

# Interventions to improve reading competence: a systematic review

## Intervenciones realizadas para mejorar la competencia lectora: una revisión sistemática

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### **Abstract**

Numerous studies have evaluated intervention programmes for the development of reading competence in primary education (PE). This paper aims to carry out a rigorous systematic review to analyse the complex spectrum of interventions to improve reading competence in PE students. This systematic review has been conducted following the PRISMA statement (Page et al., 2021). Inclusion criteria for the selection of interventions were the following: (1) interventions that were curricular in nature, (2) interventions that improved reading competence and (3) interventions in primary school settings. The article selection process was carried out in 4 stages, and a total of 31 articles were identified and analysed using Atlas.ti (version 9.02). The main results include the descriptive indicators of the articles reviewed and others related to the content of the studies. The following characteristics were identified regarding the interventions: (1) they were remedial,

(2) they targeted students in disadvantaged situations, and (3) they focused on the executive functions. The analysis therefore found and classified educational trends in the development of reading competence. The results obtained benefit the educational community and may serve to guide future teaching actions, as they pointed out those elements referring to specific reading competences and skills, types of activities and didactic resources. In conclusion, the study invites the educational community to strengthen the weaker aspects associated with the more traditional trends in the teaching of reading and to continue to persevere with the more innovative aspects. This research did not receive any external funding.

*Keywords:* Reading, Reading Comprehension, Educational Intervention, Teaching Programmes, Basic Education.

### **Resumen**

Actualmente, existen numerosos estudios en los que se implementan y evalúan programas de intervención para el desarrollo la competencia lectora en educación primaria (EP). En este contexto, este trabajo tiene como objetivo realizar una rigurosa revisión sistemática para analizar el complejo espectro de las intervenciones realizadas para mejorar la competencia lectora en el alumnado de EP. Específicamente, esta revisión sistemática se ha realizado siguiendo la declaración PRISMA (Page et al., 2021). Los criterios de inclusión recogen intervenciones: (1) curriculares, (2) que mejoran la competencia lectora y (3) sobre estudiantes de EP. El proceso de selección de los artículos se desarrolló en 4 etapas, y se identificaron un total de 31 artículos, analizados con Atlas.ti (versión 9.02). Entre los principales resultados, destacamos indicadores de tipo descriptivo de los artículos revisados, así como también otros relacionados con el contenido de los estudios. Esto nos ha permitido descubrir las siguientes características de las intervenciones analizadas: (1) tienen un carácter remedial, (2) están dirigidas a estudiantes en situaciones desfavorecidas, y (3) se enfocan en el nivel ejecutivo. Así, el análisis realizado ha permitido determinar y clasificar las tendencias educativas en el desarrollo de la competencia lectora. Los resultados obtenidos en este trabajo benefician a la comunidad educativa y, además, permiten orientar la futura acción docente, señalando aquellos elementos referidos a las competencias y habilidades lectoras específicas, tipos de actividades y recursos didácticos. En conclusión, el estudio invita a la comunidad educativa a reforzar los aspectos más débiles asociados a las tendencias más tradicionales de la enseñanza de la lectura y a seguir perseverando los aspectos más innovadores. Esta investigación no recibió ninguna financiación externa.

*Palabras claves:* Lectura, Competencia lectora, Intervención educativa, Programas de Enseñanza, Educación Básica.

## Introduction

One of the concerns in primary education (PE) is how to help students develop reading competence to meet both school and social demands (Jones et al., 2018). Research has shown that school success is based on reading achievement (Brigman et al., 2018). Thus, reading difficulties (RDs) that are not addressed educationally may be a predictor of school failure (Reid, 2016). In turn, this failure is highly correlated with problems in students' personal and social lives (Gholami et al., 2016).

Reading competence is based on several axes: learning to read, reading to learn in any academic environment or in everyday life, and learning to enjoy reading (Solé, 2004). Wells (1986) and Freebody and Luke (1990) proposed that this competence can be achieved at four levels. The first is the executive level, which involves knowing and using the written code. The second is the functional level, which entails meeting the challenges of everyday life. The third is the instrumental level, which makes it possible to search for information and have access to knowledge. Finally, the fourth is the epistemic level, which involves thinking and contrasting knowledge in order to use it creatively.

RDs are a recurrent issue in PE classrooms (Bowyer-Crane et al., 2008). RDs can be defined as those barriers that affect the development of skills which contribute to reading comprehension (Cain, 2010). Specifically, RDs emerge when precursor skills such as decoding, or language comprehension are poorly developed (Camarillo, Silva and Romero, 2021). Some research has shown that these difficulties can be prevented through planned interventions (Gholami et al., 2016). Therefore, systematic and quality interventions are needed to help foster the development of reading competence, as well as to reduce the difficulties that students may have in learning to read (Levin & Baratz, 2019).

In recent decades there has been an increase in the number of studies that have investigated what type of intervention should be carried out to improve the reading competence of children in PE (Hernández-Valle & Jiménez, 2001). The preference of one method over another is very important because, according to some research, the type of instruction used to read in initial learning influences the strategies that learners use in word recognition and reading (Connelly et al., 2009).

There is also a bidirectional relationship between the development of phonological awareness (PA) and reading (Novianti et al., 2019). Several studies have shown how interventions that include metalinguistic skills training improve reading readiness (Ball & Blachman, 1991).

There are numerous studies that have evaluated or described intervention programmes to develop reading competence in PE (Akyol & Boyaci-Altinay, 2019; Dowrick et al., 2006). However, there are no systematic reviews that have analysed and brought together all the interventions and programmes that have been implemented to date to improve reading competence in PE. Nor is there a framework to help educators classify them according to the profile, metalinguistic ability, or level of reading competence being developed.

This systematic review starts from the premise that there is no single strategy to meet the different learning styles and needs in reading. In addition, there is a need to provide interventions, criteria and tools to help teachers make the learning pathway engaging, along with various reading resources and strategies (Ghanaat et al., 2017; Hwang et al., 2019; Müller et al., 2015).

The objective of this paper is to carry out a rigorous systematic review and analyse the complex spectrum of interventions available to improve reading competence in PE students.

## **Methodology**

This systematic review was conducted in accordance with the PRISMA statement (PRISMA 2020, Preferred Reporting Items for Systematic Reviews and Meta-Analyses) (Page et al. 2021). The formulation of the research question, the search strategy, and the inclusion and exclusion criteria followed the PRISMA statement (Page et al., 2021). In addition, the study by Lockwood et al. (2015) was used as a basis for drawing together and interpreting the findings of the included studies. The transparency, validity and replicability of the study was ensured by using the list of 11 generic criteria to assess quality included in the appraisal checklist for systematic reviews developed by the Johanna Briggs' Institute (2017).

## **Research question**

The PICO strategy established by the National Institute for Health and Care Excellence (Schardt et al., 2007) was followed in order to establish the research question that guided this systematic review. The acronym PICO

consists of the terms population (P); intervention (I); comparison, control or comparator (C); and outcome (O). Accordingly, the research question posed is as follows: What interventions (Is) have been implemented to improve the reading competence (O) of PE students (P)?

## Search strategy

The search for studies was carried out in March 2021 using the Scopus, ERIC, and Web of Science (WoS) core collection databases. Only journal articles published between 1996 and 2021 were searched, and book chapters, reports or conference proceedings were not included. Studies were identified through a systematic search of keywords designed using the PICO strategy (Table 1).

TABLE I. Keywords formulated using the PICO strategy

	[1] Population	[2] Intervention	[3] Outcomes
Keywords	“primary school*” OR “primary grad*” OR “primary education*” OR “elementary school” OR “elementary education”	“reading method*” OR “reading intervention*” OR “reading implementation*” OR “reading practice”	“reading abilit*” OR “reading competence*” OR “reading skills” OR “reading capacit*”.
Searches	<b>In Scopus:</b> TITLE/ABS/KEY [1] AND TITLE/ABS/KEY [2] AND TITLE/ABS/KEY [3] <b>In WoS:</b> TOPIC [1] AND TOPIC [2] AND TOPIC [3]. <b>In ERIC:</b> ABSTRACT [1] AND ABSTRACT [2] AND ABSTRACT [3].		

Source: Developed by the authors.

## Inclusion and exclusion criteria

The PICO strategy (Methley et al., 2014) was also used to design the inclusion and exclusion criteria of the studies in a comprehensive, unbiased manner (Table 2). Articles with qualitative, quantitative and

mixed designs were selected, while literature review studies were excluded.

**TABLE 2.** Inclusion and exclusion criteria formulated using the PICO strategy

	<b>Population</b>	<b>Intervention</b>	<b>Outcomes</b>
<b>Inclusion criteria</b>	PE students	(Curricular) reading intervention that details its procedure	Reporting on the development of reading skills, abilities or competence
<b>Exclusion criteria</b>	Students in early childhood and secondary education, baccalaureate, vocational education, university education and non-formal education.	Co-curricular or extracurricular intervention for writing or reading and writing literacy skills, with Chinese characters or calligraphy.	Reporting on the development of attitudes towards reading

Source: Developed by the authors.

## Selection process

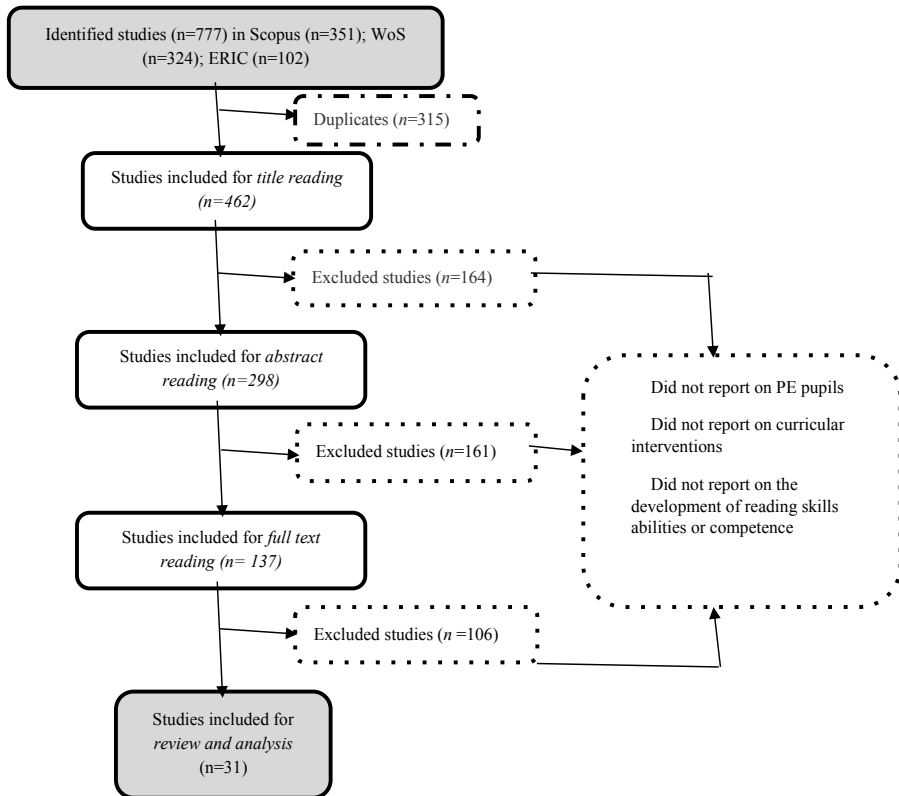
The study selection process underwent several stages and was carried out by the three researchers who were responsible for the study (Figure 1). A total of 777 studies were identified in the Scopus, WoS and ERIC databases in the first stage. Literature references were exported to Excel, thus eliminating duplicate documents (n=315). This yielded a total of 462 studies to be reviewed.

In accordance with the inclusion and exclusion criteria (Table 2), the 462 articles were title screened. This process resulted in 164 research studies being excluded, as they did not meet the inclusion criteria. The same process was then carried out in which the abstract of the 298 studies was reviewed and 161 were excluded. The outcome of this last stage was a total of 137 articles to be analysed.

During the screening stage, the three researchers independently reviewed the full text of these 137 papers and those that did not meet

the criteria (n=106) were eliminated. The full process yielded a total of 31 articles for review and detailed reading.

FIGURE I. Study selection procedure flow chart



Source: Developed by the authors.

## Quality assessment

The quality of the studies was assessed by using the checklists of assessment criteria developed by CASP (2022). All the selected studies met these criteria.

## **Data analysis**

In order to systematically organise the most important information from the selected studies, different variables were recorded and grouped into the following categories: intervention variables (reading competence, metalinguistic ability, type of activity, resource used), participant variables (country; school year; profile characteristics, taking into account advantaged, neutral and disadvantaged circumstances), context variables (PE schools and studies between 1996 and 2021), methodological variables (studies with qualitative, quantitative and mixed designs) and extrinsic variables (studies published in high-impact journals). To systematise and analyse the data, two complementary tools were used to systematise and analyse the data: Excel spreadsheets and Atlas ti (version 9.02).

## **Results**

In order to define a frame of reference for the 31 interventions, the descriptive data of the studies analysed are presented below.

### **Descriptive analysis of the literature under study**

Of the 31 articles analysed, 26 evaluated the effect of an intervention to improve the reading competence of different profiles of PE students, whereas 5 compared the effects of interventions for the development of specific reading skills.

The selected papers had been published in various journals. In total, 28 journals were identified, which were focused on education (14 out of 31), psychology (9 out of 31), linguistics (3 out of 31), computer applications (3 out of 31), and occupational therapy (1 out of 31). There was also a multidisciplinary journal.

Between 1996 and 2014, one article was identified each year that answered the research question posed and met all of the inclusion criteria. From 2014 onwards this trend increased, as can be seen in Chart 1. Taking into account that the search for studies was carried out in



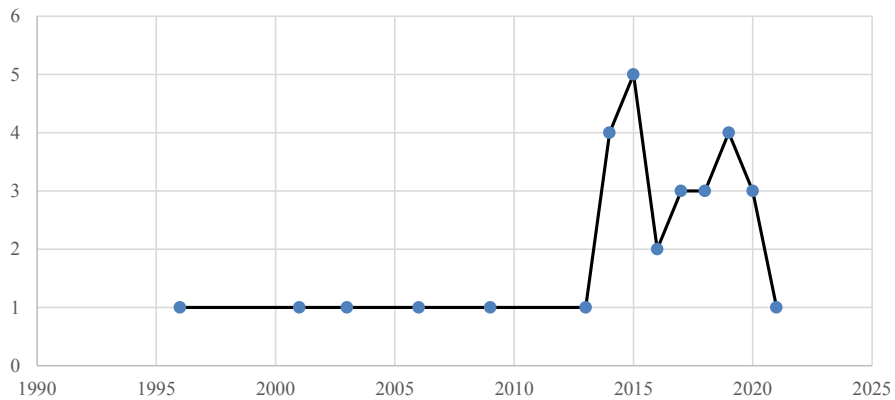
March 2021, it cannot be concluded that this trend will either continue or decrease from 2021 onwards.

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**CHART 1.** Number of publications per year

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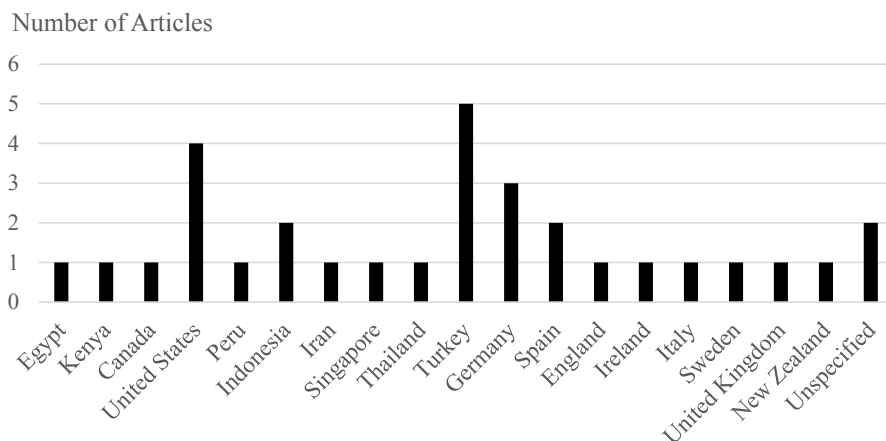
Number of Articles



Source: Developed by the authors.

Interventions were identified in 18 countries (Chart 2). Turkey was the country with the highest number of interventions (5 out of 31), followed by the United States (4 out of 31), Germany (3 out of 31), Indonesia (2 out of 31) and Spain (2 out of 31).

CHART 2. Number of publications per country



Source: Developed by the authors.

The objectives and general results of the 31 articles analysed are provided below (Table 3).

TABLE 3. Objective and overall results of the selected studies.

Focus	Article		Overall results
Assessing and describing interventions	Abdulkader et al. (2009)	Quantitative	Improved comprehension and word recognition
	Arnaud & Gutman (2020)		Improved recognition and decoding
	Bowen & Yeomans (2002)		Reading support
	Di Giacomo et al. (2016)		Stimulated learning and improved silent reading and comprehension
	Ghanaat et al. (2017)		Improved reading skills
	Levlin & Nakeva (2020)		Improved word reading
	Müller et al. (2015)		Improved reading competence
	Müller et al. (2017)		Improved word recognition and fluency
	Regan et al. (2014)		Helped master decoding
	Abrami et al. (2016)		Improved reading comprehension
	Akyol & Ketenoglu (2018)	Mixed	Improved reading comprehension and reading errors
	Archambault et al. (2018)		Improved reading fluency in English and French
	Griffin & Murtagh (2015)		Increased vocabulary, word recognition, accuracy, fluency and comprehension
	Hernández-Valle & Jiménez (2001)		Improved word recognition skills
	Li (2015)		Broadened vocabulary and increased interest in reading
	Maipoka & Soontornwipast (2021)		Improved vocabulary and reading comprehension
	Novianti et al. (2019)		Improved reading ability
	Robson et al. (2015)		Improved fluency skills
	Spencer (1996)		Improved reading performance through 'Mastery Learning'
	Thorne et al. (2013)		Improved vocabulary and reading comprehension of narrative texts
	Ulu & Akyol (2016)	Helped eliminate reading and comprehension errors	
	Aşıkcan & Saban (2021)	Qualitative	Improved fluency
	Akyol & Boyacı-Altınay (2019)		Helped to read aloud and identify new sounds
	Dowrick et al. (2006)		Improved reading fluency
	Nurani & Mahendra (2019)		Helped to associate letters and images
Yildirim et al. (2015)	Improved reading comprehension, automaticity and accuracy		

Comparing effects of interventions	Calet et al. (2017)	Quantitative	Improved prosody training, more than training in automaticity, speed, accuracy, prosody and reading comprehension
	Denton et al. (2014)		Explicit instruction fostered decoding, fluency and comprehension more than guided reading
	Gholami et al. (2016)		Phonetic, holistic and mixed methods reduced reading errors in irregular words
	Jones et al. (2018)		Direct instruction (DI) led to better results than computer-assisted instruction (CAI)
	Völlinger et al. (2018)	Mixed	Fluent and strategic reading had a positive effect on reading comprehension

Source: Developed by the authors.

## Content analysis of studies

The results were outlined along six axes (Table 3): learner profile, specific reading competences, metalinguistic skills, types of activities and resources used.

**TABLE 4.** Summary of the content analysis of the studies

Article	Student profile	Acquisition level	Metalinguistic ability	Type of activities	Resource
Abdulkader et al. (2009)	RDs (Reading difficulties) Year 5 60 students	Executive Functional	Fluency, vocabulary, reasoning	Dual, Structural and Generative Mnemonics	Printed and games
Abrami et al. (2016)	Country with low literacy levels Year 2 429 students	Executive	Decoding, fluency, reasoning, memory	Language Modelling and Dual Mnemonics	Digital
Akyol & Ketenoglu (2018)	Dyslexia; No cognitive, visual and auditory impairments Year 3 1 student	Executive	Decoding, fluency, vocabulary, memory	Language Modelling and Dual Mnemonics	Printed
Akyol & Boyaci-Altinay (2019)	Learning difficulties Year 4 1 student	Executive	Decoding, fluency	Language Modelling and Generative	Printed and games

Archambault et al. (2019)	RDs Year 3 3 students	Executive	Decoding, fluency	Language Modelling	Printed
Arnaud & Gutman (2020)	Low socio-economic status; Low-level readers 1st and 2nd years 11 students	Functional Executive	Decoding, fluency, vocabulary, cohesion, reasoning, memory	Structural and Generative	Printed
Aşıkcan & Saban (2021)	RDs Low socio-economic status Year 3 27 students	Executive	Decoding, fluency	Generative	Printed and audiovisual
Bowen & Yeomans (2002)	Mainstream classroom 2nd, 3rd, 4th years 43 students	Executive	Decoding, fluency, vocabulary	Language Modelling and Dual Mnemonics	Digital
Calet et al. (2017)	Middle class 2nd and 4th years 122 students	Executive	Decoding, fluency	Language Modelling	Printed
Denton et al. (2014)	RDs; Low socio-economic status 1st and 2nd years 1942 students	Executive	Decoding, fluency, vocabulary	Language Modelling and Dual Mnemonics and Generative	Printed and manipulated
Di Giacomo et al. (2016)	RDs; high ability Year 4 144 students	Executive	Decoding, fluency, vocabulary, reasoning	Language Modelling and Dual Mnemonics and Generative	Digital
Dowrick et al. (2006)	RDs; risk of academic failure; family special needs Year 1 10 students	Executive	Decoding, fluency, vocabulary, reasoning	Language Modelling and Contextual Mnemonics	Printed, manipulated, games and audiovisual
Gholami et al. (2016)	RDs Year 2 12 students	Executive	Decoding	Language Modelling	Manipulated and printed
Griffin & Murtagh (2015)	Low-level readers 2nd, 3rd, 4th, 5th and 6th years 20 students	Executive	Decoding, fluency	Language Modelling and Dual Mnemonics	Printed
Hernández-Valle & Jiménez (2001)	Low-level readers Year 2 34 students	Executive	Decoding	Language Modelling	Manipulated

Jones et al. (2018)	Learning difficulties; L2; Mainstream classroom 1st, 2nd, 3rd, 4th, 5th and 6th years 321 students	Functional Executive	Decoding, fluency, vocabulary, cohesion, reasoning, memory	Dual Mnemonics, Contextual Mnemonics and Generative Mnemonics	Illustrations, manipulated and audiovisual
Levlin & Nakeva (2020)	RDs Year 1 267 students	Executive	Decoding	Language Modelling	Games and audiovisual
Li (2015)	Mainstream classroom Year 1 52 students	Functional Executive	Vocabulary, memory	Generative	Printed and digital
Maipoka & Soontornwipast (2021)	L2 Year 6 11 students	Functional Executive	Decoding, vocabulary, cohesion, reasoning	Language Modelling and Generative	Printed
Müller et al. (2015)	Mainstream classroom Year 4 265 students	Functional Executive	Decoding, fluency, vocabulary, cohesion, reasoning, memory	Contextual and Generative Mnemonics	Games
Müller et al. (2017)	RDs Year 2 75 students	Executive	Decoding	Language Modelling	Printed
Novianti et al. (2019)	RDs; Dyslexia 2nd, 3rd, 4th years 4 students	Executive	Decoding, fluency, vocabulary	Language Modelling	Printed and manipulated
Nurani & Mahendra (2019)	RDs Year 2 Not stated	Executive	Decoding, fluency	Language Modelling and Dual Mnemonics	Printed
Ghanaat et al. (2017)	RDs; Dyslexia Year 2 3 students	Executive	Decoding	Language Modelling and Generative	Digital, printed, games and audiovisual
Regan et al. (2014)	RDs 4th and 5th years 5 students	Executive	Decoding, fluency, vocabulary	Language Modelling and Generative	Digital
Robson et al. (2015)	Low socio-economic status 2nd, 3rd, 4th years 11 students	Executive	Decoding, fluency	Language Modelling	Digital
Spencer (1996)	RDs 1st and 5th year 4 students	Executive	Decoding	Language Modelling	Digital

Thorne et al. (2013)	Low socio-economic status Year 5 88 students	Executive Functional	Decoding, vocabulary, reasoning	Language Modelling and Generative	Printed
Ulu & Akyol (2016)	RDs Year 3 1 student	Executive	Decoding, vocabulary	Language Modelling and Contextual Mnemonics	Printed
Völlinger et al. (2018)	Mainstream classroom Year 3 140 students	Executive	Decoding, vocabulary	Generative	Printed and manipulated
Yildirim et al. (2015)	Low socio-economic status Year 2 1 student	Executive	Decoding, vocabulary	Language Modelling	Printed

Source: Developed by the authors.

## Profile of learners targeted by the interventions analysed

Of the 31 studies, 27 specified the schoolyears in which students were. As some of the interventions operated on more than one level, Table 5 shows a higher absolute frequency of characteristics (51) than the number of articles analysed (31).

**TABLE 5.** Schoolyear in which the interventions took place

Schoolyear	Absolute frequency	Relative frequency
Year 1	7	13.73
Year 2	15	29.41
Year 3	10	19.61
Year 4	10	19.61
Year 5	6	11.76
Year 6	3	5.88

Source: Developed by the authors.

The schoolyear that was most frequently considered for carrying out reading interventions was Year 2 (29.41%). This is likely to be the

case because the acquisition of reading skills has already started at this stage and therefore any difficulties students may have in developing their reading competence could begin to be identified. Year 3 and Year 4 students were also frequently considered (19.61%). The reason might be, firstly, that, if reading skills have not yet been acquired at these stages, it would be problematic; and secondly, that RDs would be detected in these age groups.

Following an affinity criterion, and based on an inductive analysis, Table 4 identifies three macro-categories made up of 13 different categories.

**TABLE 6.** Characteristics related to the student profile

<b>Macro Category</b>	<b>Category</b>	<b>Absolute frequency</b>	<b>Relative frequency</b>
Advantaged circumstances	High reading performance	1	2.38
	No apparent cognitive, visual and auditory problems	1	2.38
Total		2	4.76
Neutral circumstances	L2	2	4.76
	Mainstream classroom	5	11.90
	Middle class	1	2.38
Total		8	19.05
Disadvantaged circumstances	Reading difficulties	15	35.71
	Low-level readers	3	7.14
	Country with low literacy levels	1	2.38
	Dyslexia	3	7.14
	Learning difficulties	2	4.76
	Risk of academic failure	1	2.38
	Low socio-economic status	6	14.29
	Special needs due to family circumstances	1	2.38
Total		32	76.19

Source: Developed by the authors.



As can be seen in Table 6, the vast majority of interventions were targeted at students living in disadvantaged circumstances (76.19%), while students living in advantaged circumstances were the least frequently considered in interventions (4.76%). In fact, the interventions that were focused on students living in advantageous circumstances did so in order to contrast their performance with learners living in disadvantaged circumstances (Di Giacomo et al., 2016).

For the 13 categories identified, the students most commonly included in reading interventions were those with RDs (35.71%). Therefore, the vast majority of the intervention proposals reviewed were carried out as a remedial strategy for reading difficulties. Thus, efforts were directed at trying to solve an existing problem, rather than implementing interventions that could help prevent it.

The profile targeted by the interventions corresponded to students with low socio-economic status (14.29%). This interest could be due to the influence of socio-economic status on academic performance and on students' cognitive development (Espinoza & Rosas, 2019). Studies have shown that students from socio-economically disadvantaged families develop their language skills more slowly and are at a higher risk of developing RDs (Urquijo et al., 2015). Thus, the acquisition of reading competence in these students makes it possible to compensate for the lack of cultural capital that students who are not economically disadvantaged receive from their families (Eyzaguirre & Fontaine, 2008).

## **Competences addressed in the interventions**

In 24 of the 31 interventions reviewed there was a predominance of the executive level, while skills related to the executive and functional levels were the focus of 7 of them. This involved a tendency to interventions aimed at strengthening skills fundamentally related to mastering the translation of messages from the oral to the written code and vice versa (Monje Margelí, 1993). Only in a very small number of papers was functional acquisition developed, the command of which involves not only the interpretation of the code, but also the ability to transfer reading skills to the everyday needs of social life (Monje, 1993).

This tendency to promote the executive level could be regarded as logical taking into account that a large part of the interventions took

place in the first years of PE. However, this is distorted in the overall analysis, as the trend was maintained in the interventions carried out in Years 4, 5 and 6.

These data reveal an absence of interventions to develop skills at the instrumental and epistemic levels. In other words, in the proposals analysed, the aim was not for students to develop their ability to search for and record information, nor to use reading creatively and critically.

### Metalinguistic skills developed in the interventions

Six levels of reading acquisition skills were identified, based on the activities carried out in the interventions (Table 7).

**TABLE 7.** Frequency with which metalinguistic skills were addressed in the interventions analysed.

Skill	Absolute frequency	Relative frequency
Decoding	29	34.52
Fluency	21	25.00
Vocabulary acquisition	16	19.05
Reasoning in reading comprehension	8	9.52
Working memory	6	7.14
Sentence construction and cohesion	4	4.76

Source: Developed by the authors

As can be seen in Table 7, the reading acquisition skill that was most frequently addressed was decoding (34.52%). This is possibly related to the fact that most of the interventions involved Year 1 and Year 2 students, the levels at which this recognition skill is most strongly focused on. Moreover, the predominance of this skill may lie in that it is the basis for progressing towards developing other skills.

Only 3 of the interventions included in the study aimed to develop all 6 reading comprehension skills. One might think that this would be because upper primary school students were included in these interventions.

However, one of them was aimed at Year 1 and Year 2 students, one in Year 2, and one between Year 1 and Year 6. In contrast, there were also six interventions that focused on only one comprehension skill, which in all cases was decoding.

## Types of teaching and learning activities

In the analysis of the 31 studies, 247 teaching and learning activities were identified and categorised into 5 types (Table 8).

**TABLE 8.** Types of teaching-learning activities identified

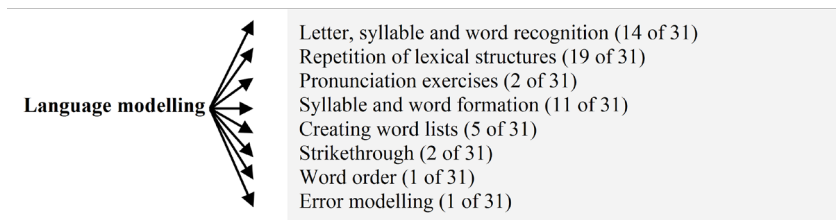
Activity Type	Absolute frequency	Relative frequency
Language Modelling	23	44.21
Generative	14	26.92
Dual Mnemonics	9	17.30
Contextual Mnemonics	4	7.69
Structural	2	3.84

Source: Developed by the authors.

17 of the 31 papers used different types of activities in their implementation, while 13 of the 31 used a specific one. A total of 10 papers were found with only language modelling activities, and 3 with generative activities.

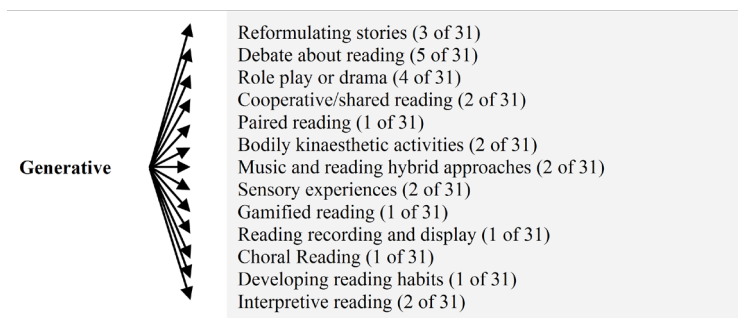
The most recurrent activities were language modelling activities, that is, procedures related to code mastery or normative linguistic aspects and related to the executive level of competence acquisition (Table 8). These activities were linked to pedagogical exercises of more traditional methods such as grammar or direct methods. They essentially featured two pedagogical mechanisms, repetition and trial-and-error (Figure 2). This predominance showed a strong tendency to use traditional, code-centred methods and analytical exercises (Marí et al., 2019).

**FIGURE 2.** Language modelling activities identified



Generative activities were the subject of 14 of the 31 papers analysed (Figure 3). The pedagogical aim of these exercises was the integration of new knowledge and the application of the contents addressed in other learning formats (Martín et al., 2008). Specifically, they are used in what has been called the communicative pedagogical approaches to language, which encourage the integration of disciplinary content and the development and the promotion of different generic competences (Villarroel & Bruna, 2014).

**FIGURE 3.** Generative activities identified

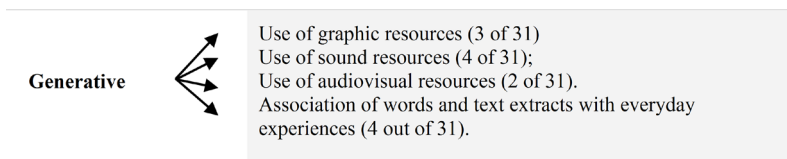


The strong presence of this type of activity in the interventions analysed may be due to the fact that, within the communicative approach,

learning the code is an activity that seeks to encourage students to read (Tovar & Riobueno, 2018).

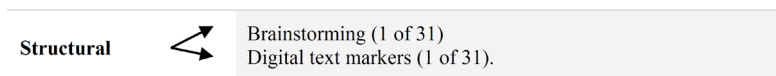
Mnemonic activities are those that enable learners to memorise and retain words and meanings through external resources. Two types of strategies were identified within these activities in the studies. Dual strategies, which involved sound, graphic or visual representations (9 out of 31); contextual strategies, which seek to promote retention and fixation of meanings through experiences close to everyday life (4 out of 31). The development of mnemonic activities (Figure 4) was of high pedagogical value, as it operated specifically as an indicator of reading performance and overall academic achievement (Guzmán et al., 2017).

**FIGURE 4.** Mnemonic activities identified



Finally, structural activities were also identified. These are activities that allow the student to develop cognitive strategies for encouraging writing. This typology was found in 6.4% of the studies analysed (2 out of 31). The following exercises were identified: brainstorming (1 out of 31) and digital text markers (1 out of 31).

**FIGURE 5.** Identified Structural Activities



## Resources used in the interventions analysed

The analysis yielded a total of 79 teaching resources that were categorised into 5 typologies (Table 9).

**TABLE 9:** Types of resources identified in the interventions analysed.

Resource types	Absolute frequency	Relative frequency
Printed	21	45.68
Digital	8	17.02
Manipulated	7	14.89
Games	6	12.76
Audiovisual	5	10.63

Source: Developed by the authors.

The frequent use of printed resources could be explained by the fact that interventions were mainly carried out with disadvantaged students. In such cases, textbooks are provided free of charge by the Ministry of Education, and therefore these printed materials become the main didactic tool for teachers (Aguirre, 2015). It is also considered one of the most widely used resources to increase learning opportunities (Ibáñez et al., 2017). In addition, the use of printed and manipulated resources and of games have the advantage over digital and audiovisual resources that they do not require managing technological resources. These types of resources facilitate the work of those teachers who do not have the necessary skills to implement learning environments rich in digital or audiovisual resources.

Finally, the presence of digital resources as a mediation strategy for learning to read in PE could be due to the progressive incorporation of ICT in formal education systems. These technologies can be strategic actions that enable teachers to design activities that take into account students' different learning speed and potential. Therefore, the use of digital resources constitutes a strategy for the development of people's cognitive potential and, specifically, for the acquisition of reading skills (Mendoza, 2018).

## Conclusions

The objective of this rigorous systematic review was to analyse the complex spectrum of interventions that have been used to improve reading competence in PE students. A series of conclusions can be drawn from the 31 studies reviewed.

First, the interventions analysed were remedial in nature. The studies were mainly carried out in year groups where the difficulties in executive levels such as decoding and basic reading comprehension begin to become apparent. Moreover, students targeted in these interventions corresponded to profiles related to disadvantaged circumstances such as low socio-economic levels or learning difficulties.

These results show, on the one hand, that there is a lack of interventions aimed at promoting reading development in students who are not disadvantaged. On the other hand, they highlight the need for new pedagogical and didactic strategies to help reduce or prevent RDs. Thus, the implementation of reading promotion activities should start from the first year of primary school. In fact, considering the act of reading as a cognitive process, it is clear that learners should be encouraged to develop their own habits before starting to read a text. This would promote early identification of reading and text comprehension difficulties, enabling the transition to functional competence levels in later schoolyears.

Secondly, the studies analysed highlighted the executive nature of the interventions to improve reading competence. All the studies involved actions that enhanced executive skills, whereas only a relative few developed functional competence (skills). The remedial nature of the interventions makes it difficult to develop instrumental or epistemic aspects. This means that reading is largely characterised in these studies as a passive activity, which suggests that there is a need to develop competences that enhance generative, creative or critical reading abilities. The promotion of active methods and techniques can be a key element to do this. There is also a need to rethink reading habits and spaces. Reading exercises should be carried out on new terms that allow for reading experimentation, bringing reading themes closer to events or actions directly related to the students' daily life.

Thirdly, the interventions carried out to date have favoured metalinguistic skills related to traditional pedagogical schemes that promote learning structures based primarily on decoding or fluency

exercises. Again, this shows the need to structure didactic designs that enhance features of vocabulary acquisition, meaning construction, reasoning and working memory.

Fourthly, the most recurrent teaching-learning activities were those that proposed reading instruction on the basis of language modelling. Once again, the traditional paradigm of language teaching prevails; two activities play a major role within this paradigm: learning by repetition, and through trial and error. It seems clear that the more traditional didactic strategies of grammar teaching models and direct methods continue to have a strong influence on current interventions as well.

Although there was no evidence of activities that enhanced instrumental or epistemic competences, activity structures of a generative nature were emerging in some studies, especially in the most recent ones analysed. For example, under the influence of gamification methodologies or dialogic gatherings, new activity formats are appearing such as reading debates, story reconstruction or gamified reading. However, the pedagogical approach used in these activities is still based on a functional framework which privileges interpersonal communication, without allowing access to other knowledge or linking language and thought (instrumental and functional levels).

While this review has met its objective, some limitations can also be identified. Firstly, only articles written in Spanish and English were included, and therefore texts in other languages were excluded. In future publications, it would be desirable to extend the review. Secondly, the studies reviewed were extracted from journals indexed in the Scopus, ERIC and WoS databases. Consequently, further research could include other national and international databases that cover other genres.

In terms of the implications derived from the study, the systematic review carried out obtained an accurate picture of the literature on interventions for the development of reading skills. The study also has implications for pedagogy and teaching and learning processes. Some essential aspects for future teaching action have been pointed out, highlighting those elements referring to specific reading competences and skills, types of activities and didactic resources used for teaching reading practice in recent decades. This study has also identified trends in reading interventions, noting the need for further progress in reading practices. Specifically, a need has emerged to move towards an active



and process-based approach to reading, which inherently involves the implementation of instrumental and functional structuring activities.

The research presented is an important step forward in the review of interventions that have been developed within reading competence internationally. It is therefore a detailed study of the interventions carried out and an immersion in the core characteristics of these educational actions: competences, skills, activities and resources used. The results can help the educational community to see how reading is currently developed in PE and are an invitation for the teaching community to strengthen the weaker aspects associated with the more traditional trends in teaching reading, while persevering in the more noteworthy aspects.

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## References

- Abdulkader, F., Gundogdu, K., & Eissa, M. (2009). The effectiveness of a multiple intelligences- based program on improving certain reading skills in 5th-year primary learning disabled students. *Electronic Journal of Research in Educational Psychology*, 7(2), 673–690.
- Abrami, P., Wade, C., Lysenko, L., Marsh, J., & Gioko, A. (2016). Using educational technology to develop early literacy skills in Sub-Saharan Africa. *Education and Information Technologies*, 21(4), 945–964. <https://doi.org/10.1007/S10639-014-9362-4>
- Aguirre, J. (2015). El manual escolar como objeto de investigación en historia de la educación: apuntes al texto de geografía. *Historia y Sociedad*, 28(1), 247–272. <https://doi.org/10.15446/HYS.N28.48129>
- Akyol, H., & Boyaci-Altinay, Y. (2019). Reading Difficulty and Its Remediation: A Case Study. *European Journal of Educational Research*, 8(4), 1269–1286. <https://doi.org/10.12973/eu-jer.8.4.1269>
- Akyol, H., & Ketenoglu, Z. (2018). Improving the reading skills of a students with reading difficulties: An action research. *Egitim ve Bilim*, 43(193), 143–158. <https://doi.org/10.15390/EB.2018.7240>

- Archambault, C., Mercer, S., Cheng, M. , & Saqui, S. (2019). Lire en Français: Cross-Linguistic Effects of Reading Fluency Interventions in French Immersion Programs: *Canadian Journal of School Psychology*, 34(2), 113–132. <https://doi.org/10.1177/0829573518757790>
- Arnaud, L., & Gutman, S. (2020). Effectiveness of an Occupational Therapy Reading Program for Low Socioeconomic First and Second Graders in an Urban Elementary School: A Pilot Randomized Controlled Study. *Journal of Occupational Therapy, Schools, and Early Intervention*, 13(3), 302–319. <https://doi.org/10.1080/19411243.2020.1732260>
- Aşıkcan, M., & Saban, A. (2021). An Action Research on Improving Fluent Reading Skills of Third-Grade Primary School Students. *TED EĞİTİM VE BİLİM*, 46(205), 19–47. <https://doi.org/10.15390/EB.2020.9015>
- Ball, E., & Blachman, B. (1991). Does Phoneme Awareness Training in Kindergarten Make a Difference in Early Word Recognition and Developmental Spelling? *Reading Research Quarterly*, 26(1), 49–66. <https://doi.org/10.1598/RRQ.26.1.3>
- Bowen, P., & Yeomans, J. (2002). Focus on practice: Accelerating the progress of failing readers: An evaluation of the enable-plus programme pilot study. *British Journal of Special Education*, 29(4), 170–177. <https://doi.org/10.1111/1467-8527.00265>
- Bowyer-Crane, C., Snowling, M., Duff, F., Fieldsend, E., Carroll, J., Miles, J., Götz, K., & Hulme, C. (2008). Improving early language and literacy skills: differential effects of an oral language versus a phonology with reading intervention. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 49(4), 422–432. <https://doi.org/10.1111/J.1469-7610.2007.01849.X>
- Brigman, G., Webb, L., & Campbell, C. (2018). Building Skills for School Success: Improving the Academic and Social Competence of Students: *Professional School Counseling*, 10(3), 279–288. <https://doi.org/10.1177/2156759X0701000310>
- Cain, K. (2010). Reading development and difficulties. BPS Blackwell.
- Calet, N., Gutiérrez-Palma, N., & Defior, S. (2017). Effects of fluency training on reading competence in primary school children: The role of prosody. *Learning and Instruction*, 52, 59–68. <https://doi.org/10.1016/J.LEARNINSTRUC.2017.04.006>
- Camarillo, B., Silva, G., & Romero, S. (2021). El Modelo Simple de Lectura en la identificación de dificultades lectoras en educación primaria. *Estudios pedagógicos* 47(3), 343-357.

- Connelly, V., Thompson, B., Fletcher-Flinn, C., & McKay, M. (2009). Does the type of reading instruction have an influence on how readers process print? : Research Bank. In C. Wood & V. Connelly (Eds.), *Contemporary perspectives on reading and spelling* (1st Editio). Routledge.
- Critical Appraisal Skills Programme. (2022). *CASP Systematic Review Checklist*. <https://casp-uk.net/referencing/>
- Denton, C., Fletcher, J., Taylor, W., Barth, A., & Vaughn, S. (2014). An Experimental Evaluation of Guided Reading and Explicit Interventions for Primary-Grade Students At-Risk for Reading Difficulties. *Journal of Research on Educational Effectiveness*, 7(3), 268–293. <https://doi.org/10.1080/19345747.2014.906010>
- Di Giacomo, D., Cofini, V., Di Mascio, T., Cecilia, M., Fiorenzi, D., Gennari, R., & Vittorini, P. (2016). The silent reading supported by adaptive learning technology: Influence in the children outcomes. *Computers in Human Behavior*, 55, 1125–1130. <https://doi.org/10.1016/J.CHB.2014.09.053>
- Dowrick, P., Kim-Rupnow, W., & Power, T. (2006). Video feedforward for reading. *Journal of Special Education*, 39(4), 194–207. <https://doi.org/10.1177/00224669060390040101>
- Espinoza, V., & Rosas, R. (2019). Diferencias iniciales en el proceso de acceso al lenguaje escrito según nivel socioeconómico. *Perspectiva Educacional*, 58(3), 23–45. <https://doi.org/10.4151/07189729-VOL.58-ISS.3-ART.955>
- Eyzaguirre, B., & Fontaine, L. (2008). *Las escuelas que tenemos* (Centro de Estudios Públicos (ed.). Centro de Estudios Públicos. <https://lyd.org/wp-content/uploads/2011/06/Loreto-Fontaine.pdf>
- Freebody, P., & Luke, A. (1990). Literacies programs: Debates and demands in cultural context. *Prospect: An Australian Journal of TESOL*, 5(3), 7–16.
- Ghanaat, E., Sadeghpour, N., Nejatyjahromy, Y., & Mir Nasab, M. (2017). The Effect of Cooperative Teaching on the Development of Reading Skills among Students with Reading Disorders. *Support for Learning*, 32(3), 245–266. <https://doi.org/10.1111/1467-9604.12168>
- Gholami, M., Shirazi, T., Nikookar, N., & Rahimi, A. (2016). Comparison of effectiveness of phonetic intervention, holistic intervention and mixed intervention on the rate and accuracy of reading skills of children with reading difficulty in grade 2. *The IOAE Journal*, 7(1), 270–276.

- Griffin, C., & Murtagh, L. (2015). Increasing the sight vocabulary and reading fluency of children requiring reading support: the use of a Precision Teaching approach, *31*(2), 186–209. <https://doi.org/10.1080/02667363.2015.1022818>
- Guzmán, B., Véliz, M., & Reyes, F. (2017). Memoria operativa, comprensión lectora y rendimiento escolar. *Literatura y Lingüística*, *35*, 377–402. <https://doi.org/10.4067/S0716-58112017000100377>
- Hernández-Valle, I., & Jiménez, J. (2001). Conciencia fonémica y retraso lector: ¿Es determinante la edad en la eficacia de la intervención? *Journal for the Study of Education and Development*, *24*(3), 379–395. <https://doi.org/10.1174/021037001316949284>
- Hwang, G., Chen, M., Sung, H., & Lin, M. (2019). Effects of integrating a concept mapping-based summarization strategy into flipped learning on students' reading performances and perceptions in Chinese courses. *British Journal of Educational Technology*, *50*(5), 2703–2719. <https://doi.org/10.1111/BJET.12708>
- Ibáñez, R., Moncada, F., Cornejo, F., & Arriaza, V. (2017). Los Géneros del Conocimiento en Textos Escolares de educación primaria. *Calidoscópico*, *15*(3), 462–476. <https://doi.org/10.4013/cld.2017.153.06>
- Johana Briggs Institute (2017). Critical Appraisal Checklist for Systematic Reviews and Research Syntheses. <https://bit.ly/3NXaflr>
- Jones, E., Larsen, R., Sudweeks, R., Richard Young, K., & Gibb, G. (2018). Evaluating Paraeducator-led Reading Interventions in Elementary School: A Multi-Cutoff Regression-Discontinuity Analysis. *Journal of Research on Educational Effectiveness*, *11*(4), 507–534. <https://doi.org/10.1080/19345747.2018.1481164>
- Levin, O., & Baratz, L. (2019). Reading in order to teach reading: Processive literacy as a model for overcoming difficulties. *L1 Educational Studies in Language and Literature*, *19*, 1–24. <https://doi.org/10.17239/L1ESLL-2019.19.01.08>
- Levlin, M., & Nakeva, C. (2020). An evaluation of systematized phonics on reading proficiency in Swedish second grade poor readers: Effects on pseudoword and sight word reading skills. *Dyslexia*, *26*(4), 427–441. <https://doi.org/10.1002/DYS.1669>
- Li, M. (2015). A study of using picture storybooks to increase chinese vocabulary of primary school students. *Open Cybernetics and Systemics Journal*, *9*(1), 2886–2889. <https://doi.org/10.2174/1874110X01509012886>

- Lockwood, C., Munn, Z., & Porritt, K. (2015). Qualitative research synthesis: methodological guidance for systematic reviewers utilizing meta-aggregation. *International Journal of Evidence-Based Healthcare*, 13(3), 179–187. <https://doi.org/10.1097/XEB.0000000000000062>
- Maipoka, S., & Soontornwipast, K. (2021). Effects of Intensive and Extensive Reading Instruction on Thai Primary Students' English Reading Ability. *LEARN Journal: Language Education and Acquisition Research Network*, 14(1), 146–175. <https://so04.tci-thaijo.org/index.php/LEARN/article/view/248687>
- Marí, M., Gil Lario, M., & Ceccato, R. (2019). Influencia de los métodos de enseñanza en el aprendizaje y desarrollo de la lectura. *International Journal of Developmental and Educational Psychology. Revista INFAD de Psicología.*, 3(1), 177–186. <https://doi.org/10.17060/IJODAE.2019.N1.V3.1467>
- Martín, E., García, L., & Torbay, A. (2008). Estrategias de aprendizaje y rendimiento académico en estudiantes universitarios. *International Journal of Psychology and Psychological Therapy*, 8(3), 401–412.
- Methley, A., Campbell, S., Chew-Graham, C., McNally, R., & Cheraghi-Sohi, S. (2014). PICO, PICOS and SPIDER: a comparison study of specificity and sensitivity in three search tools for qualitative systematic reviews. *BMC Health Services Research*, 14(1). <https://doi.org/10.1186/S12913-014-0579-0>
- Monje, P. (1993). La lectura y la escritura en la Escuela Primaria. *Revista Interuniversitaria de Formación Del Profesorado: RIFOP*, 18, 75–82.
- Müller, B., Richter, T., Karageorgos, P., Krawietz, S., & Ennemoser, M. (2017). Effects of a syllable-based reading intervention in poor-reading fourth graders. *Frontiers in Psychology*, 8. <https://doi.org/10.3389/FPSYG.2017.01635/BIBTEX>
- Müller, B., Richter, T., Križan, A., Hecht, T., & Ennemoser, M. (2015). Word recognition skills moderate the effectiveness of reading strategy training in Grade 2. *Learning and Individual Differences*, 40, 55–62. <https://doi.org/10.1016/J.LINDIF.2015.05.001>
- Novianti, R., Syihabuddin, & Rochyadi, E. (2019). Phonology-based reading instruction to improve dyslexic students' early reading ability. *Indonesian Journal of Applied Linguistics*, 9(2), 443–462. <https://doi.org/10.17509/IJAL.V9I2.20242>
- Nurani, R., & Mahendra, H. (2019). Use of Big Book Learning Media to Improve Students' Beginning Reading Skills in Primary Schools.

- Mimbar Sekolah Dasar*, 6(3), 330–340. <https://doi.org/10.53400/mimbar-sd.v6i3.22893>
- Page M., Moher D., Bossuyt P., Boutron I., Hoffmann T., Mulrow C. et al. (2021). PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. *The BMJ*, 160 (372). <https://doi.org/10.1136/bmj.n160>
- Regan, K., Berkeley, S., Hughes, M., & Kirby, S. (2014). Effects of Computer-Assisted Instruction for Struggling Elementary Readers. *Journal of Special Education*, 48(2), 106–119. <https://doi.org/10.1177/0022466913497261>
- Reid, G. (2016). *Dyslexia: A Practitioner's Handbook* (5th Edition). John Wiley and Sons Ltd.
- Robson, C., Blampied, N., & Walker, L. (2015). Effects of feedforward video self-modelling on reading fluency and comprehension. *Behaviour Change*, 32(1), 46–58. <https://doi.org/10.1017/bec.2014.29>
- Schardt, C., Adams, M., Owens, T., Keitz, S., & Fontelo, P. (2007). Utilization of the PICO framework to improve searching PubMed for clinical questions. *BMC Medical Informatics and Decision Making*, 7(16). <https://doi.org/10.1186/1472-6947-7-16>
- Solé, I. (2004). Capítulo X. Proyectos y programas de innovación en la enseñanza y el aprendizaje de la lectura y la escritura. In C. Monereo Font & N. Mollá Trill (Eds.), *La práctica psicopedagógica en educación formal* (Vol. 1, pp. 253–274). UOC.
- Spencer, K. (1996). Recovering reading using computer mastery programmes. *British Journal of Educational Technology*, 27(3), 191–203. <https://doi.org/10.1111/J.1467-8535.1996.TB00686.X>
- Thorne, C., Morla, K., Uccelli, P., Nakano, T., Mauchi, B., Landeo, L., Vásquez, A., & Huerta, R. (2013). Efecto de una plataforma virtual en comprensión de lectura y vocabulario: una alternativa para mejorar las capacidades lectoras en primaria. *Revista de Psicología (PUCP)*, 31(1), 3–35.
- Tovar, K., & Riobueno, M. (2018). El club de lectura como estrategia creativa para fomentar la lectura creativa en los estudiantes educación integral. *Revista de Investigación*, 42(94).
- Ulu, H., & Akyol, H. (2016). The Effects of Repetitive Reading and PQRS Strategy in the Development of Reading Skill. *Eurasian Journal of Educational Research*, 63, 225–242. <https://doi.org/10.14689/ejer.2016.63.13>

- Urquijo, S., Coni, A., & Fernandes, D. (2015). Relationship between reading and socioeconomic level in Argentine children. *Avances En Psicología Latinoamericana*, 33(2), 301–316. <https://doi.org/10.12804/APL33.02.2015.09>
- Villarroel, V., & Bruna, D. (2014). Reflexiones en torno a las competencias genéricas en educación superior: Un desafío pendiente. *Psicoperspectivas. Individuo y Sociedad*, 13(1), 23–34. <https://doi.org/10.5027/PSICOPERSPECTIVAS-VOL13-ISSUE1-FULLTEXT-335>
- Völlinger, V., Supanc, M., & Brunstein, J. (2018). Examining between-group and within-group effects of a peer-assisted reading strategies intervention. *Psychology in the Schools*, 55(5), 573–589. <https://doi.org/10.1002/PITS.22121>
- Wells, C. (1986). *The meaning makers: children learning language and using language to learn* (1st Editio). Heinemann.
- Yildirim, K., Ritz, E., Akyol, H., & Rasinski, T. (2015). Assisting a Struggling Turkish Student with a Repeated Reading Fluency Intervention. *The Reading Matrix: An International Online Journal*, 15(1), 252–261.

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