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PENSAR CON LÁPIZ Y PAPEL

APORTACIONES DE LA INVESTIGACIÓN A LA ENSEÑANZA DE LA ESCRITURA

THINKING WITH PENCIL AND PAPER

CONTRIBUTIONS FROM RESEARCH TO THE TEACHING OF WRITING

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A todas las maestras y maestros que enseñan a escribir y, con ello, a pensar.

Resumen

Si la inteligencia artificial generativa puede escribir por nosotros, ¿por qué es más importante que nunca enseñar a escribir en la escuela? La escritura no es un acto mecánico, sino una herramienta eficaz para estructurar el pensamiento, clarificar ideas y, en definitiva, aprender. Este artículo tiene como objetivo seleccionar y sintetizar las principales aportaciones de la investigación sobre cómo enseñar a escribir. Pone el foco en cómo utilizar la escritura para adquirir

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conocimientos en todas las áreas del currículo y, a partir de ellos, desarrollar el pensamiento crítico. Con este fin, se abordan sus componentes clave —desde las habilidades de transcripción hasta las estrategias de composición—, organizados mediante una analogía visual: la Bicicleta de la Escritura, que facilita su comprensión y la planificación didáctica. Asimismo, la fundamentación presentada puede servir a la función de asesoramiento que la inspección educativa ejerce en los centros.

Palabras clave: *Enseñanza de la escritura, escribir para aprender, instrucción explícita, habilidades de transcripción, estrategias de composición, autorregulación, inteligencia artificial generativa.*

Abstract

if generative artificial intelligence can write for us, why is it more important than ever to teach writing in school? Writing is not a mechanical act, but a powerful tool for structuring thought, clarifying ideas and, ultimately, learning. This article aims to select and summarise the main contributions of research on how to teach writing. It focuses on how to use writing to acquire knowledge in all areas of the curriculum and, based on this, develop critical thinking. To this end, it addresses its key components—from transcription skills to composition strategies—organised using a visual analogy: the Writing Bicycle, which facilitates understanding and teaching planning. Likewise, the rationale presented can serve the advisory function that educational inspection exercises in schools.

Keywords: *Writing instruction, writing to learn, explicit instruction, transcription skills, composition strategies, self-regulation, generative artificial intelligence.*

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Introduction

Teaching to write is, in essence, teaching to think. Writing is not simply a mechanical act of putting words on paper or on a screen; it is a complex cognitive process that structures and shapes thought. It is probably one of the most demanding forms of learning in the school curriculum. In writing, we are forced to organise our ideas, establish logical relationships between them and express them coherently. This process not only helps us to clarify what we think, but also allows us to discover new perspectives and deepen our understanding of the subject. In this sense, writing functions as a mirror of the mind: it reflects, refines and transforms our thinking.

Above all, teaching writing is an act of educational **justice and equity**, as it democratises access to knowledge. Unlike oral language, writing is a complex cultural invention that is not acquired naturally, but requires intentional, explicit and systematic instruction. The absence of such instruction has a particular impact on students from disadvantaged backgrounds and those with specific learning difficulties, perpetuating inequalities from an early stage, as Juel (1988) showed more than three decades ago. For this reason, providing structured and well-sequenced teaching is not only a pedagogical necessity, but also a firm commitment to a more equitable and inclusive educational future.

Similarly, learning to write strengthens students' ability to participate fully in society. Writing is not just academic learning, but a way of thinking that fosters reflection, communication and intellectual autonomy. In the words of Luri (2025): "Writing is thinking". From this perspective, the teaching of both writing and reading should not be understood as an end in itself within basic education, but as a fundamental means of **acquiring knowledge and thinking critically about it**.

Consequently, neither reading nor writing are substitutable practices in school: they are fundamental pillars of learning and are mutually reinforcing

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throughout the school career. In today's educational context, marked by a veneration for so-called 21st century skills, teaching through writing is rarely perceived as modern or innovative. However, as I will argue throughout this article, writing is a powerful **medium for learning** and a privileged tool for knowledge acquisition and reading comprehension in all curricular areas.

While the teaching of reading is increasingly supported by specific evidence-based programmes, writing is still relegated to the background or dealt with implicitly, often treated intuitively or as a mere by-product of reading. However, from the earliest stages of education, it is essential to implement structured programmes that promote the **explicit teaching of writing**.

Consistent with this approach, the **aim of** this article is to present the main research contributions to the teaching of writing. To do so, I will synthesise and organise the most effective practices, differentiating between two mutually reinforcing processes: **learning *to* write** (mastering its mechanisms) and **learning through writing** (using it as a tool for learning).

To facilitate understanding of this complex system, the article is organised as follows:

1. First, a visual analogy is presented - the **Writing Bicycle -** which integrates all the components of the act of writing and serves as a guide for planning its teaching.

2. This is followed by **transcription skills** - handwriting fluency and orthographic awareness - whose automation is indispensable for freeing up cognitive resources to enable the student to focus on the composition of ideas.

3. The next section is devoted to **composition strategies**, showing how the sentence, the paragraph and the whole text become powerful tools for thinking and learning in different curricular subjects.

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4. Subsequently, the role of **self-regulation and self-efficacy**, essential affective and metacognitive factors, is analysed, not only to write autonomously, but also to feel capable of doing so.

5. Finally, we provide some reflections and raise research questions in relation to **generative artificial intelligence** in the context of teaching writing.

1. The Writing Bicycle: an Analogy for Structuring Writing Instruction

> *When done systematically and sequentially, teaching students to write is tantamount to teaching them to think* (Judith Hochman and Natalie Wexler, 2017).

When we write, we are simultaneously retrieving information from memory, elaborating and reorganising ideas, applying linguistic rules, choosing the right words, tone and style according to the message we want to give and to whom it is addressed. All while coordinating fine movements and having the motivation to sustain a continuous effort to capture the thought on paper or on a screen. Writing is therefore a complex activity that requires the coordination of cognitive, linguistic, motor, affective and social aspects. Consequently, its teaching must be approached in a structured way and taking into account the elements involved.

Within this framework, I present the **Writing Bicycle**, a visual analogy that allows us to represent and plan the main components involved in the process of writing from the early years of schooling.

This proposal is based on complementary theoretical models with a broad empirical basis. I take as a starting point the "**Simple View of Writing**" (Juel et al., 1986), which distinguishes between transcription skills (handwriting/ typewriting and spelling) and composition skills. For the development of the latter, I adopt the pedagogical approach of Hochman and Wexler (2017) in "**The Writing**

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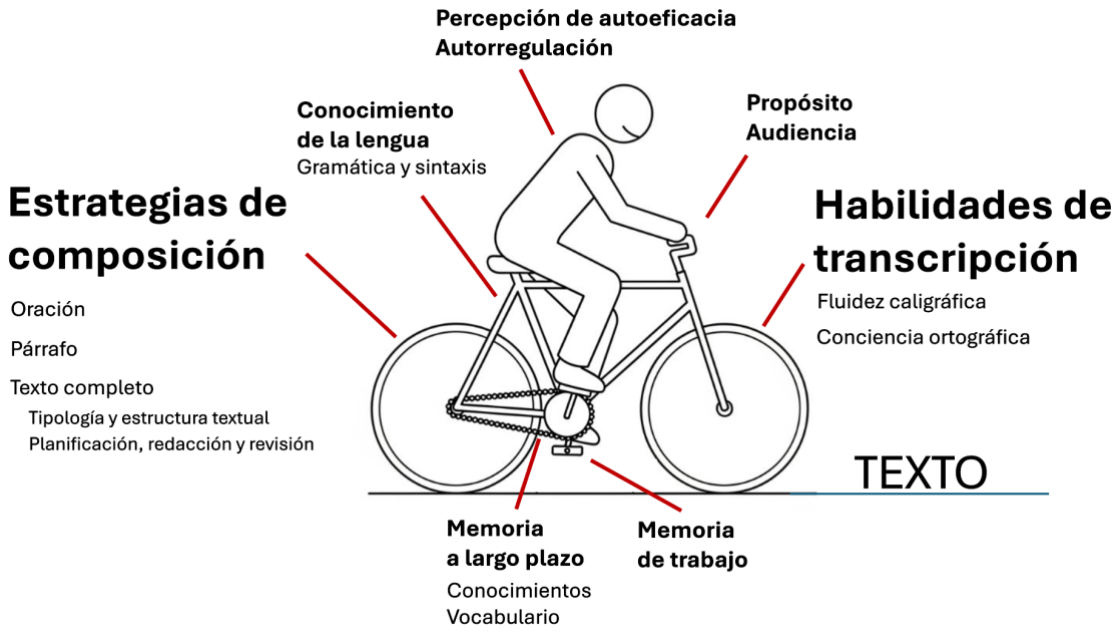
Revolution", focusing on the generation and organisation of ideas from sentence to paragraph.

This framework is enriched by the "**Not-so-Simple View of Writing**" (Berninger and Winn, 2006), which integrates executive functions (planning, revision, self-regulation) and emphasises the key role of working memory and long-term memory. In turn, the integration of the "**Writer(s)-Within-Community**" **model** (Graham, 2018), extends the approach by including essential socio-cognitive factors such as motivation, the writer's perception of self-efficacy (Pajares, 2003) and the importance of thematic and lexical knowledge (Olinghouse and Leaird, 2009). To didactically articulate all these elements, the explicit instructional framework of "The Writing Rope" (Sedita, 2023) is particularly useful.

Figure 1 represents the bicycle analogy that helps to visualise how the different components interact in writing (Figure 1):

Figure 1

Visual analogy of the coordinated system of components in writing



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1. The front wheel - the one that opens the way and contacts the paper first - symbolises the **transcription skills**: calligraphic fluency and orthographic awareness, essential for the text to progress legibly and accurately, but not sufficient to write a meaningful text.
2. The back wheel - the one that provides traction and transforms force into movement - represents **compositional strategies**. This is where the writer organises their ideas, structures paragraphs and develops content to drive the text forward with cohesion and coherence.
3. The pedals and the chain - the engine that generates and transmits power - reflect the joint action of **working memory** and **long-term memory**. They are the prior knowledge, vocabulary and ideas that the writer draws from their mind in order to move forward and sustain the writing effort.
4. The handlebars - the system for steering and controlling the trajectory - allude to **purpose** and **audience**, which are the elements that guide stylistic choices, tone and focus.
5. The bicycle frame - the structure that connects and supports all the other parts - represents **knowledge of language**: grammar and syntax. Its teaching has been shown to be most effective in primary education when it is addressed from a functional approach, integrated into the composition process (Graham et al., 2012; Kim et al., 2021).
6. Finally, the person who writes - the cyclist -: their **perceived self-efficacy**, confidence and ability to **self-regulate** are key motivational and metacognitive factors in moving forward.

This analogy emphasises that no part of the process can work in isolation: the bicycle does not run with only one wheel, both are necessary in the learning process. Nor is it possible to write without vocabulary and knowledge of how language works. This implies that while transcription skills should be automated in the early years, the learning of composition strategies should not be delayed,

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as these should be built from the beginning, in early childhood education, through oral language, teaching children to structure and express their ideas accurately long before they can write them down.

Accordingly, research on the teaching of writing in recent decades has led to a clear consensus: the most effective programmes, both for general learners and especially for those with learning difficulties, are those that adopt a **multi-component** approach, which explicitly and systematically integrates the different pieces that make up the act of writing (Graham et al., 2019; Kim et al., 2021; Kokkali and Antoniou, 2024).

2. Transcription skills: learning the mechanics of writing

> *Deftly, the youngster opens to a blank page and picking up one of his pens—the purple one—with his right hand, while holding the others with his left, begins to write. Yes, to write. The first thing that dazzles is the precision with which he holds the writing tool—he could write with a fountain pen and he wouldn't make a smudge—, with that finger position that every teacher fights to achieve, and sometimes fails to, when undertaking the heroic task of teaching how to write.* (Marisol Yelo, 2024)

Transcription skills - handwriting or typing fluency and mastery of spelling - are the fundamental mechanical processes for writing legibly, correctly and efficiently. The automation of these basic tasks is a key pedagogical goal, because the less conscious attention they require, the more working memory capacity is freed up for the complex processes of composition, such as organising ideas or revising text, which has a direct impact on the quality of writing (Abbott et al., 2010; Berninger et al., 1994, 2006; Graham et al., 1997; Limpo et al., 2017). This cognitive demand is especially high in the early years, where different attentional components are associated with different types of spelling

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errors, a relationship that attenuates as writing becomes more mechanised (Bigozzi et al., 2021). Let us address the two components separately.

2.1. Handwriting fluency

Why learn to write by hand in a digital world? Why is early childhood education so important in the teaching of handwriting? Tied or block letters, without or with a pattern, and with which one? Should pencil skills be taught? How and when? Is it convenient to do graphomotor exercises? Should handwriting be emphasised?

The ability to **trace letters and form words legibly and with sufficient speed and automaticity** - calligraphic fluency - is an essential skill in writing. It is essential to ensure its automaticity so that the effort devoted to transcription does not become a barrier that consumes excessive working memory resources, thus hindering the learning and development of more complex written composition processes (Graham et al., 1997; Kent and Wanzek, 2016; Medwell and Wray, 2008). We can see its relevance in ourselves when we try to write with the non-dominant hand: we will see that the attention required for this action immediately interferes with the fluency of thought and the clarity of what we want to express. When students do not have these mechanics automated, their ability to manage the cognitive demands of composition (generating ideas, choosing vocabulary, constructing sentences, organising, revising) is limited, affecting not only their written expression, but also their ability to learn and their motivation to write.

While keyboarding is essential in today's digital context, we will focus on **handwriting**, the teaching of which must precede digital writing and is **irreplaceable in early childhood and primary education.** Several research

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studies support this prioritisation by showing that the physical act of tracing letters - which involves complex fine motor-perceptual coordination - offers unique benefits. On the one hand, it favours the learning and recognition of letters, as graphomotor production improves their subsequent visual identification (Araújo et al., 2022; James, 2017; Longcamp et al., 2005; Mayer et al., 2020; Zemlock et al., 2018). On the other, it contributes to the development of specific functional brain networks in childhood (James and Engelhardt, 2012; James et al., 2016; Van der Meer and Van der Weel, 2024; Vinci-Booher, 2016). In this area, a recent review of neuroimaging studies confirms this idea, concluding that **handwriting activates a larger network of brain regions** - involved in motor, sensory and cognitive processing - than keyboard writing, which is associated with more passive cognitive engagement (Marano et al., 2025).

The relevance of handwriting for deeper processing is not limited to childhood, however. Studies such as Mueller and Oppenheimer (2014) have shown that college students who take notes by hand understand concepts better because they process information more reflectively than those who use computers, who tend to transcribe literally. This is evidence that **the physical act and the rhythm of handwriting favour greater cognitive engagement**, thus impacting learning.

From infancy, the brain learns letters not only as visual forms, but also as specific motor plans, and both types of information contribute to their recognition (Seyll et al., 2020). Thus, the cognitive and motor effort involved in manual tracing consolidates their mental representation, which supports the learning of reading and spelling (Longcamp et al., 2008; Suggate et al., 2023) and prevents difficulties in writing (Graham et al., 2000, 2012).

As in reading, **early childhood education lays the foundations for handwriting and phoneme-grapheme correspondence**. As has been shown, poor handwriting fluency in the early years can lead to persistent academic difficulties (Graham, 2009), so schools should carry out systematic, evidence-

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based instruction from this stage, both to ensure progress for all pupils and to detect and address potential difficulties early.

In this context, the **Response to Intervention** (RtI) **Model**, based on levels of support and continuous progress monitoring, has proven to be effective in identifying at-risk students and adjusting the pedagogical intervention according to their needs, thus preventing future learning disorders or minimising their impact (Jiménez, 2019). In this framework, the IPAE (*Indicadores de Progreso de Aprendizaje en Escritura*) has recently been validated as a useful and consistent instrument to assess transcription skills in first grade (Jiménez and García, 2023), allowing both early screening and monitoring of writing progress.

To achieve effective handwriting fluency, it is essential to organise and sequence the development of **fine motor skills and cognitive processes** in early childhood education, incorporating **multisensory** approaches. Research such as that of Gentaz et al. (2003) shows that integrating manual haptic modality - such as tracing letters with the finger - together with visual and auditory stimuli can enhance the benefits of early literacy programmes by strengthening the connection between form and sound. It is essential that this teaching takes place in a positive and trusting environment, where children enjoy learning, feel secure and valued, and learn to manage frustration in the face of mistakes.

At this point, the question arises as to what kinds of learning are conducive to the acquisition of the mechanics of writing in early childhood education. Studies such as that of Kim et al. (2011, 2015) point to the following as key predictors: **oral language**, **phonological awareness**, knowledge of the **alphabetic principle** and **fluency in letter tracing.** Regarding the latter, one approach supported by research is to start with uppercase print ("stick") letters, as their simple design facilitates initial motor control. This option is in line with the principle of motor learning specificity (Berninger and Winn, 2006), which indicates that it is more effective to practice directly the letters to be learned than to

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perform abstract graphomotor exercises, such as strokes or loops, whose effectiveness lacks solid empirical support (Hoy et al., 2011; Ripoll, 2022).

Although letters may seem simple, children require **fine motor control** (hand strength, differentiated finger and wrist movements) and **visual-motor coordination** (eye-hand) to reproduce their strokes accurately (Dinehart, 2014; Feder and Majnemer, 2007; Priyadi et al., 2024). Therefore, play activities that develop these skills - such as modelling plasticine, stringing beads, using tweezers, cutting out or building with blocks - are essential in early childhood education, as they prepare the neuromotor base for writing.

However, graphomotor learning does not develop in isolation, but on a **basis of global body control**, as writing integrates multiple systems: visual, proprioceptive, postural, attentional and motor planning (Abd El-Dayem et al., 2015; Capellini, 2017; Feder and Majnemer, 2007). Therefore, activities such as crawling, jumping, balancing, rolling, painting vertically, dragging, pushing or manipulating objects contribute to the postural stability, body awareness and coordination necessary for the fine movements of writing.

Once the stroke of capital letters has been mastered, the question arises as to which type of letter to teach, **lower case or cursive (linked)**, an aspect that generates intense debate. It is often argued that the former has the advantage of being simpler and more common in printed texts, thus making it easier to write and read, while italics, because of their continuity, could favour fluency, speed and better spacing between words, as well as reducing certain errors (e.g. letter reversals or irregular spacing). However, reviews in this field (Morales-Rando et al., 2022; Pulido and Thériault, 2022; Schwellnus et al., 2012a) do not find conclusive evidence that one typeface is more favourable over the other for initial learning, readability or speed, and stress that it is the quality and consistency of teaching that are the decisive factors. Along these lines, in the case of students with difficulties, success in learning to write relies more on systematic and

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personalised teaching than on the choice between cursive or print (Bray et al., 2021).

Parallel to the tracing of letters, it is essential to guide the physical and ergonomic aspects of handwriting from early childhood education, as they affect efficiency, legibility and comfort. The **pencil grip** is particularly important, and its learning is necessary to avoid difficulties in fluency, fatigue or pain (Schwellnus et al., 2012b). The current approach prioritises functionality - fine movements, pressure control and absence of tension - rather than a single model of pencil grip, accepting efficient grips such as the dynamic tripod or quadrupod (Ripoll et al., 2024).

Proper **body posture** (upright back, supported feet, correct table and chair height) is also key to allow controlled movements and avoid tension. Early intervention should integrate grasp and posture, as well as consider paper position and tilt (especially for left-handers) and lighting, factors that facilitate comfortable and efficient handwriting (Feder and Majnemer, 2007).

Finally, effective handwriting programmes devote specific time to teaching the **directionality** of strokes, modelling letter formation, verbalising their execution, practising in copy and from memory, recognising distinguishing features between similar letters, and encouraging self-assessment by comparison with a model (Ripoll et al., 2024). These strategies, especially useful in the early stages, promote essential motor and visual automatisms, and are supported by research (Bray et al., 2021; Feder and Majnemer, 2007; Graham and Harris, 2005).

In this framework, the use of appropriate **patterns** facilitates the explicit teaching of the size, shape and spatial location of each grapheme. In fact, recent research confirms that the patterning has a significant impact on the quality of schoolchildren's handwriting, particularly on word alignment and letter size consistency, regardless of their fine motor or visual-motor skills, which reinforces

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the usefulness of patterned paper as a teaching resource to improve legibility (Guilbert and Fernandez, 2024).

In summary, the aim here is to progressively automate handwriting (combining legibility and speed), freeing up working memory resources to allow the learner to focus on the complex processes of text composition. Table 1 lists the key issues and main ideas addressed in this section.

Table 1

Summary of key ideas on teaching handwriting fluency

Issue	Key idea
Importance of handwriting	Should be prioritised in the early stages for its unique benefits in child development.
Cognitive and motor benefits	Hand tracing consolidates letter learning and aids reading and spelling.
Predictors of learning	Oral language, phonological awareness, alphabetic principle and tracing fluency.
Early intervention	Preventive assessment and action improves outcomes and reduces the risk of difficulties.
Neuromotor preparation	Global body control activities are key to handwriting development.
Initial typeface	Block capitals facilitate learning because of their simplicity and motor control.
Block or print type	There is no universally better type; what is important is systematic and consistent teaching appropriate to individual needs.
Ergonomics in writing	A functional grip, good posture and a suitable environment are conducive to comfortable and efficient

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	writing.
Effective practices	Explicit modelling, use of pattern, guided practice, verbalisation of performance, recognising distinguishing features between letters and self-assessment.

2.2 Spelling awareness

Should spelling mistakes be corrected? When and how should this be done? Why is it still important to master spelling if digital correction is automatic? Is there empirical support for 'natural learning' of spelling? Should mistakes be marked or the solution given? Is dictation an appropriate technique for spelling improvement?

Spelling awareness, beyond mere knowledge of rules, is a person's ability - and willingness - to notice, reflect and act consciously on the rules and conventions necessary to write "well". It is not only knowing how to write something, but also being able to **detect errors, anticipate them, correct them and justify why** one option is more appropriate and effective in a given situation (Díez Mediavilla and Güemes Suárez, 2016).

Mastery of spelling is not only a matter of accuracy in writing, but also has a significant influence on the ability to produce coherent texts (Graham and Santangelo, 2014, Torkildsen et al., 2016). Indeed, its importance is such that spelling knowledge acquired in the early years of primary school has been shown to be a key predictor of students' spelling accuracy almost a decade later (Åsberg Johnels et al., 2024).

As with handwriting fluency, spelling must also become increasingly **automatic** in order to free up cognitive resources and allow the writer to

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concentrate on aspects of composition. Indeed, just as we interrupt our reading and find it difficult to extract meaning when we encounter words written in an unconventional way, if when we write we constantly doubt how words are spelled, our writing fluency and the overall quality of the text we produce is impaired.

Research shows that the acquisition of spelling is a complex process that **requires explicit, graded and systematic instruction** (Palombo and Cuadro, 2019; Pan et al., 2021; Treiman, 2018). In this regard, structured teaching of skills such as phonological awareness - the ability to recognise and manipulate phonemes - and spelling not only enhances writing, but also strengthens reading, establishing a reciprocal relationship (Graham and Santangelo, 2014; Kim et al., 2024). Studies in languages with consistent orthography such as German (Sigmund et al., 2024) and Spanish (Defior and Serrano, 2011) agree that phonemic awareness is essential for writing, finding that, in the early stages, learners rely mainly on phonological procedure and phoneme-grapheme conversion (Jiménez et al., 2008; Sánchez Abchi et al., 2009). Hence the importance of integrating activities that systematically develop **phonological awareness**, the **alphabetic principle** and **verbal memory** in early childhood and early primary education, minimising cognitive overload through clear instructions, task segmentation and explicit modelling by the teacher.

Despite the evidence, educational practices in many schools persist that are influenced by the idea of **'natural learning'** of spelling, which assumes its implicit acquisition through immersion in the written language - frequent reading and writing in communicative contexts - relegating the direct teaching of rules and patterns. This view has been challenged by research: Graham (2000), in his influential analysis "Should the natural learning approach replace spelling instruction", showed that, although exposure to reading and writing practice promotes spelling learning, relying solely on this approach is insufficient for most learners and much less effective than explicit instruction in spelling skills and

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knowledge (phonological, patterns, rules, morphology, etymology, semantics), especially for those with difficulties. In other words, relying on learners to discover complex linguistic relationships on their own is an ineffective and inequitable strategy.

Graham's critical stance aligns with research on psycholinguistics and learning difficulties in Spanish (Chimenti et al., 2025; Cuetos, 2009; Jiménez, 2019; Palazón, 2025), as well as with evidence-based teaching proposals (Moats, 2020; Ripoll, 2022), which stress the need for explicit and systematic instruction. In this line, Jiménez et al. (2008) analysed the evolution of writing in Spanish by differentiating between phonological orthography - sound-deducible by the alphabetic principle - and arbitrary orthography, which includes ruled orthography (applicable by specific rules, such as the use of *b* or *v*, *g* or *j*) and unruled orthography (words whose spelling is deduced neither by sound nor by rule and can only be learned by repeated exposure). Their results show that errors persist especially in arbitrary spelling, even when phonological coding is already mastered, confirming the need for **explicit, graded** and **sustained** teaching of phonological coding.

In this context, it is striking that many schools continue to organise spelling teaching according to the distinction between natural and arbitrary spelling proposed by Alexandre Galí in the 1920s (Galí, 1926), applying the former in the first years of primary school and reserving the latter for later stages. As Bigas et al. (2004) warn, this interpretation detracts from Galí's original intention and does not reflect the complexity of learning. Empirical evidence shows that arbitrary spelling -precisely the one that requires the most specific instruction- should not be relegated to advanced cycles, but should be addressed from the earliest stages through planning that combines explicit teaching of rules, systematic practice and strengthening of orthographic memory (Jiménez et al., 2008; Sánchez Abchi et al., 2009).

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From this perspective, given that explicit instruction is key to mastering spelling, it should not be limited to the subject of language. Correct spelling is essential for accurate communication in **all areas of the curriculum**, so ensuring spelling proficiency in specific vocabulary - from science to history to mathematics - is a responsibility shared by all teachers. This attention to the spelling of discipline-specific vocabulary not only enhances communicative clarity, but also reinforces understanding and consolidation of associated concepts, in line with approaches that integrate writing throughout learning (Hochman and Wexler, 2017; Quigley, 2022; Sedita, 2023).

At this point, the question arises: **should spelling mistakes be corrected?** In reality, the relevant question is how and when to do it. Correction is necessary and beneficial, but it should be done in an atmosphere of trust, where **the mistake is seen as a learning opportunity**. In any case, it should be approached in a formative and gradual way, in coherence with the linguistic and cognitive development of the pupils, and responding to the difficulties that certain pupils may present.

In the **first cycle of Primary Education**, the priority is to encourage written production as a means of expression and language development (Bigas et al., 2004); excessive or error-focused correction can demotivate and reduce the perception of self-efficacy and the willingness to take risks in writing (Cassany, 2000). This does not exclude pointing out errors previously worked on or those that make comprehension difficult, always with a didactic intention. In addition, it is essential that students understand the reason for the corrections and work on them, encouraging linguistic reflection through morphology, lexical families or the analysis of the semantic context.

From the second cycle of Primary Education onwards, expectations regarding spelling mastery increase and the consolidation of rules and precision becomes more important. At this stage, correction is applied more systematically and strategically. Research on teaching writing and effective feedback highlights

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that **intervening on drafts or intermediate versions is more formative than focusing solely on the final product** (Cassany, 2000; Ferris, 2010; Graham et al., 2015).

The logic is twofold: first, providing feedback during the process equates the teacher's intervention with the revision phase performed by the competent writer, making correction an integrated learning tool; second, when students receive feedback on a text that they still perceive as modifiable, they tend to show greater interest and receptiveness towards corrections and suggestions, as they perceive a real opportunity to improve (Graham et al., 2015), in line with the principles of formative assessment (Hattie, 2009; Nicol and Macfarlane-Dick, 2006), although learner response also depends on their individual characteristics (Bahr et al., 2025). Therefore, fostering a non-judgmental and autonomous correction environment is a key objective in primary school, as it encourages students to rewrite, to take an interest in corrections and to take advantage of them, thus learning strategies to revise and improve their texts independently.

As to whether the teacher should **mark the spelling error** (indirect correction) or provide the solution (direct correction), research indicates that there is no single optimal strategy; the choice depends on the type of error, the level of the learner, the purpose of the task and whether the learner has been taught to use **indirect correction** (Ellis, 2009; Ferris, 2013). Indirect correction can promote cognitive engagement, autonomy and deeper learning by inviting the learner to find the solution (Ferris, 2013), although it requires the learner to have the necessary skills. **Direct correction**, on the other hand, provides an immediate model, clarity and speed, and is particularly useful for errors in unfamiliar areas, irregular spelling or students with difficulties, and is more effective if accompanied by a brief explanation (Bitchener and Knoch, 2010).

In any case, whether the correction is direct or indirect, what is essential is that learners **actively work on errors**. This can be achieved through cooperative strategies, individual analysis and recording (e.g. classifying the error, identifying

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the rule broken, or recording the most recurrent errors in an 'error bank') combined with regular spaced practice activities (Dunlosky et al., 2013). The latter can include, in a planned way, the reinstatement of problematic words or rules in short dictations, 'word of the day' games or mini-review tests at increasing intervals (next day, three days, week...), ensuring that feedback translates into effective and lasting consolidation of orthographic knowledge.

Finally, **dictation**, traditionally used to teach and assess spelling in primary school, remains a valuable tool if used strategically. Research supports that improving writing and reading requires explicit and systematic spelling instruction, focused on teaching rules and accompanied by effective feedback (Graham, Harris and Santangelo, 2015; Moats, 2020). In this framework, dictation is useful when it is integrated to practise the rules worked on, analyse errors and diversify their application with more dynamic approaches (Cassany, 2004).

To this end, language teaching includes many variants that make it a more dynamic activity (Cicres and Llach, 2019), such as dictation in pairs - pupils dictate fragments to each other -, wall dictation - a "messenger" reads a text, memorises a fragment and dictates it to a "scribe", half dictation -which alternates dictated parts with free writing-, silent dictation -based on visual stimuli- or dictogloss, which consists of collaboratively reconstructing a text after listening to it at normal speed and taking key notes. Used in this way, dictation can become a tool not only for practice but also for diagnosis, allowing teachers to identify patterns of error and adjust their teaching strategies.

In conclusion, the ultimate purpose of teaching spelling is to **automate the application and correction of spelling conventions** so that learners can detect and correct errors effectively, thus freeing up cognitive resources for the more complex processes of written composition. This objective also includes encouraging the capacity for self-correction and autonomy in revision in order to promote linguistic reflection and the conscious use of rules. Table 2 summarises the main recommendations and approaches described:

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Table 2

Synthesis of key ideas in relation to the acquisition of orthographic awareness

Issue	Key idea
Explicit and systematic instruction	Teach rules, patterns, exceptions and arbitrary spelling in a graded and structured way from early stages.
Curriculum integration	Work on spelling not only in Language, but in all subject areas, ensuring mastery of subject-specific vocabulary.
Formative correction	Correcting in a climate of confidence, prioritising time and form, and intervening in drafts.
Methods of correction	Combining direct correction (correct model) and indirect correction (indication of the error), according to the type of error, the level of the pupil and the didactic objective.
Active work on errors	Recording, categorising and spaced practice of detected errors; use of error banks and regular review activities.
Variants of dictation	Use dictation as a diagnostic and practice tool with dynamic modalities.
Autonomy and self-correction	Teach strategies for students to revise and correct their texts independently, developing spelling awareness.

3. Composition strategies: writing to learn; writing to think.

Writing is not only transmitting ideas, as many think, but also a way of having them (Gregorio Luri, 2024).

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Writing is an act of thinking, not just transcription. In school, tasks such as narrating a day in ancient Rome, describing an experiment, or comparing pictorial, musical or literary genres help consolidate knowledge, exercise critical thinking and learn to communicate complex ideas in a structured way. However, many students perceive academic writing as a tacit, unattainable and mysterious code (Quigley, 2022), which becomes a barrier when its purposes, structures and conventions, linked to each discipline, are not explicitly taught.

Each curricular area has its own genres, purposes, vocabulary and grammatical patterns that students must master in order to think and communicate effectively: in Science, experimental reports and causal explanations with terms such as "hypothesis" or "variable"; in History, argumentative and narrative texts with temporal connectors and words such as "event", "cause" or "consequence"; in Mathematics, problems and demonstrations with expressions such as "solve", "prove" or "equation".

Following Hochman and Wexler (2017) in "The Writing Revolution", writing is conceived as a tool for thinking and learning **integrated into the curriculum**. This approach focuses on the sentence as the fundamental unit of thought, understands that the rigour of writing activities is set by the content itself, teaches grammar in the context of students' production, and prioritises textual planning and revision. Along these lines, Graham and Hebert (2010) have shown that **writing about what has been learned not only improves one's own writing, but also strengthens understanding of the content**.

This perspective implies that teaching writing is not simply about filling in pages, but about ordering thought, shaping knowledge and communicating it clearly and coherently. Therefore, **composition strategies should be closely linked to disciplinary content**, integrated into the classroom as an essential part of teaching at all stages, not as a parallel task or a decontextualised generic skill. Moreover, using writing as a thinking tool in all subjects helps teachers to identify

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gaps in students' understanding, offering a privileged window into learning and its obstacles.

This approach transforms **writing into an engine for deep understanding in all curriculum areas**, not just language (Graham and Hebert, 2010). To be inclusive and effective, it must begin at the earliest stages because, while students who have not yet mastered formal transcription cannot use writing to learn, they can and should develop from an early age the cognitive skills related to composition - planning, generating and organising ideas - through oral language. In this vein, research on emergent writing (Hall et al., 2015; Mathew et al., 2025; Puranik and Lonigan, 2014) supports this need, demonstrating the **efficacy of teaching these skills even before the mastery of letter tracing**.

This section deals with composition strategies, understanding that writing is not only a question of form or graphic correctness, but also - and above all - of what is written (content, which implies knowledge of the subject) and for what purpose. On the basis of these principles, first, the **sentence** is addressed as the basic unit of written thought for expressing clear and coherent ideas; second, the **paragraph** as a structure for organising and developing them; and third, the process of composing a **complete text**, understood as a strategic activity that requires conscious planning, writing, revising and editing. The strategies set out in the different tables are didactic proposals based on the research cited throughout the text, and the examples given to illustrate them have been drawn up by the authors themselves.

3.1. The sentence as the basic unit of written thought

The sentence is the fundamental unit of written thought, for it is in the sentence that ideas take concrete form and the first logical relationships are established. Mastering sentence construction is the first indispensable step in expressing complex thoughts coherently. Before aspiring to complete paragraphs or texts, students must be able to formulate grammatically correct

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and semantically clear sentences, not as a grammatical exercise, but in order to construct precise meaning.

Its pedagogical relevance is remarkable: explicit teaching at the sentence level improves not only writing, but also comprehension of the content being studied (Graham and Hebert, 2010; Graham et al., 2024). Moreover, more sophisticated syntax in writing enhances reading comprehension, as it facilitates understanding similar structures in the texts read (Scott, 2009). In fact, syntactic comprehension explains individual differences in reading comprehension (Nielsen et al., 2025).

By working on sentence structure, sentence combining (Saddler and Preschern, 2007) and sentence extension (Hochman and Wexler, 2017), students learn to identify main ideas, establish causal relationships, compare concepts and organise information logically. Thus, the sentence becomes a vehicle for thinking and an effective tool for learning. From this perspective, teaching how to write sentences is, in essence, teaching how to think clearly, deeply and rigorously.

Some examples of strategies for deepening knowledge through **sentence construction, extension and combination** are given in Table 3. For effective application, **it is essential that writing to think about what has been learned**, building on classroom content, and that the teacher provides explicit modelling, ensuring a gradual progression in difficulty and offering opportunities for practice that turn these tasks into functional tools for thinking, learning and communicating accurately in all subjects.

It should be added that this emphasis on **explicit sentence instruction is particularly effective for students with writing difficulties**, where direct and systematic instruction significantly improves text quality and syntactic knowledge (Chandler et al., 2021; Saddler and Graham, 2005; Saddler et al., 2008).

Table 3

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Strategies for developing sentence construction, combining and extending sentences from curriculum content.

<table>
<tr><th colspan="2">Expanding sentences: BBT (because, but, therefore).</th></tr>
<tr><td colspan="2">After establishing the main idea of the lesson content, students should extend it by using 'because' (cause/reason), 'but' (contrast/objection) or 'therefore' (consequence/conclusion). As they progress, equivalent conjunctions can be introduced (since, given that; however, nevertheless; consequently, therefore, so that...).</td></tr>
<tr><th>PRIMARY</th><th>SECONDARY</th></tr>
<tr><td>Prehistory
Main idea:
In Prehistory, early humans were nomadic.
(...) because they needed to move around to find food, such as animals to hunt or fruits to gather.
(...), but this began to change when some groups discovered agriculture and animal husbandry.
(...) therefore, they did not build permanent houses, but temporary shelters such as simple huts or lived in caves.</td><td>The forces
Main idea:
Forces can change the state of motion of a body or produce deformations in it. Examples:
..., because when a force is applied to an object, it can start to move, stop, change its speed or its trajectory.
..., but the final effect will depend on the magnitude and direction of the force, as well as the mass of the object and the presence of other forces such as friction.
..., therefore, to fully describe a force, it is necessary to specify not only its value, but also where it is applied and where it acts.</td></tr>
<tr><th colspan="2">Developing complex sentences from simple sentences</th></tr>
<tr><td colspan="2">From key words, short sentences (fragments) or schematic notes, all related to the contents worked on in class, students construct complete</td></tr>
</table>

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<table>
<tr><td colspan="2">sentences.</td></tr>
<tr><td>The circulatory system
Simple ideas worked on:
1. The heart is a very important organ.
2. The heart drives the blood.
3. Blood circulates through the blood vessels.
4. Blood carries nutrients throughout the body.
Combined sentence (student example):
The heart is a very important organ that drives the blood to circulate through the blood vessels carrying nutrients throughout the body.</td><td>Interpreting topographical maps
Simple ideas worked on:
1. Topographical maps show the altitude of the terrain.
2. They use lines called contour lines.
3. Each contour line joins points with the same altitude.
4. If the contour lines are very close together, the slope of the terrain is steep.
Combined sentence (student example):
Topographical maps show the altitude of the terrain by lines called contour lines, which join points with the same altitude, and indicate a steep slope if they are very close to each other.</td></tr>
<tr><td colspan="2">Developing sentences from notes (fragments/notes)</td></tr>
<tr><td colspan="2">Students combine notes in the form of fragments and simple annotations on the contents worked on to develop a sentence.</td></tr>
<tr><td>Density-floatability relationship
Notes/fragments of the class:
Water / wood / stone.
Wood: floats. Stone: sinks. Reason: density.</td><td>Powers of the State
Class notes/excerpts:
- Division of powers -> avoid abuse of power -> Balance and checks and balances between them.
- Legislative - Parliament: Makes laws.</td></tr>
</table>

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- Less dense than water -> floats. - Denser than water -> sinks. **Developed sentence (student example):** Wood floats on water because it is less dense, but stone sinks because it is denser than water.	- Executive - Government: Enforces laws. - Judicial - Judges/Courts: Judges compliance with laws + Resolves conflicts. **Developed sentence (student example):** The division of powers, legislative, executive and judicial, guarantees the balance and control of power by assigning specific functions: the Parliament creates laws, the Government applies them and the judges or courts judge their compliance and resolve conflicts, thus avoiding abuses of power.
Summary in a sentence	
This consists of identifying and selecting the most important key words in a written text or an oral explanation, and then organising them into a single sentence that summarises the main idea clearly and concisely, eliminating secondary details.	
Problem solving with addition and subtraction Synthesis of the process followed to solve a problem (providing connectors): To solve the problem, I first subtracted the seven balloons that popped, then added the nine he received	**Sports counselling** At the end of a physical education orientation session, summarise in a sentence the main ideas worked on: To orientate ourselves, first of all we must correctly place the plan according to the indications of the environment, then identify our position and, from there, establish the route to the next beacon.

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from his sister and finally subtracted the five he gave away to find out how many balloons he had left.	
Use of explanatory appositions	
Starting from a central idea drawn from the lesson content, students are guided to add clarifying or explanatory information through the use of an apposition.	
Art education materials Watercolours, **paints that are mixed with water**, are ideal for creating a landscape.	**The cell** Mitosis**, the process of cell division that produces identical cells,** is essential for tissue growth and repair.
Using key questions	
Students are taught to use key questions (What, Who, When, When, Where, Why, How) to add detailed and specific information to a basic idea or sentence about the content of the lesson.	
Great Deeds (adapted **Idea/Base Sentence**: Phileas Fogg went around the world in eighty days. **Who** was Phileas Fogg, **what** did he do, **how did** he travel? **Enriched sentence** (student example): Phileas Fogg, a very punctual and adventurous English gentleman, gambled that he could go around the	**The Treaty of Versailles** **Idea/ Base Sentence**: The Treaty of Versailles had great consequences. **What** was it, **who** signed it, **when** was it signed, where? - **When** was it signed, **where**, **why did** it have great consequences, how did it affect Germany? **Enriched Sentence** (student example): The Treaty of Versailles, signed in 1919 in France by the Allied powers and

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world in just 80 days, and to achieve this he travelled using many different means of transport such as boats, trains and even an elephant.	Germany to end the First World War, had great consequences, as it imposed harsh conditions on Germany, leading to a deep economic crisis and strong resentment that contributed to future conflicts.
Variation of predicates	
Based on a central theme linked to the content of the lesson (such as an artistic movement, a scientific concept or a historical period), students are asked to develop several sentences, varying the predicate in each (providing verbs if appropriate).	
The orchestra Possible verbs: to be, to have and to need. An orchestra is a very large group of musicians playing together. An orchestra has many different instruments such as violins, flutes and drums. An orchestra needs someone to conduct so that all the musicians play at the same time.	**Impressionism** Impressionism was a painting movement that emerged in France in the late 19th century. Impressionism counted among its main representatives artists such as Monet, Renoir, Degas and Pissarro". Impressionism revolutionised painting by breaking with the traditional principles of academicism.

It is important to stress that most of these strategies can be applied from early childhood education through oral language, as in the rest of the educational

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levels, since **the difficulty does not lie in the strategy itself, but in the complexity of the content to be addressed and in the degree of teaching support.**

3.2. The paragraph as a tool for organising ideas

Good paragraphs can hardly be written without a certain mastery of the sentence. However, the paragraph is not a simple container of sentences. Although it may seem a simple element of writing, learning to construct it involves much more than knowing grammatical or stylistic rules. In essence, a paragraph is a set of cohesive sentences that develop a single central idea, usually expressed in the **topic sentence**, while subsequent sentences expand, explain, exemplify, exemplify, detail or qualify it. This fundamental structure provides a mental framework for organising thought and establishing logical relationships between ideas, as pointed out by Lopez (2024), who describes the paragraph as an essential unit for textual cohesion and coherence.

When learners do not receive specific instruction in paragraph construction, their texts often become a catch-all of unconnected ideas. As anticipated by Flower and Hayes (1981), the absence of explicit instruction can lead to confusion between the simple accumulation of ideas and a logical organisation of the text. **Teaching paragraph construction** is therefore essential for clarity, cohesion and communicative efficiency, and **is one of the most effective practices** for improving text quality (Graham and Perin, 2007), especially for students with learning difficulties (Gillespie and Graham, 2014).

However, the ability to write coherent paragraphs is closely linked to a **thorough understanding of the content**. Far from being a mechanical skill, it involves identifying the main idea, distinguishing it from details and organising information logically. For this reason, when a student has difficulties in constructing an effective paragraph, the problem does not necessarily lie in their writing competence, but in an insufficient understanding of the subject matter. In

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this sense, the bidirectional relationship between reading comprehension and written production has been widely documented both by cognitive psychology (Fitzgerald and Shanahan, 2000) and didactics (Graham and Hebert, 2011; Tynjälä et al., 2001), and is even confirmed in disciplines such as mathematics (Martin, 2015).

Consequently, explicit and practical teaching of strategies for identifying and organising ideas not only improves the quality of texts, but is one of the most effective interventions for fostering deeper understanding of curricular content (Boscolo and Mason, 2001; Graham, 2018; Hochman and Wexler, 2017; Knipper and Duggan, 2006; Parr et al., 2021; Quigley, 2022). Its effectiveness lies in conceiving of the paragraph as a **micro-essay**: a unit that is brief enough to be used daily without being overwhelming, but which requires sophisticated organisation of thought by requiring the selection of a central idea and its development through specific details.

For these reasons, teaching how to construct well-organised paragraphs should not be understood as a task isolated from the teaching of content. On the contrary, it is a pedagogical strategy that helps to **understand, clarify, hierarchise and communicate knowledge in** a meaningful way. Moreover, it favours metacognitive processes (Graham and Harris, 2000), as it forces the student to plan what to write, how to develop the idea and how to close the argument, actively reflecting on what has been learnt.

Finally, the following table presents examples of proposals for using the paragraph as a micro-essay with real curriculum content. The structure of the examples is always the same: a topic sentence that answers a question or problem, followed by two or three supporting ideas that prove, explain, qualify or exemplify it, and a closing sentence that synthesises the argument.

Table 4

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Examples of the use of the paragraph as a micro-essay to work on curriculum content

Content	**Question**	**Example of student paragraph**
Primary **Literature**	Why do you think Charlie was the fair winner of the chocolate factory?	Charlie deserved to win the factory because he was a good and generous child, unlike the others. For example, he shared the money he found with his family instead of spending it all for himself. He was also the only honest child who obeyed Mr. Wonka's rules. His good heart, not luck, made him the perfect winner.
Primary **The water cycle and its stages**	Why is evaporation important in the water cycle?	Evaporation is important because it allows water from rivers, seas and lakes to rise to the sky as vapour. Without this step, clouds would not form and it would not rain. It is therefore essential for the proper functioning of the water cycle.
Primary **Prehistory**	What was the most important change that occurred in the transition from the	The most important change in prehistory was the shift from nomadic to sedentary life. During the Palaeolithic, humans were nomadic, constantly moving around to hunt and gather. However, in the Neolithic, the invention of agriculture and animal husbandry allowed them to produce their own food and live in fixed villages. This change transformed their way of life forever.

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	Palaeolithic to the Neolithic and why?	
Secondary **Pythagorean Theorem**	How is the Pythagorean Theorem used to calculate the length of an unknown side in a right triangle?	The Pythagorean Theorem is a relationship that applies only to right triangles. The theorem states that the sum of the square of the legs (a and b) is always equal to the square of the hypotenuse (c). To use it, we first substitute the values of the two sides we know into the equation. Then, we calculate the powers and clear the unknown to find its value. In this way, this theorem allows us to find the length of an unknown side without having to measure it directly.
Secondary **Cubism**	What makes Cubism unique compared to previous styles?	Cubism is an artistic movement that broke with the tradition of representing reality from a single point of view. Unlike previous styles that sought a single perspective, Cubist artists show objects from several angles at the same time, breaking down form. This is seen in works by Picasso, where faces seem to be disassembled and rearranged to offer a more complete view of reality. Therefore, his originality does not lie in what he paints, but in his revolutionary way of observing and capturing the world.

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3.3. The complete text as a strategic act

Writing is much more than writing a final product: we plan to organise ideas, we draft to turn them into discourse, and we revise to refine them, prompting critical reflection. Explicitly teaching each phase not only improves the quality of texts, but also makes writing a powerful tool for thinking and learning across the curriculum (Bereiter and Scardamalia, 2013; Graham et al., 2019, 2024; Troia et al., 2014). Without direct instruction on how to plan, write and revise, many students simply 'tell what they know', often resulting in messy writing with little depth and weak argumentation.

In line with this approach, **writing is not only about demonstrating knowledge, but also about acquiring knowledge, reformulating ideas and deepening what has been learned** (Boscolo and Mason, 2001; Carter et al., 2007; Klein et al., 2016; Newell, 2006). Logically**, the more you know about a topic, the better you can write about it**, as prior knowledge directly influences the conceptual depth, argumentative quality and coherence of the text (McCutchen, 2011). Hence the importance of writing as a means for deep learning.

However, for writing to unfold its potential as a learning tool, the teacher must decide, before proposing a full-text assignment, on aspects such as the **type of text** (narrative, expository or argumentative), the **purpose** and the **audience**, always **in relation to the learning objectives** (Sedita, 2023). Thus, a unit on Prehistory in the fifth year of the Primary education could culminate in a description of a fictional day of a Palaeolithic child, while a study of World War II in the final year of the Secondary could be followed by an opinion piece on the current role of the UN. Other examples of full-text writing tasks could be: a critical analysis of an advertisement for fat-burning ointments following a unit on physical activity and health in Physical Education in the final year of the Secondary education; an expository text in which sixth year of the Primary

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education pupils compare life in the Middle Ages and today; or a piece of writing in second year of the Secondary explaining the consequences of excessive screen use on sleep using graphs and statistical concepts studied in mathematics.

Defining the writing task precisely involves specifying tasks, format and length. Whenever relevant, it is useful to design a communicative scenario, since knowing ***for what* (purpose)** and ***for whom* (audience) one is writing** improves the relevance and coherence of texts **(**Graham and Perin, 2007). However, it is important to stress here that **while every act of writing has a purpose, not every audience is external**. In this respect, **writing does not always fulfil a communicative function**. It also has didactic or epistemic functions, such as thinking, organising ideas or solving problems (Britton et al., 1975; Flower and Hayes, 1981; Klein, 2000), as well as expressive or aesthetic functions that enrich linguistic learning and are fundamental in school.

Once the task has been designed, it is essential to plan the **supports** to be offered at each stage of the process: from reading model texts to the use of graphic organisers, sentence starter templates, vocabulary banks and connectors. Similarly, it is useful to plan how revision will be carried out, combining teacher correction, self-revision and peer review. The following sections deal more specifically with each of the stages - planning, writing and revising - with practical suggestions for implementation in the classroom.

3.3.1. Planning: what am I going to write about and how will I organise it?

Planning is the initial phase of the writing process, defining the purpose, anticipating the overall structure and selecting relevant content. Expert writers adjust their planning flexibly while writing - a skill that involves high levels of automaticity and in-depth knowledge of the subject matter - but most learners need to acquire it through explicit instruction, which has been shown to improve the quality of texts (Graham et al., 2012, 2016 and 2022; Troia et al., 2014).

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Often, students spend little time at this stage and their outlines often consist of initial drafts with complete sentences, rather than a visual organisation of their approaches. It is therefore essential to **teach strategies that help to generate, group and prioritise information**, as well as to anticipate the structure of the text (Flower & Hayes, 1981; Graham & Harris, 2005). Activities such as activating prior knowledge, brainstorming and organising ideas by means of schemes or categories allow for building stronger knowledge connections that help to write higher quality texts (Graham et al., 2023; Sicat, 2022). Undoubtedly, this aspect is especially relevant when the teacher's aim is for students to deepen their knowledge of the subject matter covered in class, whether it is energy and its properties, sources and uses, or the main artistic and literary movements in the 16th century.

Among the most effective resources are **graphic organisers** (visual maps, hierarchical diagrams, concept maps, guiding questions), which facilitate the external representation of thought. These resources should **make visible the *tacit knowledge* of an expert writer**, showing explicitly how they organise their thoughts before writing. Teacher modelling of metacognitive strategies - such as thinking aloud, verbalising decisions, analysing models and describing the planning process - has been shown to have a positive impact on the development of writing autonomy (López et al., 2017).

Similarly, explicitly teaching the typical structure of different **text typologies** - narrative, expository, argumentative - has been shown to be an effective practice in facilitating both planning and writing (Graham et al., 2012; Strong, 2020). But beyond identifying the dominant typology of a text, it is essential to show the internal **organisational** structures that shape the content - such as description, temporal sequence, cause-effect relationship, comparison and contrast, problem-solution structure or concept definition - as systematised by Meyer (1975). In fact, explicit instruction in these patterns favours both reading comprehension and written production (Hebert et al., 2016; Pyle et al., 2017).

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Therefore, familiarising learners with these structures helps them to anticipate the development of content, establish logical relationships between ideas and organise their discourse more coherently; this effect can be reinforced by providing connector guides adapted not only to each organisational pattern, but also to the idiosyncrasies of knowledge specific to each discipline.

3.3.2. Writing: from ideas to text

Writing is not about transcribing ideas, but about transforming a plan into a written discourse that articulates content, structure and style. Skilled writers simultaneously control what they have written, what they write and what they plan to write, adjusting to the type of text and audience (Berninger and Winn, 2006; Hayes, 2000), making writing a complex and strategic cognitive activity.

When students have solid subject knowledge, their texts are more accurate, in-depth and well-organised (McCutchen, 2011), which reinforces the importance of integrating writing into the learning of curricular content (Graham and Perin, 2007; Shanahan, 2016). **Writing about what is learned not only expresses knowledge, but also reorganises it, deepens it and makes meaningful connections.** For this reason, the phase of writing a complete text (an article, a short essay, a news item...) makes full sense when students have assimilated the contents, as writing then becomes a means of elaborating knowledge.

At this stage, the aim is to convert the outline of ideas into a coherent text. The writing of a **first draft** fulfils a fundamental strategic function: it **allows the generation of ideas to be separated from linguistic correction**, avoiding interruptions in the flow of thought. If the learner cannot find the precise word, they can write an approximation and mark it for later revision; if they doubt the spelling, they can underline it and continue, as **postponing revision has been shown to favour deeper and more meaningful corrections** (Graham and Harris, 2016). This separation reduces cognitive load and allows mental resources to be

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focused on the organisation and exposition of ideas (Kellogg, 2008; Olive, 2014), improving fluency and quality. The draft is thus a thinking tool, not a final product.

When the student has mastered the construction of complex sentences, writing becomes an exercise in discursive assembly, applying previously worked skills: combining ideas with connectors ("because", "but", "therefore"), enriching sentences with appositions or structuring paragraphs around a central idea.

Research confirms that explicit teaching of strategies, modelling of writing thinking, guided practice and reflection on one's own text significantly improve the quality of written production (Graham et al., 2016; Troia et al., 2014). Table 5 summarises the most effective teaching strategies for this phase, according to the available evidence.

Table 5

Effective strategies to support writing in the writing composition process

Strategy	Purpose	Instructional application
Drafting without interruptions	Encourage the flow of ideas without technical distractions, separating content generation from linguistic correction.	Writing without stopping for spelling or grammatical doubts; underlining doubtful words or marking with "??" to check later (for spelling correction, to look for synonyms, etc.).
Strategic pause to reread the plan	Ensure that the aim of the text is followed.	Pause briefly to review the outline and check that it stays on track.

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Modelling the writing process	Visualise the expert writer's thinking.	Writing aloud (teacher), explaining choice of structures, vocabulary and connections between ideas.
Use of mnemonic acronyms.	Facilitate memorisation of steps and encourage self-regulation.	Examples: *3-2-1* (three ideas learned, two to explore, one question) or *TAC* (thesis, arguments, counterargument, conclusion).
Strategic self-instructions	Encourage self-control during writing.	Teach self-regulation phrases such as "I will focus on this idea" or "I can go on and come back later". Use of support cards or visible reminders.
Progression based on mastery	Ensure consolidation of each strategy before introducing new ones.	Do not move on to longer texts if the paragraph is not mastered or, for example, in the acronym TAC, do not move on to the counter-argument until the thesis and arguments are clearly handled.
Use of model texts	Understand and emulate well-written texts.	Compare texts of different quality; identify structures and connectors; perform imitative writing.
Segment writing	Reduce cognitive load.	Write a particular section first, revise it and assemble the parts later; useful for learners with difficulties.
Instruction in text structure	Improve coherence and cohesion.	Explicitly teach the structure of the paragraph and of each textual typology through visual organisers.
Text-	Focus	Set clear goals, such as "include

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specific goals	attention on features of the final text.	a thesis, three reasons and a rebuttal", linked to checklists.

3.3.3. Revision: rethinking the text to improve it

Revising a text goes far beyond correcting spelling or punctuation errors. It involves adopting a critical stance towards what has been written, with the aim of improving the clarity, coherence and communicative effectiveness of the message. It involves distancing, careful re-reading and the ability to ask oneself whether the text is understood, makes sense and fulfils its purpose. In this sense, to **revise is to rethink what has been thought and to rewrite is a way of refining one's thinking**.

In basic education, teaching revision should not only have a technical purpose, but also a **formative** and **ethical** one, promoting critical thinking and the development of values such as **responsibility** and **self-demand**. Re-reading with the intention to improve demonstrates a commitment to *want to do things well*, not only with oneself, but also with others by offering a careful and respectful work to the reader. As proofreading is not an innate habit, Torkildsen (2016) found that it was mainly students with higher reading and spelling skills who did it spontaneously, which had a direct impact on the quality of their texts. Hence the importance of explicit teaching of revision, enabling all students - and not only the more advanced ones - to develop this ability and benefit from its educational potential.

Revision improves textual quality (Fitzgerald and Markham, 1987; Graham et al., 2012, 2019), although its effectiveness in the school context depends largely on how it is taught. The effects are greater when it is not addressed in isolation for students to "correct", but **is integrated into the overall composition process**, revision strategies are taught, the process is modelled and collaborative practices

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such as peer review are incorporated (Graham et al., 2012, 2019; Koster et al., 2015; Schnee, 2010), following the principles of **explicit teaching** (Rosenshine, 2012). From this approach, for these peer interactions to be effective, their design is fundamental: they should have clear criteria involving students in their development, provide training on constructive feedback and guide the activity, for example, with checklists (Topping, 2017).

In this framework, dedicating classroom time to **writing discussions** - in which students discuss their texts, explain their choices, receive suggestions and reflect on the clarity and coherence of ideas - reinforces revision as an intellectual habit and improves both writing and **understanding of content** (Graham and Perin, 2007). This approach is particularly effective because, at a cognitive level, **talking about what is written acts as a recall practice**: the effort to retrieve and explain information consolidates learning, strengthening memory and understanding in a more lasting way (Karpicke and Blunt, 2011). Thus, when writing is used as a tool for learning disciplinary content, revising also involves examining the knowledge worked on: correcting an argumentative text in Science or reformulating an essay in History forces one to go back over what has been learnt, consolidating, reorganising and deepening its understanding. Moreover, this process allows the teacher to detect conceptual errors or gaps in knowledge and to adjust teaching to the curricular objectives.

Table 6 presents strategies with evidence of positive impact on revision, together with key issues for implementation and practical classroom examples.

Table 6

Strategies with evidence for teaching revision of texts

Setting clear revision objectives
KEY IDEAS: - Replace the generic "revise your text" with specific goals

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supported by checklists.

- Teach the use of these checklists through modelling, practice with examples and co-creation and/or discussion of criteria (it is not enough to give a list of things to check, you have to teach how to use it).

- Focus first on content and structure (the substance) and then on grammar and spelling (the form) to reduce the cognitive load.

EXAMPLE: In History, after writing a news item on the Industrial Revolution:

1. **First stage**: check content (*does it focus on a real event?*), vocabulary (*is it accurate and appropriate to the historical context?*) and structure (*does each paragraph develop a specific idea?*).
2. **Second stage**: check grammar and spelling (*clarity of sentences, concordance, punctuation, spelling*).

Peer review (with specific instruction and guidance).

KEY IDEAS:

- Guide revision with clear criteria (checklists are useful) previously taught and practised.

- Giving feedback is often more beneficial than receiving it, because it forces the student to apply quality criteria and internalise them.

- Teacher modelling is essential if practice is to be mindful, respectful and useful, rather than a superficial routine.

EXAMPLE: In Art and Visual Education, students review a comparative text between "La Gioconda" (Leonardo da Vinci) and the "Portrait of Adele Bloch-Bauer" (Gustav Klimt):

1. Silent reading of partner text.
2. Cross-checking with a checklist modelled by the

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teacher.

3. Constructive feedback: two positive aspects and one suggestion for improvement.

4. Rewriting based on the comments received.

Teaching self-regulation strategies for revision.

KEY IDEAS:

- Teach and practice clear review sequences (self-instructions or acronyms) to reduce cognitive load.

- Make revision a conscious and manageable process (from the global to the concrete).

- Modelling and repeated practice consolidate learner autonomy at this stage.

EXAMPLE: Application of the acronym **R.E.C.I.R.R.** to texts in different curricular areas:

- R: Reread with a general objective (*Is the idea you wanted to convey understood?*).

- E: Evaluate the main idea (*Could I underline it? Would a reader who knows nothing about the subject understand what I mean?*).

- C: Check the organisation and coherence between paragraphs (*Does each paragraph develop an idea? Are the paragraphs in a logical order?*).

- I: Incorporate content improvements (*Can I add more details, examples or data to make my ideas more convincing? Are there any confusing parts?*).

- R: Remove or replace vague expressions (*Are there repetitive words or phrases that I could remove or change? Have I used vague words ("thing", "something", "well") that I could replace with more precise ones?*)

- R: Refine spelling and punctuation (*Have I checked spelling?*

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Have I read the text aloud for poor sounding phrases or punctuation errors?)
Encourage reflection on the revision process.
KEY IDEAS: - Encouraging students to think about *how they* revise and what decisions they make when improving their texts and fosters writing autonomy by making revision a deliberate rather than automatic practice.
EXAMPLE: In Language Arts, after revising a narrative text commentary, students respond to a brief meta-reflection guide: - *What changes did I make to improve the coherence of the story?* - *What part of the text was most difficult to revise and why?* - *What did I learn about my writing from this revision?*

Although in this section we have focused on revision as part of the composition process, it is also necessary to ask **what strategies for teacher correction are most effective.** In this respect, "Informing Writing: The Benefits of Formative Assessment" (Graham, Harris and Hebert, 2011) shows that feedback is most effective when it is applied in a **selective and focused** way, challenging the usual practice of extensive corrections and marginal annotations. In this respect, it is more beneficial to **intervene while the text is in progress**, accompanying the revision phase, rather than simply pointing out errors in the final product. However, the quality of individualised attention depends to a large extent on the ratio and the availability of support teachers. This does not, of course, exclude summative evaluation when it comes to assessing the achievement of learning objectives.

However, what is decisive is not only what the teacher corrects, but **what the learner does with this information**. For the correction to have an impact, it

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must be followed by a **conscious learning action**: reorganising a paragraph to improve its coherence, restating a confused scientific hypothesis, reformulating an inaccurate historical interpretation, clarifying a poorly justified philosophical argument, or restructuring a mathematical explanation with logical leaps. In all these cases, writing becomes a tool for clarifying and refining thinking about content. Without this active response from the learner, correction is reduced to a one-way gesture with little effect on deep learning. According to Morales and Fernández (2022, p. 49), "formative assessment has to take more time for the learner than for the teacher".

In other words, teacher correction is essential, but its effectiveness lies less in the enumeration of errors and more in the ability to **generate reflection and dialogue** about them. In fact, the report highlights that **oral comments** - individually or in small groups - can be more effective than written annotations, as they clarify doubts, set realistic goals and reinforce understanding of textual and disciplinary quality criteria, while easing the burden of written correction for the teacher.

Finally, when the learner has reflected on their own draft, they come to the external revision with a greater willingness to accept suggestions from the teacher or peers. This prior self-evaluation enhances **receptiveness to comments and corrections** (Andrade and Valtcheva, 2009) and is key for the revision to be perceived as an opportunity for improvement. In this way, it fosters **a climate of dialogue** and shared learning around writing and disciplinary content that not only improves the quality of texts, but also develops metacognitive skills and a greater understanding of quality criteria (Cho and MacArthur, 2010). Ultimately, this approach transforms writing into a social and collaborative practice that enhances both linguistic and disciplinary learning.

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4. "I know how to do it and I know I can do it": self-regulation and self-efficacy for writing and learning

> *The higher the perceived self-efficacy, the more active the efforts. People with high confidence in their abilities approach difficult tasks as challenges to be overcome, rather than as threats to be avoided* (Albert Bandura, 1986).

How do we get a student not only to write more, but to write better and, crucially, to feel capable of doing so? The research is conclusive: the key is to ensure that the learner acquires the knowledge, tools and confidence to become more autonomous and independent in the act of writing. According to the recent meta-analysis by Graham et al. (2025), teaching writing strategies and setting clear goals not only improves the quality of texts, but also significantly strengthens students' perceived self-efficacy as writers. In short, **when students learn how to plan, draft, revise and regulate their own writing process, they also strengthen the belief that they can write well**, consistent with Bandura's social cognitive theory, which postulated that the most potent source of self-efficacy is "mastery experiences" (Bandura, 1977). That is, there is no better motivation for doing something than feeling empowered to do it.

However, as has been argued throughout the article, strategies alone are not enough. To write well, students also need **knowledge of the content** they are writing about, since it is conceptual mastery of the subject matter that enables them to develop ideas, argue clearly and construct more coherent and complex texts (Graham and Perin, 2007). Therefore, the combination of **knowing *what to* write** (knowledge) and **knowing *how to* write it** (strategy) creates a spiral of continuous improvement: as the student understands better what to write and how to write it, their perceived self-efficacy increases, which in turn motivates them to continue writing and learning. In other words, feeling capable of writing well is not only a result of writing more and better, but also a precondition for daring to do so.

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Self-regulation is fostered by teaching students to plan, monitor and correct their written production, moving from "the teacher corrects me" to "I can revise and improve my work". To this end, teaching should follow explicit modelling by the teacher, based on the **gradual release of responsibility** (Fisher and Frey, 2013), moving from "I do it" (the teacher models the strategy), to "We do it together" (guided practice with the whole group), to "You do it, with me" (collaborative practice in pairs or small groups, with timely help and feedback), to "You do it alone" (autonomous student practice).

Table 7 shows actions to enhance self-regulation in learning **transcription** skills (handwriting fluency and spelling awareness).

Table 7

Examples of actions to promote self-regulation in learning transcription skills

	Self-regulation strategy	**What does it consist of?**	**Concrete example of application**
Handwriting fluency	Self-assessment with visual models	Systematically compare own letter with a correct visual model.	The student looks at their letter "p" and asks themselves, "Is the stick of my 'p' straight?" or "Did I close the belly of the letter properly?"
	Verbal movement guides	Use short, motor-directed phrases to accompany the correct tracing of letters.	The student says quietly: *"Round to the left, down under, up and close the loop"* while writing the "g".

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	Error Analysis and Micro-graphomotor Goals	Compare with models to identify an area for improvement and set a goal.	When comparing with the model, the student notices that his "a's" are open and sets a goal: "Today I am going to close the top properly".
Spelling awareness	Use of metacognitive strategies	Follow a routine for word study that includes a final self-assessment.	The pupil uses the routine "Look-Say-Tap-Write-Check" with the word "light bulb".
	Promoting spelling awareness	Actively monitor spelling choices while writing.	Student writes "Two cars" and pauses: "Are 'two' and 'too' spelled the same? I should look it up".
	Self-correction routines with tools	Check the text with available support resources before handing it in.	Student circles doubtful words with a different colour and looks them up in the dictionary or word bank.
	Spelling error diaries	Record frequent errors and reflect on them to avoid repetition.	The pupil notes that they usually spell "because" as "becase", writes the rule and checks if they keep on making mistakes.

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As we have argued, beyond transcribing correctly, students must learn **composition strategies**, which include planning, drafting and revising strategically. Approaches focused on teaching self-regulated strategies such as **SRSD (Self-Regulated Strategy Development)**, proposed by Harris and Graham (1996), which integrates explicit instruction on text structure, vocabulary and self-regulation strategies, have shown high efficacy in improving writing quality, especially in students with learning difficulties (Cuenca-Carlino, 2017; Festas et al., 2015; Graham et al., 2014; Harris, 2024; Kim et al., 2021; Koster et al., 2015).

The key to the success of a model such as SRSD lies in understanding that **the teaching of writing strategies is inseparable from the acquisition of knowledge**. No technique can compensate for a deficit of knowledge about the topic being written about. Greater knowledge enables writing strategies to be applied more effectively and, in turn, mastery of these strategies facilitates the organisation and understanding of new content, creating a cycle in which knowledge and strategy feed back into each other.

The **SRSD** model is developed through **six stages of explicit instruction and modelling** (Harris, 2024): *activating prior knowledge, discussing the strategy, modelling it, memorising it, supporting practice, and promoting independent practice and generalisation*. To show how these phases are realised in the classroom, Table 8 exemplifies them in the writing of an expository-argumentative text of musical analysis in the third year of the Secondary Education based on the question: "How does John Williams use the leitmotif to represent Darth Vader in Star Wars?". The automation of this strategy not only facilitates the application of the knowledge acquired, but also reduces the cognitive load, allowing the student to concentrate on the depth of the analysis, the connection between ideas and the richness of the language used to express them.

Table 8

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Application of the SRSD model with the M.S.T.R.I.C.H. strategy in writing music analyses (3rd year of the Secondary Education)

Stages of the SRSD Model of learning self-regulated writing strategies	**How does composer John Williams use the leitmotif to represent the character of Darth Vader in "Star Wars"?** **Strategy:** M.S.T.R.I.C.H. **Audience:** Readers of a cultural supplement or an educational blog column (simulated).
1. ACTIVATE/PROVIDE BACKGROUND KNOWLEDGE Secure basic musical vocabulary and concepts (you can't write about what you don't know).	Watch the shark scene in "Jaws" with and without sound and discuss how the musical motif creates tension; listen to "Indiana Jones" and discuss why it sounds heroic: *What sensations does the music add that were not there before? What role does the soundtrack play here?* Review the seven elements of **M.S.T.R.I.C.H.** with brief aural examples: **M**elody, **S**tructure, **T**exture, **R**hythm, **I**nstrumentation, **C**haracter and **H**armony**.**
2. DISCUSS STRATEGY Present the strategy as a tool for thinking and organising ideas, seeking the student's understanding of its value.	Using the "Indiana Jones" theme as an example, compare a poor text ("sounds like adventure") as a counterexample with a rich text ("marching rhythm and rising brass melody convey heroism"). Recall the structure of the expository text (introduction, development with M.S.T.R.I.C.H., conclusion).
3. MODELLING THE STRATEGY	Analyse "Jurassic Park" live by integrating the elements of M.S.T.R.I.C.H., connecting ideas,

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Teacher writes as "expert" and thinks aloud to show the process ("I do it").	revising phrases to improve clarity and accuracy and verbalising the process: "*First I think of the **M**elody... now I look for the **I**nstrumentation that plays it... I will connect this to the **C**haracter it produces...*"; "*this phrase sounds better like this...*".
4. MEMORISE THE STRATEGY Automate the steps to free up working memory and reduce cognitive load.	Short, playful, repetition activities are used to make students internalise **M.S.T.R.I.C.H.** until their recall is instantaneous: memorisation games, rhythmic chants, or cue cards; poster with M.S.T.R.I.C.H. in the classroom.
5. SUPPORT PRACTICE "We do it together": collaborative practice with teacher and peer support.	Small group analysis of Darth Vader theme with graphic organiser; writing in pairs with guided feedback (questions, connectors, word banks, checklist).
6. INDEPENDENT PRACTICE AND GENERALISATION "You do it alone": gradual withdrawal of support until autonomy is achieved.	The learner writes autonomously and independently the analysis of the leitmotif of Darth Vader, relying only on a self-revision checklist. *Generalisation:* M.S.T.R.I.C.H. is applied to new tasks, such as analysing the music of a video game or a work of another musical genre.

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Finally, in the case of **students with learning difficulties**, scientific evidence indicates that a generalist approach to teaching writing is insufficient. These students require **more intensive, structured interventions tailored to their specific needs**. Kokkali and Antoniou's (2024) meta-analysis confirms that the most effective interventions explicitly and systematically teach the key processes of writing - planning, drafting and revision - along with the necessary knowledge, and incorporate self-regulation strategies such as SRSD (Santangelo et al., 2007). This type of instruction has been shown to have a significant positive impact on text quality, even in students with language impairment (Puranik and Koutsoftas, 2024), and is most effective in small groups.

Ultimately, **quality teaching - explicit, systematic, progressive and maximally autonomy-oriented - ensures learning for all students.** For learners with difficulties, the key is not to change teaching principles, but to apply them with greater intensity, frequency and precision. Responding to diversity depends on "how", "how much" and with what level of adjustment we provide help, rather than on "what" we teach.

5. Using generative artificial intelligence for learning to write: still more questions than answers

> *The power of writing lies in its use as a tool for thinking* (Steve Graham, 2024).

In an article devoted to the teaching of writing, the emergence of artificial intelligence (AI) cannot be ignored. For the skilled writer, it is undoubtedly a valuable tool for speeding up processes, overcoming blockages, obtaining style suggestions, exploring new ideas, structuring complex texts, revising and improving them. But **what should it be used for in basic education?** If AI can replace the student in the composition process, to what extent is the teaching of writing relevant? If writing is a means to think, how can we prevent students from delegating to AI the cognitive effort needed to learn? Conversely, can its potential

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be harnessed to enrich reflection and textual production? When can it be a help and when can it be a hindrance to learning?

These questions do not have simple answers and research is still in its infancy. Moreover, as Weidlich et al. (2025), much of the current research on ChatGPT - one of the most popular generative AIs - in education has major problems: **it is often assumed that the model is itself a pedagogical intervention, when in fact it is only a tool**; there are many hasty studies with weak methodologies that do not clarify what it means to use ChatGPT, what the control groups do or how learning is actually measured; and, in general, a "*fast science*" logic prevails that produces results that are appealing on the surface but difficult to interpret and replicate.

Against this background, the authors call for sound research questions to understand under what conditions and for what purposes it may make sense to integrate AI into teaching and learning. This call for caution is especially relevant in the field of education, where, as Salmerón-Ruiz et al. (2024) recall in the context of the general use of screens, the speed of technological innovation far exceeds the slow pace of rigorous science, so **the absence of evidence of risk should not be interpreted as evidence of its absence.**

Taking up this invitation, the accumulated evidence on learning to write allows for some reflections and research questions. To this end, I will not focus on the many and varied uses that teachers can make of AI to generate resources and activities - Crespo Ramos (2025) and, specifically on writing, Sedita (2025) can be consulted in this regard - but on **the use of AI by the student who is learning to write** in basic education. In this context, the analogy of the Writing Bicycle - developed in this article as a metaphor for understanding and planning its teaching - can be useful for thinking about the uses (and limits) of AI in this field.

Let us start with the front wheel, corresponding to **transcription skills**, whose automation, as I have argued, has been shown to be essential for freeing

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up working memory resources and allowing attention to be focused on planning, composing ideas, organising the text and revising it.

Calligraphic fluency - the first component - is a neuromotor process that can only be acquired through direct, manual practice, hardly replaceable by technology. Here, AI plays a very limited role, as **the motor and cognitive training required to write manually cannot be replaced.** However, while AI cannot automate handwriting (as only the writer can do it), it can offer complementary supports, especially in developing typing and improving accessibility for students with specific written language learning difficulties, according to the evidence on existing assistive technology (Alanazi and Abdulkader, 2024; Rahim et al., 2025). It is in this area that AI can extend emerging research in areas such as the design of adaptive feedback systems that accelerate typing fluency and provide more effective responses to specific difficulties, as well as in the development of more effective detection and support tools for students with, for example, dysgraphia.

Let us turn now to **spelling awareness**, understood as the ability to recognise, understand and apply spelling rules appropriately - the second component of transcription skills. Evidence on the use of proofreaders suggests that when learners put more effort into locating and correcting their own errors, they consolidate learning better, whereas overly automated help may attenuate this effect (Lin et al., 2017). It can be assumed at this point that **an over-reliance on AI in the spelling learning process might inhibit reflection on rules and self-correction**, as the cognitive effort required for memorisation and application is externalised. In fact, a recent study with first graders has provided direct evidence of this phenomenon: the group writing on tablets with a text-to-speech system - which acts as an immediate corrector - maintained a high level of spelling correctness, but, unlike the group writing by hand, showed no improvement in this skill over the course of a school year (Spilling et al., 2023).

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In the same vein, L'Ecuyer (2019) argues that technology is never neutral in childhood, as it can displace essential experiences for cognitive development if it replaces, rather than enriches, formative processes. From this perspective, **any AI support for spelling learning should be designed in a way that prevents students from giving up reflecting on their mistakes** and relying fully on automatic correction. The challenge, ultimately, is to ensure that AI does not replace the metacognitive process, but rather enhances it, ensuring that cognitive delegation to the tool does not override learning.

Precisely at this point, artificial intelligence (AI) can be a tool for personalised practice and explanation. For this, instead of applying automatic corrections or offering immediate solutions, it should guide the learner in identifying their own mistakes through reflective questions, hints, examples or analysis exercises that favour their understanding. This approach, based on **formative feedback**, requires careful design and should always be oriented towards promoting the learner's reasoning. Although there is ample scope for research, unavoidable questions arise: from what point is it relevant to introduce AI in this process; **could premature use weaken orthographic learning before basic knowledge is consolidated**; how would it affect retention in the long term; and, in any case, if handwriting helps retention, when and how should it be combined with digital writing?

Ultimately, since spelling skills require **automation**, the basic principles of learning are essential: deliberate practice, spaced repetition, direct feedback and, most importantly, reflection on one's own mistakes. In education, technology should be a support, not a shortcut. As Weidlich et al. (2025) warn, **AI does not teach on its own: its true pedagogical value lies in its integration within a well-defined didactic framework**, with clear objectives adapted to the learner's stage of development.

Let us now turn to the back wheel: **composition strategies**. This is perhaps the most delicate area, for here lies the core of the "writing for thinking" we have

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advocated. **Writing is not just a product; it is first and foremost a formative process**, since writing a text involves thinking about what will be written, organising ideas, making linguistic decisions, considering the reader, revising and rewriting. This deepens knowledge and contributes to the development of critical thinking. **If we delegate these tasks to AI too early, do we run the risk that students will take their foot off the pedal** and fail to acquire the cognitive skills to think clearly and communicate effectively? Conversely, if AI can enhance, support or extend thinking, what strategies might be effective?

In learning composition strategies, we have devoted central attention to **the sentence as a unit of thought**. It is clear that asking an AI to combine or expand sentences short-circuits syntactic learning. If a learner is given the task of combining two sentences ("The Romans built aqueducts. They transported water to the cities.") and simply asks an AI to do so, the learning is null, since the cognitive effort of identifying the logical relationship between ideas and selecting the appropriate syntactic structure ("The Romans built aqueducts to transport water to the cities") is bypassed. In this respect, Luri (2025, para. 1) emphasises that "there is no way to develop critical thinking by ignoring the use of conjunctions", which underlines that **the reflexive mastery of textual structure is inseparable from the development of critical thinking.**

At this level, AI could be a **tool for modelling and analysis, but not for production**. If used to show the learner various ways of combining sentences and then guided to identify patterns or justify linguistic choices, could it enhance learning? But from when? It seems clear that, if it is used as a shortcut to avoid the effort of syntactically constructing thought, learning would be nullified. In this respect, a possible line of research would be to explore whether the guided use of AI as a tool for parsing and modelling syntactic structures contributes to improving competence in sentence composition, compared to non-technology-supported instruction. Put in the form of a short question: **can AI encourage thinking about syntax without replacing its execution?** The answer to this

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question will be essential to decide whether, on this stretch of road, AI can accompany the cyclist... or whether it is pedalling for him.

The same approach applies to the construction of **paragraphs** understood as **micro-essays**. As I have justified, teaching how to structure a paragraph with a topic sentence and supporting ideas is one of the most effective practices for improving content comprehension. It is plausible that, if the learner writes their own paragraph and is taught to ask the AI: "Analyse this paragraph. What is the topic sentence? Do the supporting ideas support it?", the AI would function as a mirror that returns an X-ray of their own thought structure. In this case, a research question might be: does the use of AI as a tool for analysing the structure of one's own paragraphs improve students' textual coherence more than peer review guided by a checklist, for example?

Writing complete texts to tell, explain or convince (narrative, expository or argumentative) using subject content is a powerful tool for learning, as it forces the student to retrieve information, organise it and transform it into knowledge. Logically, if the student asks an AI to write the entire text, the cognitive process disappears: there is no information retrieval, no decision making, no effort to articulate ideas.

Conversely, how would it improve the composition process if AI is used after the student has already written a first draft? For example, by asking it to act as a critic who detects weaknesses in the argumentation, by asking it to provide an alternative model against which to compare the text or to point out ambiguities. Perhaps, in this context, AI can become an ally, as **long as it does not replace the initial cognitive effort, the learner remains in control of the text and reasoning is stimulated.** But by means of what strategies is this made possible? A possible line of research in this area would be to explore: to what extent does the use of AI as a draft revision tool favour argumentative quality, compared to an exclusively teacher-guided, peer-guided or self-revision process? And in this scenario, how

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could collaborative work be integrated, and does AI enrich these practices or displace them?

It is now time to look at the chain and the pedals: **memory, vocabulary and disciplinary knowledge**, without which writing does not progress. These could be enhanced if AI is used as a tool for quick reference or clarification of concepts. However, when the learner resorts to it before activating their own knowledge, the learner bypasses one of the most powerful practices for learning: **evocation or retrieval practice**. As Ruíz (2020) emphasises, the cognitive effort involved in trying to recall information is precisely what consolidates long-term memory. In this context, the questions arise: is the consolidation of learning weakened if this resource is abused, can instant access to explanations inhibit personal elaboration of knowledge and lead to shallow texts, and **how does AI expand the learner's knowledge base - their memory, vocabulary and mastery of content - while fostering the cognitive processes that build it?**

Similarly, if the writing handle - the **purpose and audience -** defines the direction of the text, what happens when AI decides the tone or focus? If it is delegated to adapt to a specific audience, is the opportunity to develop rhetorical flexibility and awareness of the addressee lost, or, conversely, could access to multiple versions of the same text for different contexts facilitate thoughtful analysis? This begs the question of what impact this has on the learner's discursive awareness: **do they really understand the features of each register or do they simply imitate them?** This is undoubtedly another interesting line of research.

Finally, it is essential to reflect on the cyclist: their **self-regulation and perception of self-efficacy**. Writing, like pedalling, requires self-confidence and training. If the student feels that the AI writes better than them, can they become demotivated or consolidate the belief that they cannot write without help? On the other hand, if, as L'Ecuyer (2019) points out, early use of technology fosters an external locus of control (the feeling that it is the tool, not the person, who directs

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the action), do we not run the risk of students transferring that same **dependence to AI writing**, weakening their self-regulation? In this respect, Selwyn (2020) warns that machine-guided learning may lead some people to take a passive and manipulative approach to learning in the future, which would defeat the very purpose of education. How, then, can we ensure that they retain an internal locus of control that allows them to **consciously decide when and how to rely on the tool**?

In this aspect, the gradual release of responsibility model, the use of AI could be integrated in a stepwise manner, with the aim that the learner learns when and what to rely on it for. A relevant line of research could be: **how does the progressive and reflective use of AI influence the development of self-regulation and writing self-efficacy?** Similarly, it could be explored whether an intervention based on the SRSD model, which integrates the strategic use of AI, would have a greater impact on self-efficacy than traditional SRSD interventions.

In short, **the advent of AI does not invalidate what we know about how people learn to write**. Artificial intelligence does not change the *what* of teaching writing, but it does raise new questions about the *how*. According to Sedita (2025), **the challenge is not technological, but pedagogical**. Future research should identify and validate didactic uses that harness the potential of the tool without sacrificing the fundamental learning that writing promotes.

Based on the above, some **principles** for the use of AI in basic education can be established:

1. **The first thing is to learn how to write**. AI should be reserved for advanced stages of learning, when the student has already automated transcription skills and extensively used analogical composition strategies.

2. **Writing is a process, not a product**. AI should not replace it, but complement it. The formative value of writing is in doing it - thinking, planning, organising, drafting and revising - not just in getting a text written.

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3. **The cognitive effort is irreplaceable**. AI should not replace the mental effort that writing (and learning) requires: organising ideas, making linguistic decisions or synthesising information.

4. **Think before consulting**. The learner must first face the text alone. Thinking, organising and revising are essential steps that cannot be delegated prematurely. Subsequently, AI can enrich the different phases of composition.

5. **Thinking about language is indispensable**. It is not enough to imitate; one must understand why and how the text is structured, as well as the linguistic decisions implied by the context.

6. **AI should not supplant the teacher or the group**. Discussions among students, peer review, feedback and dialogue with the teacher remain irreplaceable elements. AI can enrich these interactions, but should not replace them.

Conclusions

This paper has been articulated around the central idea that teaching to write is teaching to think. From this perspective, ensuring the mastery of writing -especially among students with learning difficulties or in unfavourable socio-economic situations- is an essential commitment to inclusion, intellectual development and full participation in academic and social life.

For this pedagogical commitment to become a reality, based on the evidence presented, schools should focus their efforts on:

1. **Lay a solid foundation from the beginning of schooling:**
   - Automate **transcription skills** (handwriting fluency and orthographic awareness) through explicit, systematic and early instruction.

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- Promote **oral language** and the **acquisition of knowledge** about the world from the earliest stages, as these are the foundation on which both composition strategies and the ability to write with depth and coherence are built.
- Assess pupils' progress systematically in order to **detect early** learning **difficulties** in writing and to carry out preventive interventions tailored to their needs.

2. **Integrate writing as the core of curricular learning:**

- Use **writing as a tool for learning** in all areas and subjects, understanding that each discipline has its own ways of constructing and communicating knowledge and that **"writing to learn"** is one of the most effective strategies for consolidating it.
- Develop a **knowledge-rich curriculum**, as the quality of writing depends directly on the mastery of the content being written about.
- Plan the teaching of **subject-specific vocabulary**, since a broad and precise lexicon is essential for communicating ideas clearly and rigorously.

3. **Provide explicit teaching of written composition:**

- Explicitly and progressively teach **composition strategies**, starting with the **sentence** as the basic unit of thought, progressing to the construction of coherent **paragraphs** and, finally, to the writing of **complete texts**.
- Model the writing process (**planning, writing and revision**) and teach self-regulation strategies that allow students to control their own process and feel competent as writers.

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- Design writing tasks with well-defined **purposes**, whether communicative (aimed at a real or simulated audience), didactic (to deepen content and organise ideas) or other (expressive, creative...), which help students to make sense of what they write.

4. Consciously approach writing tools:

- Prioritise **handwriting** in the **early stages** for its cognitive and motor benefits, which are irreplaceable in the development of learning to write.
- Value handwriting at all stages for its unique benefits in cognitive development and **consolidation of learning**.
- Integrate the use of **digital tools** in a thoughtful and pedagogical way, ensuring that they enhance learning rather than replace the cognitive effort and reflection involved in writing.

To teach writing is, in the end, to educate citizens capable of thinking critically and communicating clearly, as writing is a fundamental tool for knowledge, equity and freedom.

If a rich child finds that, upon arriving at school,

the doors of knowledge are closed to them,
they have other places to turn to.
The poor child does not.

(Gregorio Luri, 2020)

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