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Identifying opportunities to improve reading comprehension levels: factors and teaching proposals

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Abstract

The study has two articulated objectives: on the one hand, to conduct research on and evaluate the presence in the scientific literature of classroom contextual factors determining reading comprehension and related teaching proposals and, on the other hand, to establish the common aspects of the conclusions reached by the scientific literature in order to detect possible opportunities for improvement in comprehension results. From a mixed methodological approach, this research is developed in two phases: the first consists of an integrative review from which a descriptive statistical study is carried out to relate dichotomous variables with contingency tables to obtain absolute frequencies and the chi-square statistic, and the association between classroom contextual factors and teaching proposals. The second phase consists of a critical examination of scientific texts. The results reveal the need to address all classroom contextual factors systematically and show the coinciding arguments in the conclusions reached in the scientific literature, which offers an opportunity for improvement born of the scientific consensus identified in the literature. We conclude with the need to carry out an exploration that shows to what extent these factors are known and attended to in Spanish classrooms by teachers and to design training and teaching proposals to meet the needs detected.

Keywords: Reading comprehension; classroom environment; teaching methods; academic performance; Primary Education; literature reviews.

Identificación de oportunidades de mejora de los niveles de comprensión lectora: factores y propuestas didácticas

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Resumen

El estudio plantea dos objetivos: por un lado, investigar y evaluar la presencia en la literatura científica de los factores contextuales de aula determinantes en la comprensión lectora y de propuestas didácticas relacionadas y, por el otro, establecer los aspectos comunes de las conclusiones alcanzadas por la literatura científica para detectar posibles oportunidades de mejora en los resultados en comprensión. Desde un enfoque metodológico mixto, esta investigación se desarrolla en dos fases: la primera consiste en una revisión integradora a partir de la que se realiza un estudio estadístico descriptivo para relacionar variables dicotómicas con tablas de contingencia para obtener las frecuencias absolutas y el estadístico chi-cuadrado, y la asociación entre factores contextuales de aula y propuestas didácticas. La segunda fase consiste en un examen crítico de textos científicos. Los resultados revelan la necesidad de atender todos los factores contextuales de aula sistemáticamente y muestran los argumentos coincidentes en las conclusiones alcanzadas en la literatura científica, lo que ofrece una oportunidad de mejora nacida del consenso científico identificado en la literatura. Se concluye con la necesidad de realizar una exploración que evidencie en qué medida son conocidos y atendidos en las aulas españolas por los docentes estos factores y diseñar formaciones y propuestas didácticas para atender las necesidades detectadas.

Palabras clave: Comprensión lectora; ambiente del aula; métodos de enseñanza; rendimiento académico; Educación Primaria; revisión bibliográfica.

INTRODUCTION

One of the main issues currently raised by scholars of reading education is how to define, address and overcome the deficits that students present in relation to reading comprehension (CompL) and their low levels of acquisition, which have once again been highlighted in Spanish institutions through the *Estudio Internacional de Progreso en Comprensión Lector* (International Study of Progress in Reading Comprehension) (Spanish Ministry of Education and Vocational Training, 2023), where Spain on average scores 521, which places it below the average of the countries that make up the Organisation for Economic Co-operation and Development (OECD) and the European Union (EU) (OECD average, 533; EU, 528).

The results obtained show that research efforts in the field of reading should focus on improving the levels achieved by students in the aspects of comprehension worked on in the classroom. It will therefore be necessary to consider what elements or factors intervene in the work context in order to try to improve performance in the field of reading and, more specifically, in the field of comprehension.

Link between CompL, academic performance and executive functions in primary school

In Spain, the legal framework (Royal Decree 157/2022) sets forth that - by the end of Primary Education - the acquisition of CompL by pupils should consist of the development of 'reading comprehension strategies before, during and after reading' that allow for the 'identification of the most relevant ideas and interpretation of the overall meaning, making the necessary inferences' and critical evaluations. There should also be the 'identification of graphic and paratextual elements at the service of comprehension', work on shared and expressive reading, as well as 'the detection of clearly discriminatory uses of verbal and non-verbal language' (Royal Decree 157/2022, p. 87).

CompL work in the classroom becomes an activity that focuses on the development of reading strategies in order to achieve, on the part of the students, the identification, analysis, interpretation and evaluation of ideas present in a text, both written and represented, and which must be worked on through social interaction.

Research shows that CompL is an activity directly related to academic performance (Jover-Mira et al., 2020) and that it lays the foundations for the possibilities of success in the acquisition of knowledge and the development of skills that students can achieve in the subjects, establishing correlations between the achievements attained in the subjects and reading skills (Gómez-Chacón et al., 2014). Academic performance is linked to the acquisition of skills involved in CompL, such as reading speed, reading fluency, identifying the main idea of the text, locating specific information in a text and using the information contained in a text to develop an argument (Viramontes-Anaya et al., 2019). The lack of acquisition of these skills is reflected in poor academic performance and, in many cases, in a delay in school progress compared to those who do acquire them.

However, the level of CompL of Primary Education students does not limit its influence to academic results, but extends to the correct performance of tasks that set in motion executive functions of working memory, inhibition and attention, which enhance 'the predictive power of problem solving and flexibility on literal and inferential comprehension processes, as well as planning on text structure' (Rello-Segovia et al., 2018, p. 375). Correctly working on these activities enables the learner to perform the 'essential skill to understand what is written' and to achieve 'educational success' (Cantú et al., 2017, p. 115). Reading and understanding what is read becomes 'an ideal means for the construction of human autonomy' (Agudelo-Palacio, 2019, p. 104), allowing them to know, analyse, reflect and make decisions autonomously.

Contextual factors and teaching proposals for the improvement of CompL in the classroom

Based on the CompL tests, designed by the International Association for the Evaluation of Educational Achievement (IEA) and applied in Spain, whose results are disseminated by the Instituto Nacional de Educación Evaluativa, the PIRLS 2021 Reading Assessment Framework is generated, whose main objective is 'to gather information about the student's family and school context for learning to read' (Spanish Ministry of Education and Vocational Training. Instituto Nacional de Evaluación Educativa, 2023, p. 30). These data, based on data from schools in all the Autonomous Communities, highlight the factors that can directly influence reading work in classroom contexts (Mullis & Martin, 2021), which are as follows:

- Student engagement: motivation or desire to read and achieve (Lustyantie & Kasan, 2021). Highly relevant and highly influenced by the class context. Student characteristics affect reading outcomes (Spencer et al., 2019).

- Implementation of reading strategies: 'organised activities that are carried out on a given piece of information in order to discriminate the relevant information in a text' (Peña, 2000, p. 160). They are key to comprehension outcomes (McNamara et al., 2007) and increase syntactic, syntactic-semantic, and metacognitive reading comprehension skills (Gutiérrez-Fresneda, 2016). The purpose of reading conditions the reading strategy and this relationship influences the comprehension outcome (Aşikcan et al., 2018).

- Types of texts worked on. Comprehension requires the identification of the textual schemes that make up conventional text types (Tapia, 2005; Golder & Gaonach, 2009).

- Classroom organisation. It significantly influences CompL if a learner-centred learning environment is created (Kikas et al., 2018). It includes the grouping of readers (Andreassen & Bråten, 2011; Rydland & Gröver, 2019) and the classroom environment (Cairney, 2018).

- Use of the school library as a resource. It supports achievement when it encourages the acquisition of reading habits, provides a safe and welcoming environment (Wood et al., 2020) and presents engaging reading programmes (Loh et al., 2017).

- Assessment of reading processes. Tailored to individual needs, it promotes better learning outcomes (Magliano et al., 2007).

- Application of ITs. Although it is not determinant (De-la-Peña et al., 2024), it brings concrete benefits in struggling readers (Soto et al., 2019), so its presence should be considered.

- Teaching proposals. Its presence positively impacts (Asencio-Pastor, 2019) on improving motivation (Valdés-Villalobos & Lazzaro-Salazar, 2023), fluency and comprehension skills (Canquiz-Rincón et al., 2021) and evaluation measures (O'Reilly et al., 2014).

- Teachers' training and experience. Essential for improving CompL in Primary Education; primarily in the articulation of collaboration and assessment (Griffin, 2010) and in the use of specific strategies (Sampson et al., 2013).

The results obtained from the PIRLS tests in Spain (Spanish Ministry of Education and Vocational Training, 2023) in relation to these factors show that CompL training requires the work and development of different skills or strategies for their acquisition. These are progressively completed as the learner deals with different types of texts with different functions. The role played by the optimisation of factors, through teaching proposals, is key to the development of CompL work in the classroom context (Montesdeoca-Arteaga et al., 2020). Therefore, research that aims to contribute to the improvement of students' CompL levels must take into account their presence and analysis, in order to reach conclusions that provide significant improvements aimed at the reality of the classroom.

OBJECTIVES AND ASSUMPTIONS

Since the classroom is the main point of teaching, this paper deals with the study of classroom contextual factors. In order to achieve this, the following research objectives are proposed, focused on providing information and knowledge for the work of improving CompL in Spain

O1. To investigate and evaluate the evidence available in the literature on the presence of classroom contextual factors and teaching proposals as determinants of reading comprehension work.

O2. Based on the common aspects of the conclusions reached by the scientific literature, establish arguments reinforced with already verified hypotheses that offer opportunities to improve the results obtained in the PIRLS tests.

They are linked to the following hypotheses:

H1. The scientific literature, seen as a reference in the search for solutions to improve CompL levels in the classroom, is not addressing teaching proposals and fundamental contextual factors.

H2. A case can be made for improving CompL levels in the classroom on the basis of findings from recent scientific literature.

METHOD

The methodological approach of this research is mixed, as it requires inference from the data obtained in both phases of work in order to verify the hypotheses put forward and allows observation of the data from multiple perspectives (Pole, 2009): in a first phase, objective measurements are made of the presence/non-presence of classroom contextual factors in the literature; in a second phase, the conclusions reached in the selected literature are analysed after the review, in order to identify the coinciding arguments.

It aims at analysing the relevance of the issues raised in the hypotheses, which is why coding by categories is used so that these can be quantified and conclusions can be drawn through descriptive statistics. Consequently, in order to be able to apply the chi-square test, it is necessary to group the data in order to construct a frequency table (Moreno-Rebollo & Pascual-Acosta, 2006).

It is based on the framework of reading assessment and the elements of classroom contexts that can directly influence reading work, included and defined in the framework of the PIRLS 2021 context questionnaire (Mullis & Martin, 2021). Based on this classification, the following categories of analysis are established by equivalence, which make up the study variables:

- For 'Student engagement': learning motivation (MA) and student characteristics (CE).

- For 'Development of reading strategies': reading purpose (PL) and reading strategies (EL).

- For 'Types of texts worked on': textual typology (TT).

- For 'Classroom organisation': classroom organisation (OA).

- For 'Using the school library as a resource': school library (BE).

- For 'Assessment of reading processes': classroom assessment (EA).

- For 'Application of ITs': Classroom Information Technology (IT).

- For 'Teaching proposals': teaching proposal (DP) and promotion of learner autonomy (FA).

- For 'Teachers' training and experience': teacher preparation (PD).

For the selection of scientific literature related to reading comprehension in primary school classrooms that can be used as a reference, we are following the methodological line of Guirao-Goris (2015) with respect to integrative reviews and Hart (2018) with respect to the skills and attitudes needed for a literature review:

- Selection of keywords based on objectives and hypotheses; consultation of databases and reading of the resulting articles related to the research topic for the review and selection of search terms and segments in combination with the Boolean marker 'AND'.

1. In Spanish: rendimiento en lectura, pruebas de rendimiento, comprensión lectora; alumnos de primaria, pruebas de lectura, contexto de aula; alumnos de primaria, pruebas de lectura, comprensión lectora; investigación sobre lectura, comprensión lectora, métodos de enseñanza; comprensión lectora, estrategias de lectura, factores de aula.

2. In English: reading achievement, achievement tests, reading comprehension; primary school pupils, reading tests, classroom context; primary school pupils, reading tests, reading comprehension; reading research, reading comprehension, teaching methods; reading comprehension, reading strategies, classroom factors.

- Consultation of databases Dialnet, WOS and academic search engines SCINAPSE and Google Scholar between 2018 and 2023.

1. Inclusion criteria: documents that exceed the criteria for a scientific publication review; focused on the study of reading comprehension of Spanish as a mother tongue speakers at the primary school stage; written in Spanish or English; full-text layout.

2. Exclusion criteria: final degree dissertations (TFG, TFM) and doctoral theses; non-referenceable documents; presence of bias in authorship, place of publication or relationship with entities or companies with which any of the researchers or their academic affiliation is related.

- Selection of studies using inclusion and exclusion criteria. Choice and inclusion with a result of n=66 (table 1 and figure 1).

Reading and locating the occurrence/non-occurrence of the categories of analysis in the selected documents.

Identification of the percentage in which the categories are present and descriptive statistical study to relate dichotomous variables using contingency tables (to obtain absolute frequencies) and the chi-square statistic to see the degree of association between different contextual classroom factors.

Table 1

Distribution of the selection of publications from each database.

Databases	Search results	Pre-included	Included
Dialnet	372	30	18
WOS	84	16	10
SCINAPSE	30	14	10
Google Scholar	1203	46	28
Total	1689	106	66

Figure 1

Flow chart of the review process.
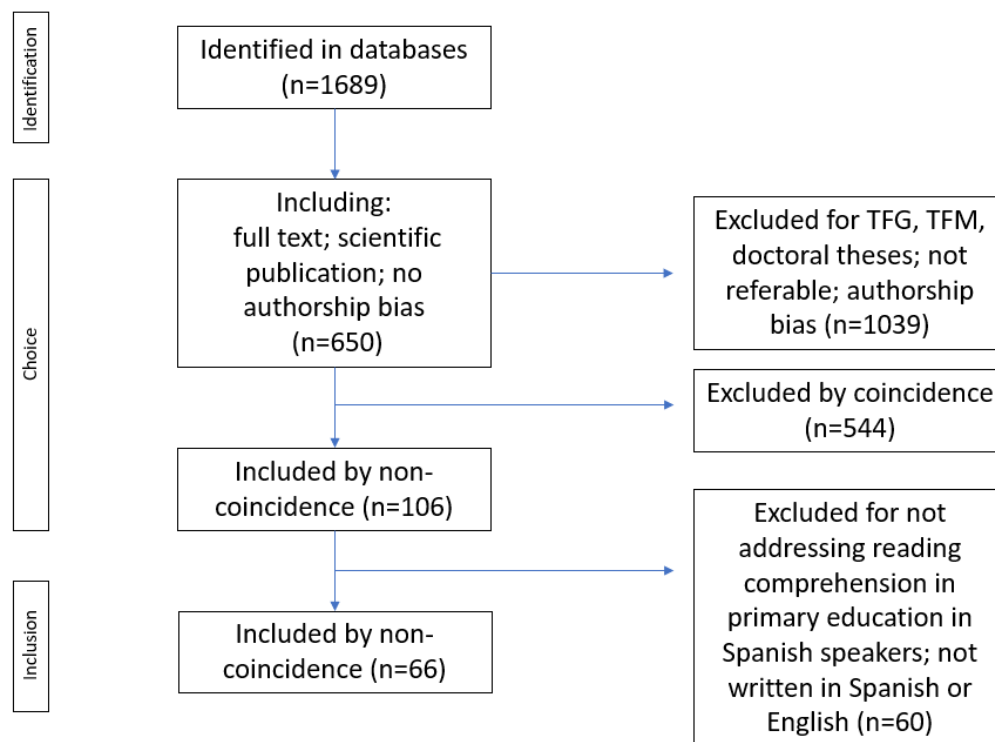
In order to establish the common aspects of the conclusions reached by the scientific literature as 'basic components of a given phenomenon extracted from a given content' (López-Noguero, 2002, p. 168), we start from the descriptive sphere and apply a methodology based on the principles of qualitative research, specifically the critical examination of scientific texts. Based on the conclusions examined, four relevant aspects were identified in the presentation of results:

1. Teaching practice: motivational role and working techniques;

2. Development of metacognitive, cognitive and executive process strategies;

3. Selection of materials and use of ICT;

4. Student confidence in their reading skills.

RESULTS

Presence of key factors in scientific literature to obtain absolute frequencies

The proportion of occurrence of each variable on its own is recorded in all of the selected scientific documents (figure 2).

Figure 2.

Presence of key factors in scientific literature.
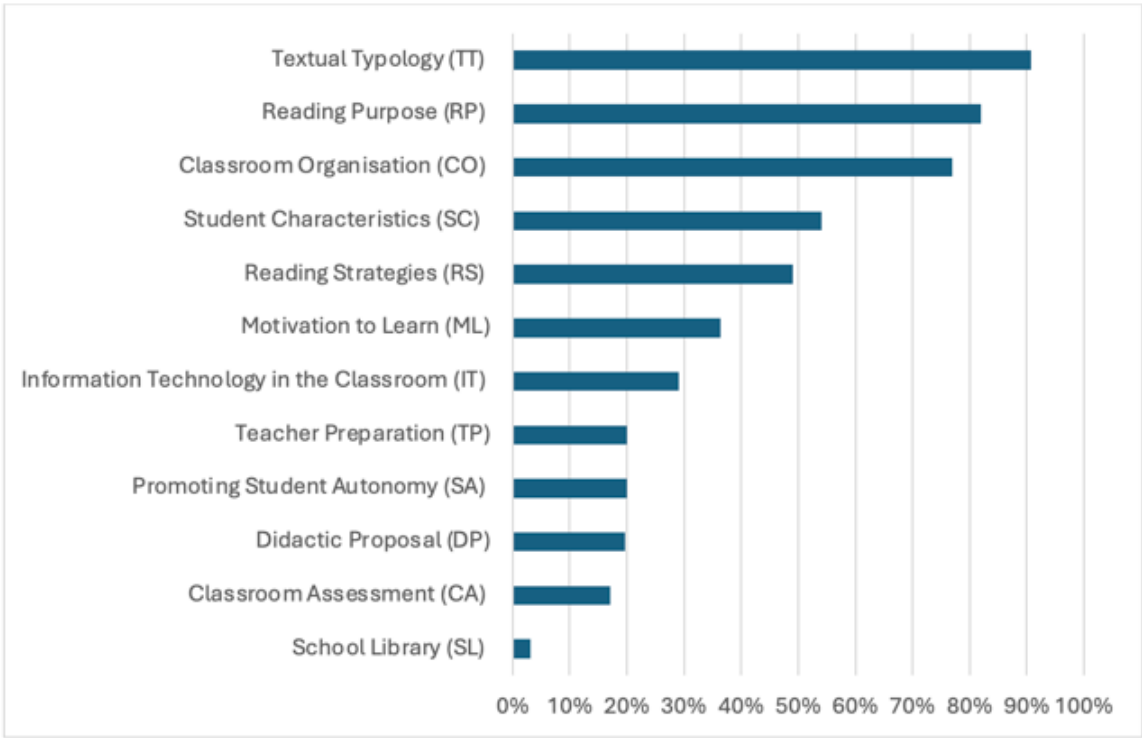
The least common variable is the school library (BE): it only appears in 3.1% of the documents. This is followed by assessment or feedback to the student on their reading work in the classroom (EA): only 17% of research considers this. Furthermore, only a fifth of the studies (19.7%) present any teaching proposals (PD). Twenty percent of the studies address the issue of teacher preparation (PD). Similarly, the implementation of measures to promote student autonomy in learning (FA) is present in 20% of the projects. 29% consider using ICT through some device and/or online reading (IT).

In contrast, 90.8% address the type of reading material used in the classroom, according to medium, communication code or model (TT). A high percentage, 76.9%, also take into account aspects of classroom organisation (OA), such as space management and student organisation; and 82% address either enjoyment or the acquisition and use of information by the reader as a purpose of reading (PL).

An intermediate percentage (54%) addresses characteristics of students related to learning difficulties (CE), while 49% addresses the analysis of cognitive and/or metacognitive reading strategies (EL) and the implementation of measures to motivate and involve students in learning to read (MA), with a 36.4% occurrence.

The percentage of articles that include a teaching proposal (PD) is significantly lower (19.7%) than the percentage that do not (80.3%). Given that 100% of the documents analysed include two or more variables, the studies presenting PD examine the inclusion of each of the other variables that could enrich it. To this end, a specific correlation analysis is performed between this variable and the others, along with a chi-square test to determine the degree of association between the PD variable and the rest, with a significance level of 5%, which yields the following results. Since all p-values are less than 0.05, we assume that all variables are linked to the PD (Table 2).

Table 2

Significance level results of the comparison of the PPD variable with the rest of the variables (Pearson's chi-square test).

VARIABLES	ASYNCHRONOUS SIGNIFICANCE
BAU	<.001
CAE	<.001
PRE	<.001
EVA	<.001
TPM	<.001
PDL	<.001
EST	<.001
MOT	<.001
OAU	<.001
FAU	<.001

After analysis, the results shown in figure 3 are obtained.

Figure 3

Comparison of the presence of other variables in studies presenting a teaching proposal (PPD).
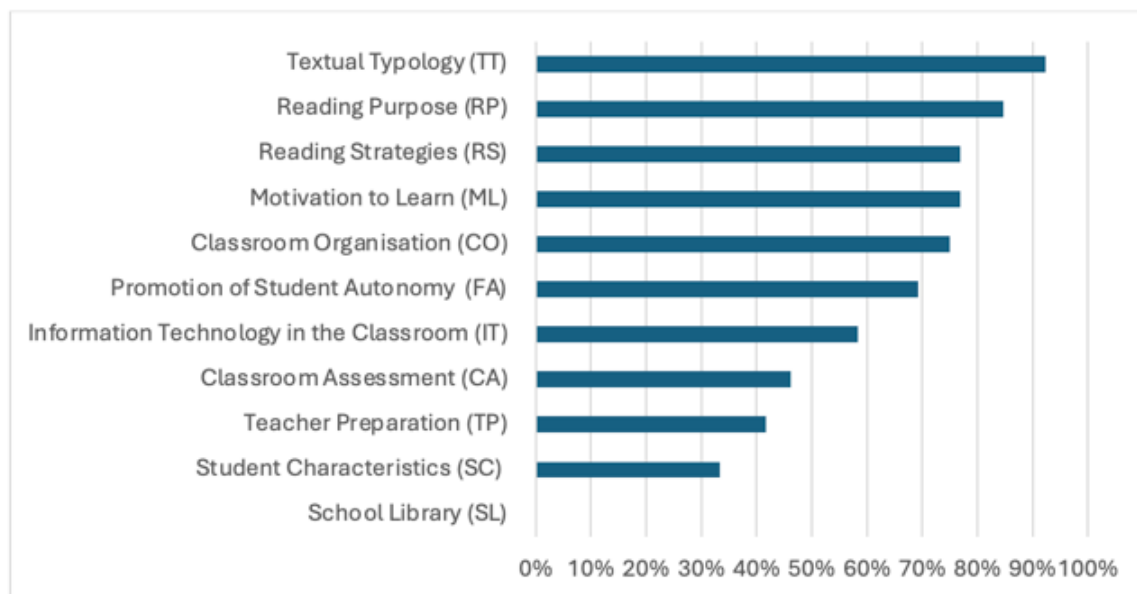
It is noteworthy that no study (0%) mentions the school library (BE). Next, the three variables that are moderately present are student characteristics (CE, 33.3%), teacher preparation (PD, 41.7%) and classroom assessment (EA, 46.2%). This is followed by information technology in the classroom (IT, 58.3%). The rest have a high incidence rate: led by text type (TT, 92.3%), followed by reading purpose (PL, 84.6%); reading strategies (EL, 76.9%); motivation to learn (MA, 76.9%); classroom organisation (OA, 75%) and promotion of student autonomy (FA, 69.2%).

Common aspects of the conclusions reached by the scientific literature

The common aspects related to improving the performance of students with CompL in the classroom that have been identified in the conclusions of the selected scientific literature, presented as hypotheses that are verified through the results, are as follows:

- Teaching practice: motivational role and working techniques: Teaching practice is central to the organisation of the CompL's work in the classroom, both in its motivational role and in the selection and implementation of methodological techniques that promote students' awareness of the identification and understanding of meanings (Lizarazú-Bernal, 2018; Neva, 2021; Ochoa et al., 2019). The correct methodological selection of working techniques by teachers is shown to be a determining factor in the development and acquisition of CompL skills, both in students with diagnosed learning difficulties and in students without such difficulties (Durán et al., 2018; García-Crespo et al., 2019; ; Saltos-Triviño, 2021; Sánchez-Castro & Pascual-Sevillano, 2022).

- Development of executive, metacognitive and cognitive process strategies. Teacher support is considered key to helping students develop different strategies that enable them to understand different types of texts independently and identify, select and analyse information, as well as construct new knowledge as a result of the interaction between the reader and the text (Robledo-Ramón et al., 2019). In

order for these practices to be possible, the value of metacognitive and cognitive reading comprehension strategies as tools for increasing and consolidating CompL among students is highlighted (Vázquez, 2019; Gutiérrez-Fresneda, 2022). Furthermore, the development of executive functioning and CompL training in students at the end of primary education appear to be closely linked: CompL has been shown to be closely related to working memory, and their performance is similar (De-la-Peña & Ballell, 2019).

Regarding the link between executive functions, student tasks and CompL, Mesía-Vargas et al. (2021) specifically defend the need for classroom training in this executive function of attention to improve CompL.

- Selection of text types and use of ICT. The conclusions of studies on this topic agree that selecting stimulating teaching materials significantly helps to engage students in understanding texts and discovering new knowledge through them (Ochoa et al., 2019). Míguez-Álvarez et al. (2022) show that, alongside the most frequently used narrative texts, it is necessary to work with more difficult expository texts. Studies have also shown the use of proverbs (Pedrozo-Castillo et al., 2021), cartoons and comics, which depart from linear reading and promote the acquisition of inferential and critical skills (Lizarazú-Bernal, 2018).

In addition to selecting texts as part of the creation of stimulating teaching materials for reading, the digital format promotes interest in reading, facilitates reading comprehension and encourages collaborative learning (Neva, 2021). Therefore, ICTs are presented as a motivating factor for reading (Bernier-Yanes, 2019; Leandro & Yaya, 2019; Sánchez-Castro & Pascual-Sevillano, 2022), as a methodological strategy that predicts success due to its motivational capacity (Durán et al., 2018) and as a tool for improving critical comprehension among students who show an initial lack of interest in reading, difficulties in reading comprehension processes and poor verbal fluency (Pulgar-Calvo et al., 2018).

- Student confidence in their reading skills. In relation to CompL, the conclusions analysed establish that resilience is conditioned in students by their self-confidence in their reading abilities (García-Crespo et al., 2019). The direct relationship between self-concept and motivation to read is established by Orellana et al. (2020), which link it to significant development in reading comprehension skills. In self-perception and reading development, the educational level of the family or legal guardians is identified as a determining factor (Cubilla-Bonnetier et al., 2021), who act as cultural mediators (González-Araya & Cárdenas-Leitón, 2020).

DISCUSSION AND CONCLUSIONS

This research provides an update on the attention given in the scientific literature to the different contextual factors in the classroom that influence CompL work, as defined by Mullis & Martin (2021). As new content, it identifies the common points established in the specialised literature regarding classroom needs for improving CompL work. This way, it offers opportunities for improvement in this field.

The analysis carried out on the presence of contextual factors in the classroom has highlighted the differences that exist in the attention paid to some students compared to others, which is sometimes practically non-existent.

It has been observed that textual typology, reading purpose and classroom organisation are widely present, which highlights aspects directly related to formal elements of task planning in the classroom for the development of CompL. Focusing on these factors, which are certainly relevant, but ignoring others such as the classroom library, the promotion of student autonomy, teacher training and classroom assessment, is a determining factor in achieving improved results in CompL acquisition processes.

In order to improve the work of the CompL, it is necessary, first, to plan teaching proposals that address each of the factors and, second, to make them available to classrooms, especially after confirming that the presence of teaching proposals in the scientific literature analysed is very low. Furthermore, the

localised proposals also show shortcomings in addressing some of these factors, mainly school libraries, student characteristics, teacher training and assessment.

Although this study has some limitations, such as the lack of publications in languages other than Spanish and English, and the continuous emergence of new publications, it does identify the need for the design and publication of teaching proposals to consider the relevance of all contextual factors in the classroom and to provide teachers with materials and options for intervention that optimise comprehension work. These proposals should position the school library as a key tool for promoting reading habits, access to different reading media and metacognitive learning (Parisi-Moreno et al., 2020); they should propose continuous and formative assessment of students' progress in comprehension, in order to promote student autonomy and the evaluation of processes by teachers. In turn, the foregoing should articulate the different factors that will positively influence reading comprehension work in the classroom, promoting strategies that encourage participation, self-regulation, and the development of students' metacognitive aspects (Blasco-Serrano et al., 2023). Furthermore, the proposals designed must consider account the characteristics of students with learning difficulties, given their relevance for classroom decision-making on how to approach comprehension work based on the neurocognitive and socio-emotional variables involved in the teaching-learning process (Martínez-Álvarez et al., 2020).

As for the results obtained from the critical review of the conclusions reached in the scientific literature selected to establish common aspects, the importance of teaching practice in CompL work can be inferred, both in the selection of working techniques that promote the development of metacognitive, cognitive and executive process strategies, and in the motivational role: strategies influence the progress of the reading and writing process and learning in general, and their assessment in primary school pupils is essential for the initial diagnosis of CompL and the evaluation of results (Carrillo-López et al., 2020). Furthermore, the acquisition of these strategies by students also has an impact on the confidence they gain in their own reading ability (Guzmán-Grados, 2021), which directly influences their level of motivation towards comprehension work and predicts their success in these tasks (Izquierdo-Magaldi et al., 2020).

Furthermore, critical examination highlights the importance of selecting materials and utilising ICT as tools for teaching practice in CompL. Selecting teaching materials that spark a desire to learn and stimulate students' curiosity, accompanied by a format that appeals to their tastes and interests, benefits the attention devoted to the activity, the detection of more correct answers, and the self-regulation of reading speed (Montalvo-Castro & Martos-Castañeda, 2019). At this point, we should become aware of the value of the classroom library and integrate it as a working tool for CompL: a careful selection, based on literary quality and taking into account the preferences of the students, will help them approach the text with greater interest and, therefore, greater motivation.

The combination of these conclusions, reinforced by verified hypotheses (teaching practice: motivational role and working techniques; development of metacognitive, cognitive and executive process strategies; selection of materials and use of ICT; and student confidence in their reading abilities), offers opportunities for work to improve the results obtained in CompL work in the classroom.

Teachers who need to improve CompL levels in their classrooms should analyse whether the acquisition process they implement considers contextual factors. If this is not the case, they should rethink the design of the teaching proposals they will ultimately work on with the students, taking each student into account and drawing on their own training in these fundamental aspects.

Likewise, in relation to theoretical educational implications, it is clear that institutions must address the need to design curricula that take into account the contextual constraints of CompL in the classroom, so that students acquire behaviours, skills and attitudes that favour the results obtained in relation to reading.

Scientific literature needs to pay greater attention to studying the presence of these factors, comparing the results obtained in CompL processes where they are not present with those where they are, observing progress and indicating their level of relevance.

Finally, it is found that the results obtained are relevant and will serve as a basis for further studies, as they demonstrate the need to systematically and consciously address contextual factors in the

classroom. To this end, as a future line of research, there is a need to conduct a study to determine the extent to which these factors are known and addressed by teachers in Spain and, once the results have been obtained, to design training courses and teaching proposals aimed at meeting the needs identified. The lack of a validated data collection tool is a limitation for this future line of research and highlights the need to design one.

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AUTHORS' CONTRIBUTIONS

Inmaculada Mena-Bernal: Project management; Formal analysis; Conceptualisation; Data curation; Writing – original draft; Writing – review and editing; Research; Methodology; Resources; Software; Supervision; Validation.

Beatriz Hoster: Project management; Formal analysis; Conceptualisation; Data curation; Writing – original draft; Writing – review and editing; Research; Methodology; Resources; Software; Supervision; Validation.

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