	52,4	40	32,4	37,6	42,9	45,3	39,4	36,5
Totally agree	18,2	38,2	57,6	54,7	44,7	43,5	37,6	41,8
AVERAGE	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0

Source: Own elaboration.

Regarding items related to the CCL (Figure 3), most responses were 'Agree' and 'Totally agree,' which shows that the perception of the subject is generally positive. Similarly, the highest-rated items are 10, 11, 12 and 13, with item 10 standing out: 'In this subject, I read different types of texts about nature, society and culture.' On the other hand, item 15, 'The subject teaches me to use communication to express my emotions and manage my thoughts,' has a high percentage of 'Disagree' responses (27.6%).

Figure 3

Percentage of items in the second dimension



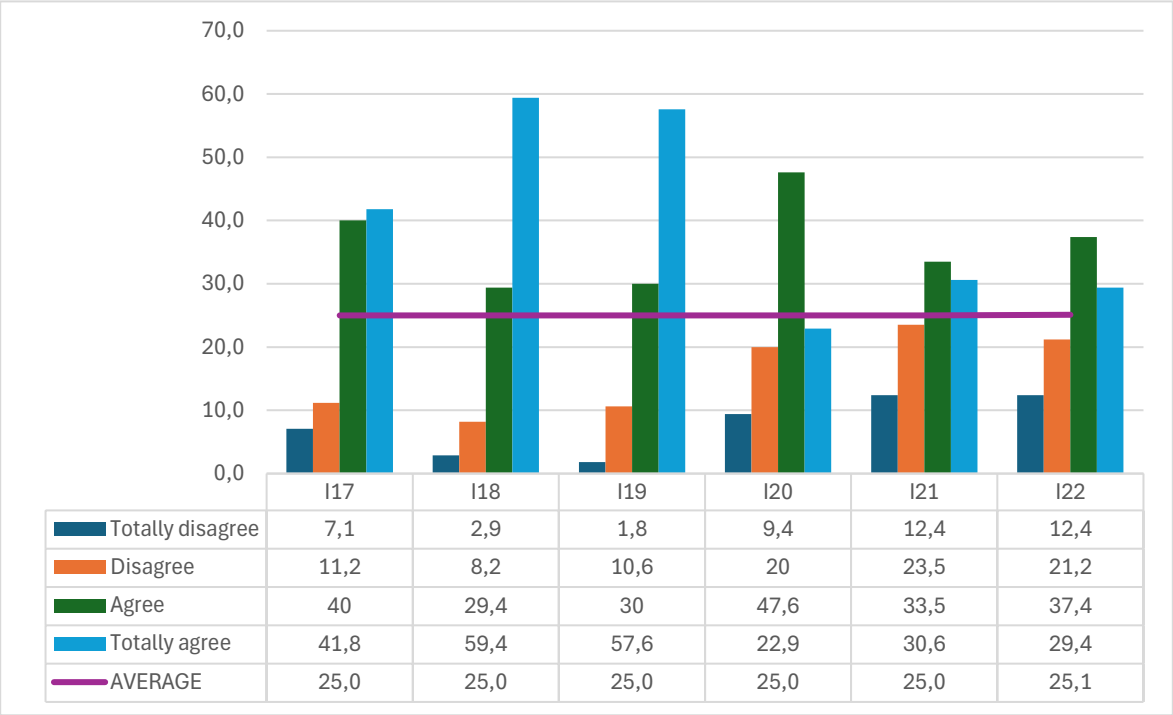
	I9	I10	I11	I12	I13	I14	I15	I16
Totally disagree	10,6	0,6	8,8	4,1	3,5	5,3	10	8,8
Disagree	20,6	5,3	25,9	15,1	17,6	22,4	27,6	19,4
Agree	35,9	31,8	52,4	31,2	47,1	49,4	42,9	38,8
Totally agree	32,9	62,4	22,9	50,6	31,8	22,9	19,4	32,9
AVERAGE	25,0	25,0	27,5	25,3	25,0	25,0	25,0	25,0

Source: Own elaboration.

As for the size of the textbook (Figure 4), most items received 'Agree' and 'Totally agree' responses, reflecting a learning culture in CMN that is centred on this resource. Item 18, 'The book has pictures that help me understand difficult ideas,' and item 19, 'I learn new words from the book,' stand out, with 59.4% and 57.6%, respectively, who 'totally agree.' In contrast, item 22, 'The texts in the book make me curious,' showed that 21.2% of students 'Disagree' and 12.4% 'Totally disagree.'

Figure 4

Percentage of items in the third dimension



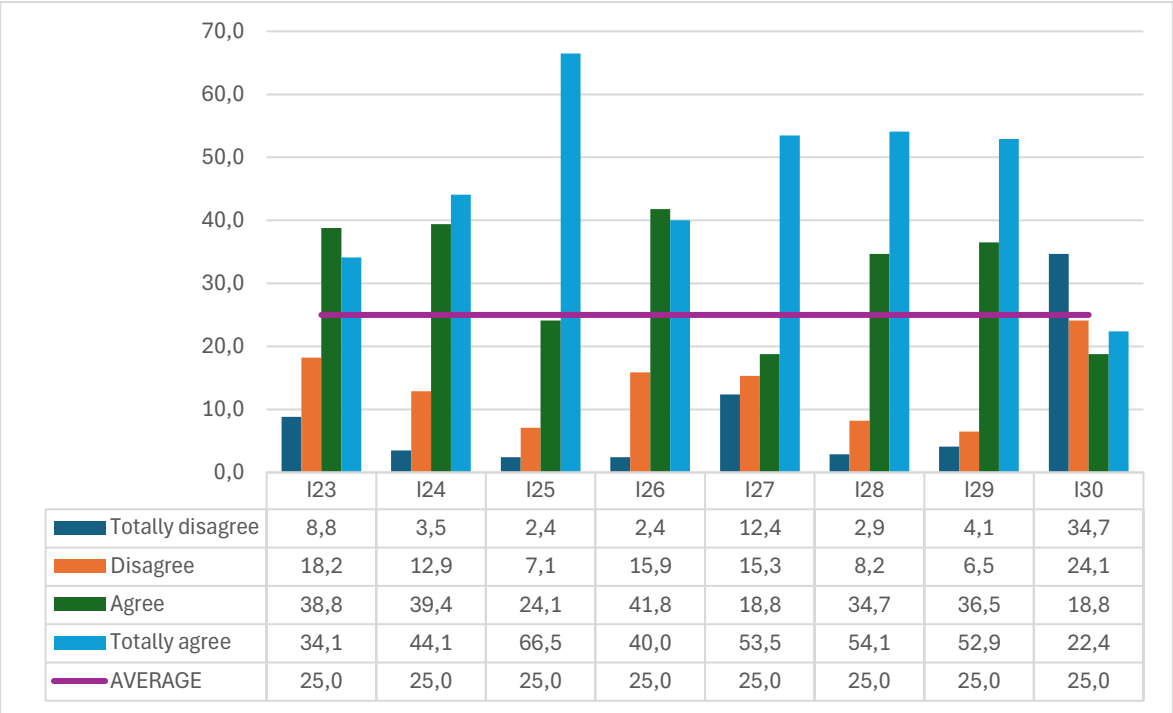
	I17	I18	I19	I20	I21	I22
Totally disagree	7,1	2,9	1,8	9,4	12,4	12,4
Disagree	11,2	8,2	10,6	20	23,5	21,2
Agree	40	29,4	30	47,6	33,5	37,4
Totally agree	41,8	59,4	57,6	22,9	30,6	29,4
AVERAGE	25,0	25,0	25,0	25,0	25,0	25,1

Source: Own elaboration.

Finally, regarding motivational resources (Figure 5), most items received 'Agree' and 'Totally agree' responses, reflecting that students perceive technological resources as motivating. Item 25 stands out: 'Using tablets and computers would help me to understand the subject better', with 66.5% of respondents who 'Totally agree', making it the most highly rated resource. Similarly, items 26 'Picture books' with 40% 'Totally agree' and 41.8% 'Agree', 27 'Video games' with 53.5% 'Totally agree' and 29 "Videos" with 52.9% 'Totally agree' are also perceived very positively. In contrast, item 30, 'Social media to better understand the subject,' received a lower rating, with 34.7% 'Totally disagree' and 24.1% 'Disagree.'

Figure 5

Percentage of items in the fourth dimension



	I23	I24	I25	I26	I27	I28	I29	I30
Totally disagree	8,8	3,5	2,4	2,4	12,4	2,9	4,1	34,7
Disagree	18,2	12,9	7,1	15,9	15,3	8,2	6,5	24,1
Agree	38,8	39,4	24,1	41,8	18,8	34,7	36,5	18,8
Totally agree	34,1	44,1	66,5	40,0	53,5	54,1	52,9	22,4
AVERAGE	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0

Source: Own elaboration.

4. Conclusions

This research has provided detailed insights into how sixth-year primary school students perceive the CMN subject, and how it relates to CCL. Furthermore, this study has provided insight into students' opinions on the usefulness of textbooks in learning CMN and how they perceive alternative resources for the CMN teaching and learning process. In this regard, the results of the research reflect that most students perceive the subject positively, and also highlight that alternative resources such as picture books and technological resources could have a positive influence on learning CMN.

Firstly, the results reflect that students perceive that the CMN subject is related to CCL (comprehension and expression of ideas through oral communication, writing, etc.). However, emotional competence and thought management were not rated positively, indicating that these should be areas for improvement in the planning of the subject.

Secondly, the research shows that most students perceive textbooks as a useful resource that contributes to their understanding of CMN content. This differs from the research conducted by Romero-Fernández et al. (2020); and Riveros (2020), who highlight that textbooks are one of the main reasons for lack of interest in science, as they promote a traditional pedagogical approach with their individual and rote learning format. However, we chose to incorporate alternatives that spark the reader's curiosity (Tabernero, 2022) and critical thinking through the multimodal approach offered by informational books, also known as non-fiction picture books, to develop these types of subjects based on the extrinsic and intrinsic motivation of reading (Young et al., 2007).

However, technological resources such as computers, video games and videos have been rated extremely positively in terms of the motivation they provide and the facilities they offer in understanding CMN content. However, as stated by Romero-Oliva et al. (2020), we approach of 'techno-educators' ideas from the perspective of learning ecology: for them, learning about technology occurs primarily outside of school (in informal or non-formal, virtual and analogue environments) and is brought into the school; thus, the school takes advantage of 'external' learning and, in turn, shows a significant deficit in meaningful learning in relation to technology. In our case, media training should be chosen for inclusion in CMN learning processes.

Thirdly, the results do not show any significant differences between the dimensions analysed and the gender variable, meaning that perceptions do not vary according to gender. However, girls tend to rate most dimensions slightly higher, but these differences are not significant. Therefore, these results show that perceptions of the CMN subject, the textbook, alternative resources, and CCL are homogeneous among boys and girls.

Fourthly, significant differences were found between the six schools studied in all the dimensions under analysis. This may indicate that the school context has an impact on students' perceptions, so it is essential to consider whether this is due to the teaching approaches used, the resources available, etc., in order to take into account all these characteristics that will help plan interventions to improve the quality of CMN teaching, which is a fundamental prospect for this thesis: The contribution of non-fiction picture books to the learning of non-linguistic subjects. *A design study focused on media and information literacy*, to which this study is linked.

As for the purposes of the study, in addition to the aforementioned classroom intervention, teacher training, analysis of the causes of differences between schools, and expansion to other educational levels beyond 6th year of primary education should be added. In relation to this, and based on the findings obtained, the design and implementation of an interdisciplinary teaching intervention for the CMN subject is proposed, integrating illustrated non-fiction books and technological resources such as tutorials, interactive videos, and educational games that simulate scientific aspects. This educational and interdisciplinary intervention would be aimed at developing linguistic communication skills and media and information literacy, with the aim of contributing to the formation of critical readers who understand the scientific content of CMN in a rational and critical manner, thereby promoting interest and motivation in the subject. Likewise, it is essential to train teachers in the pedagogical use of non-fiction picture books in order to select (Garralón, 2013 & Ruth-Gill, 2009) and revitalise (Montenegro and Silva, 2019) this resource correctly, as well as technological resources from a pedagogical point of view, without neglecting the adaptation of the intervention to the contextual characteristics of the educational centre. Therefore, the results and conclusions of this research allow us to design an intervention that promotes more motivating and meaningful teaching of CMN through analogue resources such as illustrated non-fiction books, but also using technological resources.

On the other hand, the limitations would be the limited sample of 170 students, which means that the results cannot be extrapolated to other areas or educational contexts. Furthermore, the quantitative approach using a Likert scale questionnaire does not explore some aspects in depth.

In short, analysing the results obtained and identifying areas for improvement helps to build a foundation for intervention in educational centres with the aim of improving the quality of CMN teaching. This means that, thanks to the positive and negative aspects identified,

the main objective of this study can be achieved: the design and implementation of an intervention for the CMN subject. This should integrate resources such as illustrated books and technological resources in order to increase student motivation and contribute to CCL, as it is a prerequisite for access to any discipline of knowledge.

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Conceptualization, S.G.M., H.H.P. and M.F.R.O.; Data curation, S.G.M. and H.H.P.; Formal analysis, S.G.M. and H.H.P.; Investigation, S.G.M., H.H.P. and M.F.R.O.; Methodology, H.H.P. and M.F.R.O.; Project administration, S.G.M., H.H.P. and M.F.R.O.; Resources, S.G.M., H.H.P. and M.F.R.O.; Software, H.H.P.; Supervision, H.H.P. and M.F.R.O.; Validation, H.H.P. and M.F.R.O.; Visualization, S.G.M., H.H.P. and M.F.R.O.; Writing – original draft, S.G.M., H.H.P. and M.F.R.O.; Writing – review & editing, S.G.M., H.H.P. and .F.R.O.

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Conflicts of interest
The authors declare that they have no conflict of interest

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