universidad de león

PROGRAMA DE DOCTORADO EN PSICOLOGÍA EDUCATIVA Y CIENCIAS DE LA EDUCACIÓN

DOCTORAL DISSERTATION

COMPONENT ANALYSIS OF STRATEGY INSTRUCTION IN WRITING COMPOSITION: EVALUATION AND INSTRUCTION

ANÁLISIS COMPONENCIAL DE LA INSTRUCCIÓN ESTRATÉGICA EN COMPOSICIÓN ESCRITA: EVALUACIÓN E INSTRUCCIÓN

Paula López Gutiérrez

León, 2019

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DOCTORAL DISSERTATION

Presented by Paula López Gutiérrez

Supervised by Dr. Raquel Fidalgo and Dr. Mark Torrance

León, 2019

A mis padres y hermanos,

A mi familia

A ti Vicen, por ser el mejor compañero

de viaje que podría tener

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A pesar de ser una de las primeras partes que se encuentra al abrir una tesis doctoral esta sección suele ser la última en escribirse. Al menos así lo he decidido yo, ya que no se me ocurre una mejor forma de cerrar esta etapa que mostrando el agradecimiento que tengo hacia todas las personas que de un modo u otro han hecho que hoy esté aquí.

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"Lo importante no es el destino sino la compañía"

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Abstract

This doctoral dissertation focuses on the improvement of students' written competence from a psychological perspective. The dissertation comprises four studies that contribute to two research lines in the writing research field. The first line (Study 1) addresses the analysis of upper-primary students' writing process (5th and 6th grade). The second line, main focus of this dissertation, deals with the component analysis of strategy instruction to improve the writing competence of students at the final years of Primary Education on the basis of its instructional components, modelling vs. direct instruction of writing strategies (Study 2); its contents, related with instruction on planning and revising writing processes (Study 3); and a detailed description of strategy instruction writing interventions through the use of a specific report system (Study 4).

The first study aims to analyse in-depth, using online measures, upper-primary students' use of the different writing processes, their time distribution during composing and the relationship between these two factors and compositional quality. The sample comprised 120 students in the last two years of Primary Education, who wrote an argumentative text in pairs while thinking aloud. Students' verbalisations were analysed through a comprehensive and mutually exclusive category system where the main writing processes and subprocesses were included. Results showed that students make little use of high-level processes such as planning and revision, following a linear writing process. Finally, we did not find any relationship between the time dedicated to each process or their time distribution and compositional quality.

The second study aims to conduct a comparative analysis of the effects of two instructional components usually included in strategy instruction, that is, direct instruction and modelling, to improve compositional quality in students in the last two years of Primary Education. This study followed a quasi-experimental design in which six 5th and 6th grade classes (N = 133 students) were randomly assigned to two experimental conditions, where students were instructed in the use of planning and drafting strategies, either through direct instruction (N = 46) or modelling (N = 45); or a control group (N = 42). Students wrote two argumentative texts, first individually and then in pairs, before and after the intervention. Findings pointed to both direct instruction and modelling are equally effective for the improvement of students' writing competence

at these educational stages. No differences were found neither according to the assessment task nor regarding students' competence level.

The third study has two aims. We firstly aimed to analyse whether instructing upper-primary students on revision processes provided them with an additional benefit over instruction focused solely on planning processes through the establishment of communicative goals. The second aim was to compare the efficacy of two instructional approaches focused on the revision process to improve students' writing competence. One of these was based on explicit instruction on revision strategies, while the other focused on increasing audience awareness. We followed a quasi-experimental design in which six 6th grade classes (N = 107 students) were randomly assigned to two experimental conditions and a control group. Students in all conditions were first instructed in planning strategies focused on goal setting, which was the central point of instruction in the control group (N = 33) throughout the course of the intervention. Students in both experimental conditions were additionally instructed on revision processes, either by teaching explicit revision strategies (N = 37) or by enhancing audience awareness (N = 37). Students completed a writing and a revision task before and after the intervention and two months later. Results showed that revision instruction provides additional benefits over planning-only instruction when it comes to improve students writing competence. Effects were maintained over time and transferred to an untaught text genre, both in terms of compositional quality and revision skills. No differences were found between the revision approach focused on teaching explicit revision strategies and that focused on enhancing audience awareness.

Finally, the fourth study has two aims. First, we aimed to present a report system to provide exhaustive descriptions of writing interventions in terms of their content and instructional design. Second, we aimed to provide a comparative analysis, through the proposed report system, of two instructional programs with a similar instructional design but which differ in their content according to two revision instructional approaches: the reader and strategy-focused approaches. This study brings forward the need to use this kind of report systems. This would have a positive impact from a scientific point of view regarding both the design and the dissemination phases of the study. Also, from an educational viewpoint, it would facilitate a deeper and more detailed knowledge about the instructional programs under analysis, thereby making it easier to transfer the scientific knowledge to the educational field.

Considering the overall findings from all studies, we can conclude the following. First, it is necessary to instruct upper-primary students on the use of high-level cognitive processes such as planning and revision by means of empirically-validated instructional practices to improve their writing competence. Second, strategy instruction is effective to improve the writing competence of students at these educational stages, though ensuring its effectiveness does not necessarily require the implementation of the whole instructional sequence with all their instructional components and contents. Our results suggest that students do not need to be explicitly instructed on planning and revision, but they are able to infer the necessary writing knowledge from observational learning. Finally, it seems necessary to use report systems to describe writing interventions such as the one presented in this dissertation, since this have a positive impact at both the scientific and the educational level.

Resumen

La presente tesis se centra en la mejora de la competencia escrita del alumnado desde perspectivas psicológicas. Está constituida por cuatro estudios que se enmarcan en dos líneas de investigación en el ámbito de la composición escrita. La primera de ellas (Estudio 1) se relaciona con el análisis del proceso de escritura de los estudiantes de últimos cursos de Educación Primaria (5º y 6º). La segunda línea de investigación, eje central de la tesis, se centra en el análisis componencial de la instrucción estratégica para la mejora de la competencia escrita del alumnado al final de la Educación Primaria en función de sus componentes instruccionales, modelado cognitivo estratégico vs. instrucción directa de estrategias (Estudio 2); de sus contenidos, procesos de revisión textual y/o de planificación (Estudio 3); y de su descripción exhaustiva a partir de un sistema de reporte (Estudio 4).

El primer estudio tiene como objetivo analizar de forma pormenorizada a través de medidas online el uso que los estudiantes de últimos cursos de Educación Primaria hacen de los diferentes procesos de escritura, su distribución temporal durante el proceso de escritura, así como la relación entre ambos aspectos y la calidad textual de las composiciones del alumnado. La muestra estuvo compuesta por 120 alumnos de últimos cursos de Primaria, los cuales escribieron un texto argumentativo por parejas mientras pensaban en voz alta. Las verbalizaciones de los estudiantes fueron analizadas en base a un sistema de categorías comprehensivo y mutuamente excluyente, donde se consideraron los principales procesos y subprocesos de escritura. Los resultados evidenciaron que dichos estudiantes hacen un escaso uso de procesos de alto nivel cognitivo, como la planificación y la revisión textual, siguiendo un proceso de escritura lineal. Por último, no se encontró una relación entre el tiempo dedicado a los diferentes procesos o su distribución temporal y la calidad de los textos de los estudiantes.

El segundo estudio tiene por objetivo analizar de forma comparativa el efecto de dos componentes instruccionales típicamente incluidos en la instrucción estratégica como son la instrucción directa y el modelado, para la mejora de la calidad textual de los estudiantes de últimos cursos de Primaria. El estudio siguió un diseño cuasi-experimental en el que seis clases de 5º y 6º de primaria (N = 133 alumnos) fueron asignadas aleatoriamente a una de las dos condiciones experimentales, en la que los estudiantes fueron instruidos en el uso de estrategias de planificación y redacción bien a través de la

instrucción directa (N = 46) o a través del modelado (N = 45); y un grupo control (N = 42). Los estudiantes escribieron dos textos argumentativos, uno de forma colaborativa y otro individual, antes y después de la intervención. Los resultados evidenciaron que la instrucción directa y el modelado son igualmente efectivos para la mejora de la competencia escrita del alumnado en estas edades, sin encontrarse diferencias en función de la tarea de evaluación implementada o el nivel de competencia del alumnado.

El tercer estudio tiene dos objetivos. El primer objetivo, se centra en analizar si instruir al alumnado en los últimos cursos de Primaria en procesos de revisión proporciona a los estudiantes un beneficio adicional respecto a la instrucción exclusiva en procesos de planificación a través del establecimiento de objetivos comunicativos. El segundo objetivo, pretende analizar de forma comparativa la efectividad de dos enfoques instruccionales centrados en el proceso de revisión, basados en la instrucción explícita de estrategias de revisión o en el fomento de la conciencia de la audiencia, para la mejora de la competencia escrita del alumnado. Se siguió un diseño cuasi-experimental en el que seis clases de 6º de Primaria (N = 107 alumnos) fueron asignadas aleatoriamente a dos condiciones experimentales y un grupo control. Inicialmente, los estudiantes en todas las condiciones fueron instruidos en estrategias de planificación centradas en el establecimiento de objetivos, lo que siguió siendo el foco de instrucción en el grupo control (N = 33). Sin embargo, los estudiantes en las condiciones experimentales fueron instruidos adicionalmente en procesos de revisión a través de dos enfoques, bien centrados en la instrucción explícita de estrategias de revisión (N = 37) o a través del fomento de la conciencia de la audiencia (N = 37). Los estudiantes completaron una tarea de escritura y otra de revisión antes y después de la intervención y dos meses después. Los resultados evidenciaron que la instrucción en revisión proporciona beneficios adicionales respecto a la mejora de la competencia escrita del alumnado frente a la instrucción centrada exclusivamente en procesos de planificación. Dichos efectos se mantuvieron en el tiempo y se transfirieron a un género textual no trabajado durante la instrucción, tanto a nivel de calidad textual como de habilidades de revisión. No se encontraron diferencias entre el enfoque centrado en la instrucción explícita de estrategias de revisión y el fomento de la conciencia de la audiencia.

Finalmente, el cuarto estudio tiene un doble objetivo. El primer objetivo se centra en proporcionar un sistema de reporte para la descripción de intervenciones en escritura de forma exhaustiva a nivel de contenido y diseño instruccional. El segundo objetivo se

centra en proporcionar un análisis comparativo a través del sistema de reporte propuesto de dos programas de instrucción similares en su diseño instruccional pero que variaron en el contenido de acuerdo a dos enfoques instruccionales centrados en el proceso de revisión: el enfoque del lector o el enfoque estratégico. Tras la realización del estudio se ha puesto de manifiesto como la utilización de dicho sistema de reporte repercutiría positivamente, a nivel científico, tanto en la fase del diseño del estudio instruccional, como en la fase de difusión y publicación del estudio. A su vez, a nivel educativo, facilitaría un conocimiento más profundo y detallado de los programas instruccionales estudiados, lo que podría facilitar la transferencia del conocimiento científico al ámbito educativo.

Considerando los resultados encontrados en los diferentes estudios en su conjunto es posible concluir lo siguiente. En primer lugar, es necesario instruir al alumnado en los últimos cursos de Educación Primaria en el uso de procesos de alto nivel cognitivo como la planificación y revisión textual a través de prácticas empíricamente validadas para la mejora de la competencia escrita del alumnado. En segundo lugar, la instrucción estratégica es efectiva para la mejora de la competencia escrita del alumnado en estas edades, si bien para asegurar su efectividad no es necesario aplicar la compleja secuencia instruccional, en relación a sus contenidos y componentes instruccionales, de forma global. Específicamente, podría concluirse que no es necesario instruir al alumnado de forma explícita en procesos de planificación y revisión, sino que en estas edades el alumnado es capaz de inferir el conocimiento de escritura necesario a partir del aprendizaje por observación. Finalmente, parece necesario utilizar sistemas de reporte para la descripción de intervenciones en escritura como el presentado en esta tesis por su impacto positivo tanto a nivel científico como aplicado.

1 INTRODUCTION

Introduction

The doctoral dissertation presented belongs to the Doctoral Program in Educational Psychology and Educational Sciences (Programa de Doctorado en Psicología Educativa y Ciencias de la Educación) of the University of Leon regulated by Real Decreto 99/2011. In accordance with this regulation, the Doctoral Program establishes the need to carry out several mandatory activities with the aim of favouring the research training of PhD students. These activities include the participation in, and contribution to, international conferences, participation in academic seminars for doctoral students, meetings with the dissertation supervisors and the research team, and management and evaluation of scientific research, as well as other complementary activities (e.g., attendance at statistics courses). Especially important are two additional activities that have a direct implication in the format of this dissertation. The first activity is related to the realisation of a three-month research stay abroad at a prestigious university. This research stay took place at Antwerp University and was supervised by Professor Gert Rijlaarsdam, a renowned researcher in the writing research field. During this stay, Professor Rijlaarsdam's guidance and exhaustive supervision was an invaluable support for the advancement of the research included in this dissertation. This research stay was funded by the Spanish Ministry of Education, Culture and Sport (Ministerio de Educación, Cultura y Deporte) through the concession of a grant to do a research stay abroad (Reference: EST15/00462). The completion of this stay allowed this dissertation to be recognised as an international dissertation.

The second mandatory activity is the publication of a minimum of three scientific manuscripts in high quality journals, at least one of which should be indexed in the Journal Citation Reports (JCR). The remaining two journals selected for publication should have high-quality impact factors index in In-RECS, Google Scholar Metrics or Scopus. Specifically, this dissertation includes four manuscripts, three of which have been published in accordance with the doctoral program requirements (two in Q2 JCR and one in Q1 SJR), with the fourth currently in the publication process in a journal indexed in the Journal Citation Reports.

Compliance with this doctoral requirement makes possible not only the defence of the dissertation but also their presentation as a compendium of publications (compendio de publicaciones). This means that the dissertation will consist of a

compilation of the research works published by the doctoral candidate in highly ranked scientific journals relevant to her field of knowledge, which is the writing and educational research field.

This dissertation is related to the research line in writing composition led by Dr. Raquel Fidalgo and Dr. Mark Torrance, both supervisors of this dissertation. One of the research lines of these authors concentrates on analysing the effectiveness of the strategy-focused intervention Cognitive Self-Regulation Instruction (CSRI), which was designed by both authors to improve elementary student writing skills (e.g., Fidalgo, Torrance, & García, 2008; Torrance, Fidalgo, & García, 2007). Additionally, these authors have been interested in exploring the mechanisms by which strategy-focused instruction is effective (e.g., Fidalgo, Torrance, Rijlaarsdam, Van den Bergh, & Álvarez, 2015; Fidalgo, Torrance & Robledo, 2011; Torrance, Fidalgo, & Robledo, 2015). This line of research has been funded by the Spanish Ministry of Economy and Competitiveness (Ministerio de Economía y Competitividad) through the concession of a competitive project (Reference: EDU2015-67484-P MINECO/FEDER), awarded to Dr. Fidalgo for the period 2016–2020. This is the main research line in which the research involved in this dissertation is framed. It is also noteworthy that the PhD candidate received a pre-doctoral grant (*Formación de profesorado Universitario-FPU*) awarded by the Spanish Ministry of Education, Culture and Sport (*Ministerio de Educación, Cultura y Deporte*) for the period 2014–2018 (Reference: FPU13/06428).

According to the regulations of the University of León for the presentation of PhD dissertations as a compendium of publications, the present dissertation will be composed of the following sections: introduction, aims, method, results, and conclusions. The results will be established on the basis of the different publications included in the dissertation. Considering this general format, an overview of the chapters that will compose this dissertation report is provided.

Chapter Overview

All research must be based on a broad theoretical and empirical review that supports the particular research project. Although a specific framework will be provided in each of the publications included in the dissertation, it is necessary to provide a general context that frames the research work included in this dissertation as a whole. This is the

main aim of the *first chapter*. In this introductory chapter, a description of the general and developmental models of writing in which the dissertation is framed is presented. These theories of writing provide the base for understanding the complex cognitive processes involved in writing, and serve to guide the development of the empirical studies presented in the different chapters. More specifically, this review provides the theoretical framework needed to comprehensively evaluate the writing process of upper-primary students as well as to theoretically justify the need to instruct young students in high-level processes such as planning or revision to improve their writing skills. Next, a review of writing instruction meta-analysis aimed at identifying effective instructional practises to improve student writing skills is presented. This is an important point given the negative findings about student writing competence across many countries and different educational levels. The results of these meta-analyses have shown that strategy instruction is one of the most effective instructional practises for improving student writing skills. Strategy instruction in recent years has been a major focus of research in the area of instruction in written composition. However, the complex and multicomponent nature of this kind of intervention raises new questions about the effectiveness of different content and instructional components included within it. This is the main research line of the three instructional studies included in the dissertation. Therefore, strategy instruction will be the focus of the last section of the introduction and a critical point of this dissertation. Thus, we will describe the aims of strategy instruction, its theoretical bases, instructional sequence and the need for component analysis studies. Finally, an overview of componential studies and how the instructional studies included in the dissertation have been designed to contribute to this research line will be presented.

The *second chapter* presents the goals and method of the dissertation according to the guidelines of the compendium of publications format. The dissertation has four main aims that were operationalized in four studies, one of an evaluative nature, two of an instructional nature and one of a descriptive nature. In order to facilitate the reading of this chapter, the goals of the dissertation will be explained in the context of each study as well as the method followed in each.

Following the compendium of publications format, the next four chapters will present an exact copy of the publications which form the compendium of publications of the dissertation. These studies correspond with the results of the dissertation.

Each chapter will be composed of the sections generally included in scientific publications according to the APA guidelines (APA, 2019). However, there may be some differences between the chapters according to the journal requirements or the nature of the studies. Each chapter can also be read on its own.

In *chapter three,* we will present the first study, entitled 'The online management of writing processes and their contribution to text quality in upper-primary students' (López, Torrance, & Fidalgo, 2019). This study was published in the journal *Psicothema* (Q2 JCR; impact factor: 1.551). The study has an evaluative nature and is focused on analysing the time that upper-primary students devoted to writing processes, their distribution during composition and the contribution of both aspects to text quality. The sample comprised 120 upper-primary students (10-12 years) who were asked to write an argumentative text in pairs under thinking aloud conditions. Verbalizations were analysed by means of a comprehensive coding scheme based on the revision of the processes included in the major models of writing in which the dissertation is framed. This allowed the authors to comprehensively analyse different writing processes, such as planning, translating and revising, as well as subprocesses. For the planning process, we considered goal setting, organisation and content generation subprocesses. Regarding revision, we included reading, mechanical editing, mechanical evaluation, substance editing and substance evaluation. A distinction was included according to the nature of editing and evaluation subprocesses (i.e., mechanical and substantive) since the influence of student revising skills on writing quality seems to depend in part on the nature of the revisions. Also, student writing performance was assessed through reader-based measures of text quality. From the results of the study, it will be possible to know the writing process of upper-primary students, not only considering how much time they devote to different writing processes but also when they engage in them during composition, and to what extent both aspects contribute to text quality. Within this dissertation, this study will serve to detect the needs of upper-primary students regarding their writing process and determine the need to implement strategy instruction interventions in the educational context in order to respond to the possible needs found. This is an essential first step in understanding how to improve the writing competence of upper-primary students.

In the *fourth chapter,* we will present the second study entitled 'Effects of direct instruction and strategy modelling on upper-primary students' writing development' (López, Torrance, Rijlaarsdam, & Fidalgo, 2017). This study was published in the journal

Frontiers in Psychology (Q2 JCR; impact factor: 2.323). The study has an instructional nature and is focused on exploring the specific effects of two key components of strategy instruction, that of direct teaching of writing strategies and modelling of strategy use. Six classes (133 students) of upper-primary education (10–12 years) were randomly assigned to one of three experimental conditions in which they received instruction aimed at developing effective strategies for planning and drafting: direct instruction (N = 46), modelling (N = 45) or the control group (N = 42) with no strategy instruction. Writing performance was assessed before the intervention and immediately after the intervention with two tasks, one collaborative and the other individual, to explore whether differential effects resulted from students writing alone or in pairs. Writing performance was assessed through reader-based and text-based measures of text quality. The results of this study will shed light upon the contribution of both components for the development of upper-primary student writing skills in a comparative way. This may help to determine whether students in the last years of primary education need explicit instruction in writing strategies or, on the contrary, they benefit more from the observation of a model applying these strategies in a self-regulated way. This could boost the simplification of the complex instructional sequence generally included in strategy instruction interventions.

Chapter five presents the third study, entitled 'Strategy learning or understanding reader response? An evaluation of two approaches to developing sixth-grade students' writing through revision instruction' (López, Torrance, Rijlaarsdam, & Fidalgo, 2019). This study has been submitted for publication in a journal indexed in the Journal Citation Report. The study has an instructional nature and is focused on exploring whether reader-focused and strategy-focused approaches aimed to improve revision skills resulted in improvements to 6th grade students' written composition above and beyond strategy instruction that taught students to set communicational goals for their text (planning instruction). A sample of 107 sixth-grade Spanish students (age 11–12 years) without specific learning difficulties participated in the study. Students were taught the features of good argumentative text and goal-setting strategy. They were then divided, by class, into three conditions. Students in the Reader Focused condition (N = 37) observed a reader thinking aloud while trying to comprehend imperfect texts. Students in the Strategy Focused condition (N = 37) learned, through direct instruction and modelling, a 5-step revision procedure. The control group (N = 33) continued training in setting communicational goals. Student writing performance was assessed on composition and a

revision task before intervention, immediately after intervention, two months later and in a text type different from that taught (transfer). Based on the results, we could conclude if student instruction at this age on revision processes will provide them a benefit over-and-above goal-setting training and if instruction on specific revision strategies is needed, or if similar results can be achieved by making them aware of audience needs.

In *chapter six*, we will present the last study included in the dissertation, entitled 'How to report writing interventions? A case study on the analytic description of two effective revision interventions' (López, Rijlaarsdam, Torrance, & Fidalgo, 2018), which is a report about instructional design based on a previous instructional study. This study is part of a special issue about 'How to report instructional interventions in writing research' which was published in the *Journal of Writing Research* (Q1 SJR; impact factor: 1.035). The special issue's main aim was to establish a blueprint on how to report writing intervention studies in research papers. To this purpose, the special issue included six manuscripts in which the authors systematically and analytically described a broad range of writing interventions aimed at learning to write in primary, secondary and higher education using as a guideline the report system proposed by Rijlaarsdam, Janssen, Rietdijk and Van Weijen (2018). As one of the contributions included in this special issue, we presented a comparative report of two effective instructional programs, the same ones that were implemented in the second intervention study (chapter five), focused on the improvement of upper-primary students' writing competence through the promotion of revision skills. The two programs shared the main aim but had different instructional approaches. We contrasted writer-focused instruction with reader-focused instruction. To provide a valid report on the similarities and differences of the two programs, we applied two complementary report dimensions based on Rijlaarsdam et al.'s (2018) report system. The first dimension, what the researcher intends students to achieve, provides insight into the types of student intermediate learning objectives and how they are sequenced. The second dimension, how to teach, includes the instructional design principles which relate the intermediate learning objectives to the specific learning and instructional activities implemented in certain conditions. This detailed description would allow a more comprehensive analysis of the similarities and differences between the instructional programs and also discuss the implications of using this kind of reporting system as a useful tool for reporting—and designing—writing interventions.

Finally, *chapter seven* serves as a concluding chapter. Based on the results obtained and described in each of the studies included in the dissertation, the final conclusions of the dissertation will be detailed. We will also discuss some limitations of the dissertation as well as suggestions for future research. According to the regulations of the dissertations presented with the international mention, *chapter eight* will consist in a replica of the chapter seven but in Spanish.

Theoretical and Empirical Framework

The critical role of writing in society is undeniable. Writing is a key tool that serves to satisfy multiple needs at the personal, social, academic and work levels. People who do not learn to write well will find obstacles to communication with others, to successful participation in civic life, and to academic and occupational success (Graham & Perin, 2007). Although writing is fundamental throughout people's lives, it is especially important at the earliest ages where the bases for future achievement are established. In school, children who face problems with writing are at a disadvantage, given that writing is the main tool available for children to learn and show what they know (Graham, 2006). In the present dissertation, we will focus specifically on upper-primary students (5th and 6th grades; 10–12 years) for two main reasons. First, in the upper grades of elementary school, compared to younger children, the automation of student transcription skills is increased through maturation and practise. This enables upper primary students to engage in high-level writing skills such as planning and revising (Berninger et al., 1992). Second, there is no reason to wait until later grades to address literacy problems that probably have their origin in the elementary educational stage (Graham, McKeown, Kiuhara, & Harris, 2012). Applying evidence-based writing practises with elementary grade students should reduce the number of young students who reach middle school and do not write well enough to meet grade-level demands (Harris, Graham, & Mason, 2006). It is therefore important that students acquire the writing skills necessary to satisfactorily cope with academic writing demands by the end of elementary school.

Given its importance, writing achievement and writing instruction should be considered a priority in elementary schools. The need to provide students with the opportunity to become competent writers has been recognised in educational laws in different countries around the world from the initial educational stages. In Spain, the last educational law for the elementary educational stage (*Real Decreto 126/2014, de 28 de*

febrero del Ministerio de Educación, Cultura y Deporte) established as one of the main goals of this educational stage the need to facilitate student learning of writing among other critical skills, such as oral expression, comprehension and reading. Additionally, this regulation established certain general guidelines for the teaching of writing in schools as a way to promote student writing skills. In the subject of Spanish Language and Literature in which learning to write is considered, it was established that elementary students should be instructed in writing processes, such as planning, translating and revising; that assessment should not only be focused on student textual products but also on their writing process; and, finally, that students need to be provided with the necessary knowledge about the different textual genres.

The problem, however, is that many students in Spain do not meet writing standards (Ministry of Education, 2010, 2011). Similar findings have been found in other countries, including the United States (NCES, 2012); The Netherlands (Kühlemeier, Van Til, Feenstra, & Hemker, 2013); and Portugal (Festas et al., 2015). This common outcome in such different contexts can probably be explained by the cognitive challenges that writing imposes on young writers.

Revision of Cognitive Models of Writing: Cognitive Challenges for Developing Writers

The birth of the first seminal model of writing in the 1980s (Flower & Hayes, 1980) produced a shift in the writing research field. From then on, researchers not only were interested in studying textual product, which had dominated earlier writing research, but also the processes by which a written composition is produced. Several models have since arisen. Some models have modified the previous Hayes and Flower (1980) model (Hayes, 1996, 2012) or have emphasised different aspects of writing (e.g., working memory, Kellogg, 1996), while still others have differentiated between adults and novice writers (Bereiter & Scardamalia, 1987; Berninger & Winn, 2006). However, a clear picture emerges from all of them: The view of writing as a complex and costly skill that places multiple cognitive demands on the writer, especially when they are young.

In the next section, we will provide an overview of those cognitive models of writing in which the dissertation is framed. These models have laid the theoretical foundation for the understanding of writing from a cognitive perspective and have guided

the development of the studies included in this dissertation. First, we will provide a revision of the first cognitive model of writing developed and later modified by Hayes and Flower (1980, 1996). We will focus on this model, as it remains one of the most prominent models within the cognitive approach to writing, as the authors were the first to identify the different cognitive processes and components involved in writing. Although this model was subsequently elaborated, it continues to represent the core component in more recent cognitive models of writing (Berninger & Winn, 2006; Hayes, 2012; Kellogg, 1996). As this dissertation is focused on elementary school students, we will then outline the specific models that have addressed the development of writing in young students.

General cognitive models of writing.

Hayes and Flower (1980) developed the first cognitive model of writing. These authors studied the mental processes that mature writers employed while they solved a writing problem through the use of thinking-aloud protocol analysis. Verbal protocols involved asking writers to think aloud as they composed to provide 'a description of the activities, ordered in time, in which a subject engages in while performing a task' (Flower & Hayes, 1980, p. 4). The resulting verbal protocols were analysed with the aim of identifying the mental operations used by writers. The analysis of the verbal protocols allowed the authors to develop what is arguably still one of the most influential models of writing.

In their initial model, Hayes and Flower (1980) identified three basic and interacting components. One component, *the task environment*, involved everything outside the writer that influenced writing performance. These external factors included the writing assignment (e.g., topic, audience and motivating cues) and the text produced so far. Another component, *cognitive processes*, described the mental operations that writers employed while writing. These included planning what to say, generating and organising ideas, and setting goals; translating, which included generating written text; and revising, which included reading, evaluating and revising sub-processes. The authors proposed that these processes are controlled by 'a monitor' that determines when the writer moves from one process to another. Finally, the last component is the *writer's long-term memory* which included knowledge of topic, audience and genre.

The main contributions of this model were twofold. First, the authors were the first to identify the cognitive processes involved in writing, namely planning, translating and revising. In fact, most of the later models have considered these processes as a core component of writing (Berninger & Swanson, 1994; Berninger & Winn, 2006; Hayes, 1996; Hayes & Flower, 1986; Kellogg, 1996). Additionally, several correlational and intervention studies have shown that the use of these processes is related to the composition of higher quality texts both in expert and novice writers (for a review, see Berninger, 2012). Second, writing has since then been defined as a recursive activity in which one process may interrupt others during composition. Research has found that writers differ in the way they distribute cognitive processes during writing. Several studies have determined that the relationship of a specific writing process and text quality depends on when the process is activated during composition (Breetvelt, Van den Bergh, & Rijlaarsdam, 1994; Van den Bergh & Rijlaarsdam, 1999, 2001).

Some years later, Hayes (1996) presented a revised version of the initial Hayes and Flower (1980) model. This new model reorganised and expanded the previous framework and drew a more comprehensive model of writing. Hayes considered two major dimensions as the task environment and the individual.

The task environment was revised to include the social and physical aspects involved in writing. Regarding the social aspect, during the writing process writers generally consider to whom they are writing (*audience*) or with whom (*collaborators*). Given that writing is a social activity, writers are expected to consider the reader's needs by setting communicative goals and trying to write to achieve those goals (Alamargot, Caporossi, Chesnet, & Ros, 2011; Holliway & McCutchen, 2004; Midgette, Haria, & MacArthur, 2008). Similarly, the collaboration between writers during composition has been shown to improve the quality of the writer's final texts (De Smedt & Van Keer, 2018; Yarrow & Topping, 2001; Wigglesworth & Storch, 2009). The other aspect, the psychical environment, also influences what is written. While composing, writers re-read the already written text (*text so far*) and, as a result, the writing environment changes. Finally, the tools that writers use to compose their texts (*composition medium*) affects both the product and the process (MacArthur, 2006).

With regards to the individual components of the writing process, Hayes (1996) included *motivation/affect component*, indicating that cognitive and affective factors such

as goals, predispositions, beliefs and attitudes influence writing (Bruning & Horn, 2000). Also, the *long-term memory* component was upgraded including access to knowledge about the topic, genre, audience and task schema. In fact, greater knowledge about how to write has been related to the composition of higher quality texts (Olinghouse & Graham, 2009). Regarding *cognitive processes*, they were reformulated as reflection, text production and text interpretation which are roughly similar to those of planning, translating and revising (Hayes & Flower, 1980). Given that these later terms are widely used and accepted within the writing research field, they will be used throughout the dissertation. Finally, the *working memory component* was included. Working memory also plays an important role in the writing process, as writers—especially novice writers—generally experience cognitive overload during writing (Kellogg, 2008).

Hayes (1996), further indicated that writing depends on an appropriate combination of cognitive, affective, social and physical conditions. Writing is a generative activity that requires motivation, but it is also an intellectual activity that requires cognitive processes and working memory too.

To sum up, the revised model proposed by Hayes (1996) included important revisions that provided a much more sophisticated and complicated view of skilled writing. The inclusion of working memory and motivation was an especially important addition (Graham, 2006). Both models—the original model of Hayes and Flower (1980) and Hayes' (1996) revision—clearly showed the complex nature of the composition process. However, they were too general, as both models failed to account for development or to provide insight about how novice and competent writers differ. This is an important aspect given that writing seems to be especially complex for young writers, as they should manage several writing processes while concentrating on more basic writing skills (e.g., transcription skills) which are not fully automatized yet (Bereiter & Scardamalia, 1987). These basic processes were not included in previous models as adult writers have already automated these processes. Since only things of which we are aware can be verbalised, these writers did not include verbalisations related with transcription skills. Given that the present dissertation focuses on upper-primary students, there is a need to revise the models of writing that specifically address how writing develops and the cognitive challenges faced by young students.

Developmental models of writing.

Bereiter and Scardamalia (1987) considered the need to develop a new writing model that would explain, in a developmental way, how skilled and less competent writers composed differently.

These authors argued that while novice writers tended to approach writing as a knowledge telling task, expert writers relied on a process that can be denominated as knowledge transforming. In the first model, knowledge telling, writers use a retrieve-and-write process by retrieving content from memory and translating it into sentences. The main concern is what to say next and results in writers simply telling all that they know about a topic. Thus, little attention is devoted to processes such as planning or revising. A frequent problem of the knowledge telling process is that texts typically lack enough content, are shorter and incomplete and, as a consequence, have lower quality (Graham & Harris, 2000, 2003).

The second model, knowledge transforming, indicated what more competent writers typically do. With knowledge-transforming, a writer transforms knowledge as a result of reflective thinking during writing. Writers rework their ideas into more fully developed thoughts. They may also define goals, construct a plan for writing, organise their writing and use strategies for finding and fixing problems in the text and for monitoring the entire process. There is continual revision and rethinking. The problem anticipation and resulting goals lead to plans for resolving the perceived problems. Scardamalia and Bereiter (1987) argued that knowledge transforming is not a universal process for all writers.

Despite the high value of this model, it does not provide enough information about how writing develops. Berninger and colleagues have argued the not-so-simple view of writing (Berninger & Winn, 2006; Berninger & Chanquoy, 2012) contributes to better understanding of writing processes and how they may change over development.

According to the not-so-simple view of writing, text generation is supported by the collaboration between low-level transcription skills, which include handwriting and spelling processes, and high-level cognitive skills, such as planning and revising (Berninger & Winn, 2006).

As writing requires written texts, transcription—the process and physical acts of representing sounds to written symbols (McCutchen, 2000)—is necessary. Lack of accuracy and fluency in low-level transcription skills constrains writing by interfering with higher-level processes, such as planning and revising (Graham, Berninger, Abbott, Abbott, & Whitaker, 1997; McCutchen, 2000; Olive & Kellogg, 2002). Therefore, transcription skills need to be mastered early. The automation of transcription skills is a gradual process that takes place during schooling due to maturation and practise (Kellogg, 2008; Olive, Favart, Beauvais, & Beauvais, 2009).

Research findings on the use of high-level processes by novice writers, such as planning and revising, and their contribution to text quality are less clear. To the best of our knowledge, few attempts have been made to explore the effects of writing process on text quality with elementary students. Most studies have focused on exploring the ability of elementary school students to use different writing processes through the use of offline measures (e.g., through the analysis of writing outlines; Limpo & Alves, 2013a, 2013b; Limpo, Alves, & Fidalgo, 2014; Whitaker, Berninger, Jhonston, & Swanson, 1994). In those studies, students were asked to plan (advance plan) and write and revise a text (post-translating) in specific tasks implemented in a linear way under time limit constraints. Key findings suggested that despite advanced planning and post-translation revision skills seem to appear around the end of primary education, the use of these processes was not related to text quality (Limpo et al., 2014; Whitaker, et al., 1994). Although the studies cited above provide relevant information, the results should be interpreted in light of some considerations. In these studies, students were forced to pre-plan and revise. Therefore, it was not possible to know whether students would have pre-planned or revised spontaneously in their texts (Limpo & Alves 2013a, 2013b; Limpo et al., 2014). Students were also asked to plan, write and revise in a linear way. However, writing is not a linear process, as has been shown with adult writers (Hayes & Flower, 1980). Finally, none of the studies previously reported analysed the online management of writing processes. That is, how much time elementary school students devoted to different writing processes or the distribution of these processes during composition. These aspects have been shown to be related to the quality of the final text in adult writers and secondary school students (Beauvais, Olive, & Passerault, 2011; Levy & Ransdell, 1995). However, this kind of research is scarce with elementary school students. In order to advance the understanding of the writing process of young writers, an evaluative study was included in this

dissertation (chapter 3). In this study, we analysed how upper-primary school students use a broad range of writing processes, their distribution during composition, and the contribution of both aspects to text quality through the use of online measures, such as thinking aloud.

Given the complexity of writing sketched in this section, it is not surprising that writing achievement takes years to develop and that most students find it challenging (Kellogg, 2008). Fortunately, there is now a considerable body of evidence showing that, from very early on, the development of writing skills can be successfully enhanced through writing instruction, thereby resulting in extensive gains in students' writing performance. This evidence is mainly represented with the meta-analysis of writing instruction presented in the next section.

Revision of Writing Instruction Meta-Analysis

In recent years, there has been a growing interest in validating the effectiveness of different instructional approaches for the improvement of student writing competence. A valuable approach to identifying instructional practises that have the power to transform student writing skills is to conduct a systematic review of writing intervention research through meta-analysis. As Graham and co-workers have argued, meta-analyses are important in order to get a deeper understanding of how to teach writing (Graham & Harris, 2018; Graham, Harris, & Chambers, 2016). This kind of study provides an estimation of the magnitude and direction (positive or negative) of the effectiveness of different kinds of instructional approaches tested in a set of instructional studies through a common metric, the effect size statistics (Lipsey & Wilson, 2001). Therefore, from meta-analysis, it is possible to identify effective writing instructional practises across different student populations and educational levels or contexts, among other aspects.

In the writing research field, more than 20 meta-analyses have been conducted, including true- and quasi-experimental studies that have tested the effectiveness of a broad range of writing practises from grades 1 to 12 (Fidalgo, Harris, & Braaksma, 2018). These meta-analyses have been implemented across writing instruction for students with learning disabilities (see Gillespie & Graham, 2014; Graham, Harris, & McKeown, 2013), typical-development students (Graham et al., 2012; Koster, Tribushinina, De Jong,

& Van den Bergh, 2015) and upper grade students (Graham & Perin, 2007; Rogers & Graham, 2008).

A common result in all of these meta-analyses is that strategy-focused instruction is one of the most effective instructional approaches to improve student writing skills across different grades and populations (see Graham & Harris, 2018, for a meta-analysis of existing meta-analyses). Studies involving strategy instruction invariably yield large effect sizes with an average of 1.26 (Graham, 2006; Graham & Harris, 2018; Graham et al., 2012; Graham & Perin, 2007; Koster et al., 2015) compared with other instructional approaches used to improve student writing skills. Additionally, the impact of strategy instruction seems to be extremely robust given that its positive effects on student writing were maintained independently of the kind of student who received the instruction, the age of students, the cognitive process or strategy taught or the textual genre considered (Graham, 2006). It has resulted in improvements not only in student quality of writing but also in genre elements included in writing, knowledge of writing, approach to writing and self-efficacy (Harris & Graham, 2009; Wong, Harris, Graham, & Butler, 2003)

Strategy-focused instruction will be the main focus of the instructional studies included in the dissertation. In the next section, therefore, a detailed description of this instructional approach will be provided. The exhaustive description of its aims, theoretical bases and complex instruction sequence will provide the framework for the research line that will be addressed in the present dissertation.

Strategy Writing Instruction

Strategy instruction is a complex instructional approach that aims to help students develop metacognitive knowledge about writing and powerful cognitive writing strategies; encourage students to acquire self-regulation behaviour to monitor and manage their own writing process; and foster students' positive attitudes and motivation toward writing and themselves as writers (Harris & Graham, 2009; Harris, Graham, Mason, & Friedlander, 2008).

It is important to consider that strategy instruction is a broad term referring to different instructional programs. Strategy instruction can adopt a variety of forms (for a detailed review, see Fidalgo & García, 2007; Pressley & Harris, 2006; Robledo-Ramón & García, 2018). The most widely researched instructional program is the Self-

Regulation Strategy Development Model (SRSD; Harris & Graham, 1996). Large numbers of studies have corroborated the efficacy of this kind of instruction in North American schools (e.g., De La Paz & Graham, 2002), and it has been successfully adapted for typically-developing students in schools across several countries (e.g., Brunstein & Glaser, 2011, in Germany; Limpo & Alves, 2013b, in Portugal). However, other strategy-focused instructional programs have arisen and have been shown to be effective, such as the Cognitive Strategy Instruction in Writing Model (CSIW; Englert & Raphael, 1989); Strategy Content Learning (SLC; Butler, 1992); the Social Cognitive Model of Sequential Skill Acquisition (Schunk & Zimmerman, 1997; Zimmerman 2000; 2002); and Cognitive and Self-Regulation Instruction (CSRI; Fidalgo & Torrance, 2018). Despite the differences that can be found between these instructional programs, they share many similarities.

For example, regarding their theoretical bases, one key feature of this kind of intervention is the need to integrate multiple lines of research from multiple theoretical perspectives in order to create powerful interventions (Pressley, Graham, & Harris, 2006; Pressley & Harris, 2006). As these authors claimed, single theories are not able to provide a full understanding and capture the complex act of learning to write (Graham, 2006; Harris & Graham, 2009). Therefore, in general, strategy instructional programs are based on an integrative approach of different theories, mainly socio-cognitive and socio-cultural (Zito, Adkins, Gavins, Harris, & Graham, 2007). For example, four theoretical and empirical sources provided the foundation for the SRSD initial instructional model of writing in the 1980s (Harris, 1982, 1986: Harris & Graham, 2009; Harris, Graham, Brindle, & Sandmel, 2009). The first of these sources was the Cognitive-Behavioral Intervention model of Meichenbaum (1977). Its emphasis on the Socratic dialogue and its proposed stages of intervention influenced the SRSD instructional design (e.g., the inclusion of modelling or scaffolding), as well as the importance of dialogue during instruction. Second, the research of Soviet theorists and researchers (including Vygotsky, Luria, and Sokolov) on the social origins of self-control, the development of the mind and the zone of proximal development had a notable impact on the SRSD instructional model. Specifically, these theories influenced and contributed to the self-regulation and modelling components of the model. Third, the SRSD model has been strongly influenced by the work of Deshler, Schumaker, and their colleagues on the validation of acquisition steps for strategies among adolescents with learning disabilities (Deshler, Alley, Warner,

& Schumaker, 1981), steps that were also influenced by the work of Meichenbaum and others. Finally, the work of Brown, Campione, & Day (1981) on development of self-control, metacognition and strategies instruction was also foundational.

In accordance with the broad variety of theoretical models behind strategy instruction, the design of a global and complex instructional process was proposed as generally underlying strategy instruction intervention and was aimed at enhancing student skills, self-regulation, strategic knowledge, domain-specific knowledge and abilities, and motivation (Graham & Harris, 2005; Alexander, Graham, & Harris, 1998). The instructional sequences of such interventions typically involved the combination of different instructional components, such as direct instruction, modelling and collaborative practise, and different instructional content, such as declarative and procedural metacognitive knowledge linked to the textual product and the writing process, the use of cognitive strategies supported by mnemonics and self-regulation procedures (De la Paz, 2007). As an example, we will describe the SRSD instructional model in which six stages are considered that allow students to learn and apply writing strategies (Graham & Harris, 2005; Harris & Graham, 1996). These components or stages can be reordered, combined, modified and repeated, based on student needs. These phases or instructional stages are sketched in Table 1.

Table 1

Strategy-focused instructional stages

Develop and activate knowledge needed for writing and self-regulation
Read works in the genre being addressed (personal narrative, persuasive essays, etc.) to develop declarative, procedural and conditional knowledge and important vocabulary (*e.g., What is an opinion? What are the parts of a persuasive essay, are they all here? How do you think the author came up with this idea? What would you do? What might the author have done to help herself come up with all of these ideas? What might the author have done to organise the ideas? What might the author do when frustrated?*), appreciation of characteristics of effective writing (*How did the writer grab your interest?*), and other knowledge and understanding targeted for instruction. Continue development through the next two stages as needed until all key vocabulary, knowledge, and understanding is clear.
Discuss and explore both writing and self-regulation strategies to be learned; may begin development of self-regulation, introducing goal setting and self-monitoring.

Discuss it
Explore students' current writing and self-regulation abilities, attitudes and beliefs about writing, what they are saying to themselves as they write, and how these might help or hinder them as writers;
Graphing (self-monitoring) may be introduced, using prior compositions, which may assist with goal setting; graphing prior writing can be skipped if the student is likely to react negatively (performance during instruction is graphed);
Further discuss strategies to be learned: purpose, benefits, how and when they can be used or might be inappropriate (generalisation support); and
Establish students' commitment to learn strategy and act as collaborative partner; establish role of student effort and strategy use.
Model it
Teacher modelling and/or collaborative modelling of writing and self-regulation strategies, resulting in appropriate model compositions;
Self-instructions modelled can include problem definition, focusing attention and planning, self-evaluation and error correcting, coping and self-control, and self-reinforcement;
Analyse and discuss strategies and model's performance; make changes as needed;
Can model self-assessment and self-recording through graphing of model compositions; and
Continue student development of self-regulation strategies across composition and other tasks and situations; discuss use here and in other settings (generalisation support).
Memorize it
Though typically begun in earlier stages, require and confirm memorization of strategies, mnemonic(s), and self-instructions as appropriate; and
Continue to confirm and support memorization in following stages, make sure students have memorised the mnemonics and what they mean before independent performance.
Support it
Teachers and students use writing and self-regulation strategies collaboratively to achieve success in composing, using prompts such as strategy charts, self-instruction sheets, and graphic organisers (can initially use pictures with graphic organisers, then fade the pictures);
Challenging initial goals for genre elements and characteristics of writing established collaboratively with individual students; criterion levels increased gradually until final goals met;
Prompts, guidance, and collaboration faded individually (graphic organiser replaced with students creating mnemonics on scratch paper) until the student can compose successfully alone;

Self-regulation components not yet introduced may begin (typically, goal setting, self-instruction, self-monitoring and self-reinforcement are all being used by this stage; additional forms of self-regulation, such as environmental control and use of imagery, may be used as desired; and
Discuss plans for maintenance, continue support of generalisation.
Independent performance
Students able to use writing and self-regulation strategies independently; teachers monitor and support as necessary;
Fading of overt self-regulation may begin (graphing may be discontinued);
Plans for maintenance and generalisation continue to be discussed and implemented.

Note. Extracted from Harris & Graham 2009.

Componential analysis of strategy instruction.

Strategy instruction as a whole has been shown to be very effective to improve student writing skills as it was reported in the previous section. However, studies have necessarily evaluated the effects of a wide range of instructional content and components that are typically included in strategy instruction interventions. These components and content are coherent at a theoretical and pedagogical level with the theories on which strategy instruction is framed (Fidalgo & Torrance, 2018). However, it is difficult to identify whether all or just some of them are responsible for the positive effects of this kind of instruction on student writing skills. In this context, new questions have arisen about the effects of the different components and the content included in strategy instruction. This will be the main focus of the instructional studies included in this dissertation.

Several researchers have pointed out the need for componential analysis studies (Brunstein & Glaser, 2011; De la Paz, 2007; Graham & Harris, 1989). Such studies would be critical at both the theoretical and applied levels. From a theoretical point of view, the only way to understand how and why an intervention works is to analyse the contribution of each component and its effects on the outcomes (Hopwood, 2007). This would allow an understanding of the mechanism which makes strategy instruction effective. From an educational point of view, the complex and multicomponent nature of this kind of instruction makes its implementation in the schools under the regular curriculum problematic. Teachers may not only find problems in implementing such an approach

within inflexible school schedules, but may also have to manage complex instructional techniques that they do not normally use in their daily school practise, such as modelling. From the analysis of the effects of different content and components it would be possible to simplify the complex instructional sequence of this kind of intervention, thereby making more feasible its implementation in real classrooms (Fidalgo & Torrance, 2018).

According to this research line, some studies have attempted to pick apart the effects of different content and components typically included in strategy instruction interventions. These studies have focused on analysing the effects of different instructional components, such as peer support (De Smedt & Van Keer, 2018; Harris, Graham, & Mason, 2006; Holliway, 2004; Yarrow & Topping, 2001) or feedback (Duijnhouwer, Prins, & Stokking, 2012; Schunk & Swartz, 1993a, 1993b; Wong, Butler, Ficzere, Kuperis, Corden, & Zelmer, 1994), as well as different instructional content, such as motivation (Schunk & Swartz, 1993a, 1993b) or self-regulation (Brunstein & Glaser, 2011; Day, 1986; Glaser & Brunstein, 2007; Graham & Harris, 1989; Sawyer, Graham, & Harris, 1992). Given the broad range of components and content included in strategy instruction interventions, the instructional studies included in the dissertation (chapters four and five) will try to advance an understanding regarding specific aspects related to both instructional components and content.

Regarding instructional components, we will focus on the analysis of the comparative effects of two key components, direct instruction and modelling, in the improvement of upper-primary students' writing skills. With respect to content, we will focus on analysing whether instruction in revision processes brings additional benefits to upper-primary students as compared to instruction in planning processes. Additionally, we will explore whether upper-primary students need to be instructed in explicit revision strategies or if similar effects can be obtained through the promotion of students' reader awareness. In the next lines, we will provide a review of those studies which have served as the theoretical and empirical framework for the development of the instructional studies previously mentioned.

Regarding the instructional components, there are different studies focused on analysing the comparative effects of direct instruction and modelling as two key components of strategy instruction. Fidalgo and co-workers (2011) explored whether strategy instruction remained effective to improve writing skills if direct teaching is

removed in the full instructional sequence with upper-primary students. For that purpose, the authors designed two experimental conditions. The difference between them was that students in one condition were instructed by following the complete strategy-focused instructional sequence which involved direct teaching, modelling and collaborative and independent practise, while in the other condition, the direct teaching component was omitted. The results showed that both experimental conditions outperformed the control group in text quality, with no significant differences between the two experimental conditions. These results suggest that the direct instruction component does not seem to affect the overall effectiveness of strategy instruction. On the other hand, Sawyer et al. (1992) assigned fifth and sixth grade learning-disabled students to four conditions (full strategy-focused instruction, strategy-focused instruction without goal setting and self-monitoring, direct teaching and practise control). Normally achieving (NA) peers served as a social validation condition. In the direct instruction condition, the authors removed modelling and collaborative practise, and also instruction on the use of self-talk. The results did not show significant differences between conditions concerning text quality at any measurement occasion at either post-test or delayed post-test. Therefore, direct instruction itself seems to be sufficient to improve writing skills in terms of writing quality, at least for students with learning disabilities working in small groups.

Concerning the contribution of each component in the global instructional sequence, we need to consider the study of Fidalgo, Torrance, Rijlaarsdam, Van den Bergh and Alvarez (2015). These authors used a complex design with three six-grade classes, in which a lagged-group and cross-panel design were combined to test the effectiveness of a series of four instructional components on two genres. Different from other studies, the first component was observation and group reflection on a mastery model followed by three components, those of direct (declarative) instruction, peer feedback and solo practise. All experimental groups showed substantial gains compared to the control condition regarding product quality, but the most interesting result was that the effects were associated almost exclusively with the modelling and reflection component, with no significant additional improvement following any of the other components. This finding was replicated in two groups for compare-contrast essay genre and one group for opinion essay. These results suggest that observation of a mastery model followed by a whole-class discussion (reflection) is sufficient to improve writing skills. Nevertheless, this finding should be interpreted cautiously. It might be that ‘the

first blow is half the battle'. That is, we do not exclude that starting with direct instruction would have resulted in the same effect. Modelling was also linked to self-reflection, where somehow the strategy could be made explicit. As the authors stressed, a direct comparison of the benefits of these two forms of instruction is necessary for practical reasons and should be addressed.

In this context, in which different results have been found on the effectiveness of direct instruction or modelling, the second study of the dissertation is framed (chapter four). The goal in this study, therefore, was to directly compare the contribution of direct instruction and modelling to writing development, through interventions aimed at improving text quality by teaching planning and drafting strategies. Through this direct comparison, we could determine the effects of both components, thereby overcoming the research gaps identified in previous studies. For example, in the present study, modelling consisted just of the observation of a model without any kind of reflection after the observation, contrary to previous studies (Fidalgo et al., 2011; Fidalgo et al., 2015). However, this allowed us to explore the effects of the modelling itself, avoiding the interference of the whole-class reflection. That is, students just learned from their own observations and not from their classmates' reflections.

Regarding instructional content, according to the general and developmental cognitive models of writing (Berninger & Winn, 2006; Hayes, 1996), under strategy instruction students are typically instructed on planning and revising processes. A broad range of intervention studies have shown that instruction on planning (De la Paz & Graham, 1997; Graham, Harris, & Mason, 2005; Harris et al., 2006; Tracy, Reid, & Graham, 2009), revising (De la Paz & Sherman, 2013; Fitzgerald & Markham, 1987; Sherman & De la Paz, 2015; Stoddard & MacArthur, 1993; but see Graham, 1997) or a combination of both processes (Brunstein & Glaser, 2011; De la Paz & Graham, 2002; Englert, Raphael, Anderson, Anthony, & Stevens, 1991; Saddler & Asaro, 2007; Torrance, Fidalgo, & García, 2007; Wong, Hoskyn, Jai, Ellis, & Watson, 2008) enhances elementary students' writing competence. However, these studies do not allow us to know whether the instruction on both processes contributed similarly for the improvement of elementary student writing skills for two reasons. First, experimental conditions in which students have been instructed on planning or revising processes have been, in general, compared with control conditions that have involved mainly business-as-usual instruction or instruction that was unlikely to improve student writing performance on the basis of

previous studies (e.g., Cho & MacArthur, 2011; Fidalgo et al., 2015; Fitzgerald & Markham, 1987). Second, intervention studies in which students have been instructed on both processes (planning and revising) have not provided separate results for the effects of the instruction in each of these processes. Therefore, it is unclear whether the instruction for both processes contributed similarly for the improvement of student writing competence.

Given that pre-planning seems to emerge before revision (Berninger & Swanson, 1994), it is questionable whether revision instruction for upper-primary students produces benefits above and beyond planning instruction. In fact, this is what Torrance and colleagues (2007) argued when they found that, despite the positive effects of instructing sixth-grade students (11–12 years old) in a combination of planning and revision strategies for the improvement of student written competence, such instruction only had an effect on student planning processes which were assessed by means of concurrent self-reports. This result was found even when more intervention time was devoted to revision than to preplanning. The authors claimed that the lack of effects of revision instruction on student revision behaviour can be explained by both cognitive-developmental and motivational reasons with sixth-grade students. From a cognitive-developmental point of view, revision involves both developing a representation of the meaning of the text from the perspective of the reader as well as a representation of intended meaning (MacArthur, 2012, 2015). Thus, it may be that cognitive resources required for maintaining both representations, the cognitive mechanisms required to juggle between them and cognitive processes are not yet available to sixth-grade writers. From a motivational viewpoint, there may be a negative trade-off between extensive preplanning and revision. If a student has spent considerable amount of time planning their text, they may be reluctant to undo that work by making meaningful changes to their text.

As far as we know, no study has attempted to explore whether instruction in revision resulted in benefits above and beyond instruction in planning in upper-primary students, which would reduce the broad content usually provided in strategy instruction. This framework lays the foundations for the theoretical justification of the second intervention study of the dissertation (chapter five). The study aimed to explore whether instruction in revision resulted in improvements to 6th grade student written composition as compared to instruction that taught students to set communicational goals for their text (planning instruction). This will provide information about the effectiveness of, and the

need for, instructing upper-primary students in both processes to improve their writing competence. Additionally, as a second aim of this intervention study, we will explore if it is necessary to instruct 6th grade students on explicit revision process strategies, or if similar results can be found following other instructional practises, such as the reader approach.

Several reasons can explain why young writers rarely revise their texts. An understanding of the reasons for limited revision in young writers is critical in designing instruction. Some authors have argued that elementary students should be instructed in explicit process strategies to successfully revise their texts given that these students often suffer from cognitive overload (Graham & Harris, 2018). Other authors have emphasised the need to promote students' audience awareness in order to enhance their revision skills, as elementary school students often have difficulties in taking their readers' perspective and see mistakes in their text (Pritchard & Honeycutt, 2006). Accordingly, strategy instruction on revision typically includes explicit instruction on revision strategies and the promotion of students' reader awareness (MacArthur, 2012, 2016). Both approaches have been shown to be effective (for reviews of both approaches, see Rijlaarsdam et al., 2008; Graham 2006; Graham et al., 2012); however, to our knowledge, no direct comparison of these approaches has been conducted. From this comparison it could be determined whether upper-primary students need to be instructed in explicit revision strategies or whether it might be more important to develop their audience awareness. Differences between these two approaches for the improvement of student writing competence, if found, would represent direct evidence of the benefits of one or the other approach. This could have implications for the content that should be included for the improvement of revision skills in upper-primary students.

Finally, not only componential studies are needed to better understand the effectiveness of strategy instruction. There is also a clear need to report interventions under complex instructional approaches, such as strategy instruction, in detail in scientific manuscripts. If strategy-focused interventions in writing research would be reported in specific detail, it would result in positive consequences from educational and scientific points of view. From an educational point of view, this will facilitate the transfer of scientific knowledge to the reality of the classroom. Only by providing all the necessary information for its implementation will teachers be able to use these practises with their students. It will also have implications at the scientific level, since it will allow the

advancement on developmental theories of writing as well as on instructional theories. Regarding developmental models of writing, it would be possible to know what variables play an important role if the content of the interventions (i.e., what is taught) is clearly explained. Similarly, if the mode of instruction (i.e., how it is taught) is specified in detail, it would provide information about the critical instructional elements which lead to specific outcomes.

Both the volume of Fidalgo, Harris, and Braaksma (2018) aimed to provide a detailed description and analysis of strategy-focused instructional programs and, specifically, the report system proposed by Rijlaarsdam et al. (2018) in one of the concluding book's chapters, framed the starting point of a special issue titled 'How to report instructional interventions in writing research' published in the *Journal of Writing Research*. Thus, the last study of this dissertation emerged as a contribution to this special issue (chapter six). In this study, we will report two similar interventions through the use of an adapted version of the report system proposed by Rijlaarsdam et al. (2018). This will allow us to explore the benefits or possible caveats of using a detailed reporting system of writing interventions and to provide a detailed comparative report of two effective interventions to improve upper-primary student written competence by promoting their revision skills. These interventions followed the same instructional sequence but varied the content according to two different approaches: the reader-focused condition and the strategy-focused condition. Instruction in the strategy-focused condition aimed to teach students explicit strategies for regulating their own revision behaviour. The instruction in this condition assumed that revision is a complex process that requires substantial metacognition and self-regulation (Bereiter & Scardamalia, 1987; Hayes & Flower, 1980; Zimmerman & Risemberg, 1997). Reader-focused instruction focused on providing students with the opportunity to observe and learn how readers respond to imperfect texts. This condition assumed that developing writers have difficulty in taking the perspective of their readers, something which is critical for effective revision (Bereiter & Scardamalia, 1987; Hayes, Flower, Schriver, Stratman, & Carey, 1987; Sommers, 1980). These interventions were those that were designed in the third study of the dissertation (chapter five).

Once the dissertation has been theoretically and empirically justified, both in general and specifically for each of the studies included in the dissertation, the chapter that follow will explain the aims that have guided the empirical studies included in the

dissertation as well as the method designed in each study to comply with the proposed aims.

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2 AIMS and METHOD

In this chapter, we will present both the aims that have guided the empirical studies included in this dissertation as well as the method followed in each study in order to achieve the proposed aims. This is done in accordance with the regulations established by the Doctoral Program in which this dissertation has been developed.

Before starting this chapter, it is worth mentioning that the aims included in this dissertation will contribute to two important research lines within the field of writing composition. One of them (study one) is focused on the analysis of upper-primary students' writing process through the use of online measures (Beck, 2018; Lindgren & Sullivan, 2019; Olive, 2009; Olive & Levy, 2002). The other line of research (studies two, three and four) focused on the componential analysis of the effectiveness of strategy instruction to improve upper-primary students' writing competence (Brunstein & Glaser, 2011; Fidalgo, Harris, & Braaksma, 2018; Fidalgo, Torrance, Rijlaarsdam, Van den Bergh, & Álvarez, 2015).

Finally, in order to facilitate the reading and provide a clear organization of the chapter, the aims and method will be presented according to each of the empirical studies included in the dissertation.

First Study: The Online Management of Writing Processes and their Contribution to Text Quality in Upper-primary Students (Chapter 3)

Aims of Study 1

The first study of this doctoral dissertation has an evaluative nature. The main aim of this study focuses on *analysing the online management of upper-primary students' writing processes and their relation with text quality through the use of online measures*. As was mentioned in the introductory chapter, this in an important consideration, as some researchers have shown that how and when undergraduate and secondary students engage in different writing processes has an impact on the quality of their final texts (Breetvelt, Van den Bergh, & Rijlaarsdam, 1994; Levy & Ransdell, 1995; Van den Bergh & Rijlaarsdam, 2001). However, this kind of study is scarce with elementary school students. This general aim can be broken down into three specific aims.

The first aim focused on *exploring how much time upper-primary students devote to a set of different writing processes, such as planning, translating and revising, and the related sub-processes*. Previous research has shown that writers differ in the time they spend on different writing processes through the use of online measures (Beauvais, Olive, & Passerault, 2011; Breetvelt et al., 1994; Kellogg, 1988; 2001; Levy & Ransdell, 1995; Penningroth & Rosenberg, 1995). However, these studies have been mainly conducted with undergraduate or secondary students. As far as we know, only two studies have tried to explore the time that upper-primary students devote to different writing processes by means of self-reported, on-line measures in the context of instructional studies (Torrance, Fidalgo, & García, 2007; Torrance, Fidalgo, & Robledo, 2015). However, this kind of on-line method has some disadvantages. First, the data came from the students' concurrent self-reports, which means that students were the ones responsible for identifying the process in which they were engaged in specific moments during the writing process. Arguably, this can be problematic for young students, and the data may lack reliability (Olive & Levy, 2002). Additionally, self-reports provide a limited scope for fine-grained analysis in terms of different writing processes, as students need to be instructed to recognize them. In the present study, and based on the review of the general and developmental models of writing, we considered as a key point the need to include a considerably more finely grained coding schema than those considered in previous studies. From our point of view, in order to provide a comprehensive analysis of upper-primary students' writing processes, it is important to consider not only the main writing processes, such as planning, translating and revising, but also writing sub-processes. Thus, for planning, we considered the goal setting, organization and idea generation sub-processes. Also, for revising, we considered the reading, mechanical evaluation, substance evaluation, mechanical editing and substance editing sub-processes. The differentiation between substantive and mechanical processes was also an important addition, since the impact of revisions on text quality seems to be mediated by their nature (Limpo, Alves, & Fidalgo, 2014). In alignment with the study aims, we therefore decided to consider the use of thinking aloud online measures. However, given that asking students to think aloud during writing is a strange and demanding activity for young students, it is likely to disrupt students' writing processes. Therefore, in the present study, we considered a novel alternative, in which students were asked to explicitly communicate their actions and thoughts to a partner during writing – that is, students wrote in pairs. This allowed us to use the thinking aloud procedure, but to make the

students' verbalizations of their actions and thoughts during writing easier and more natural.

The second aim focused on *exploring how the writing processes are distributed during composition*. Several studies have shown that writers not only differ in the time they spend on different writing processes, but also in terms of when they engage in these processes during composition (Breetvelt et al., 1994; Kellogg, 1988, 2001; Levy & Ransdell, 1995; Penningroth & Rosenberg, 1995; Piolat, Kellogg, & Farioli, 2001; Van den Bergh & Rijlaarsdam, 1999; 2001). However, all of these studies were conducted with undergraduate or secondary school students. From our knowledge, no studies have explored how upper-primary students distribute writing processes during composition.

Finally, the third aim focused on *exploring whether overall time in writing processes and/or distribution of processes across composition can predict the quality of the final text*. Previous studies have shown that the time spent on different writing processes or when writers engage in these processes during composition are related to the quality of their final texts (Beauvais et al., 2011; Breetvelt et al., 1994; Levy & Ransdell, 1995; Van den Bergh & Rijlaarsdam, 1999; 2001). However, no studies have tried to explore this issue in a comprehensive way with elementary school students.

From a theoretical point of view, this study would provide relevant information about upper-primary students' writing processes and their relation to text quality, which can be informative for developmental theories of writing. Additionally, from an applied viewpoint, the results of this study can serve to help us better understand the writing process of upper-primary students and to detect possible difficulties in their writing processes. Consequently, it could serve to aid in the decision-making process about what instructional approach could be more suitable to help these students to become proficient writers.

Method of Study 1

Sample.

The sample comprised 120 upper-primary Spanish students of the fifth and sixth grades (age ranged between 10-12 years) from six classes within the same school. Although students with learning disabilities participated in the study, their data was not considered for the analysis. Students were divided into 60 pairs as they were evaluated in

a collaborative writing task. Data for the participating students by grade is presented in Table 1.

Table 1

Data for the participating students by grade

	Grade	
	5th	6th
Total students	62	58
Gender		
Male	35	30
Female	27	28
Age (in years)		
M (SD)	10.47 (.50)	11.41 (.50)
Range	10 - 11	11 - 12

The writing instruction received by these students was similar to the general method of teaching writing that is followed in the Spanish educational context. This instructional style is focused on the features of different textual genres and on grammatical and spelling accuracy, without any kind of strategy instruction or the use of high-level processes in a self-regulated way (for a detail description of Spanish writing instruction, see García, De Caso, Fidalgo, Arias and Torrance, 2010).

Instruments and Measures.

Writing task.

Students completed an argumentative writing task in pairs in which they were asked to defend whether they were for or against a given topic. The topics provided were within the students' knowledge base, meaning that they did not need additional information to write about them (e.g., reading books or the captivity of wild animals in the zoo). Also, topics were evenly distributed, controlling for class and grade. For the writing task, students were provided with a draft sheet, the use of which was optional, and a final text sheet, the use of which was mandatory. Also, students were provided with digital pens. These digital pens were LiveScribe 2GB Echo Smartpens, which have a regular appearance but host an infrared camera at the tip, as well as an integrated microphone. The use of smartpens allowed us to collect the students' verbalizations during the writing process as well as the digital trace of what they were writing. Thus, the entire writing process of each pair was recorded. Given that the smartpens have their own

data storage, they were used in a whole-class context. Data were downloaded from the pens through the use of the Livescribe Desktop application (www.livescribe.com). From this application, we obtained a PDF file with the audio and the writing process of each pair.

On-line writing process measures.

For the analysis of writing processes, we first transcribed the verbal protocols. Then, the verbal reports were divided into segments, with each segment containing just one of the writing processes considered, in a coding system based on Hayes and Flower's (1980) writing model, which has been used in previous studies (Penningroth & Risenberg, 1995). Thus, the three processes which we considered were planning, translating and revision. Additionally, several sub-processes were considered within planning and revision processes themselves. With regards to planning, we included idea generation, organization and setting goals. For revision, we included reading, mechanical evaluation, substance evaluation, mechanical editing and substance editing. Table 2 presents the writing process categories that were used to code the think-aloud protocols and examples of thoughts related to these processes.

For the coding process, we used macros in Microsoft Excel. This allowed us to easily segment each verbal protocol into the different writing processes and sub-processes, as well as to calculate the time devoted to each process and sub-process, the percentage of time based on the total time of the task and the timecourse in which students engage in different writing processes.

Finally, to gauge the reliability of the coding scheme, two independent coders under blind conditions coded 1597 categorizations (20%) out of a total of 7897. Cohen's kappa was .94, thereby confirming the high reliability of the coding scheme.

Table 2

Coding scheme for the analysis of thinking aloud and examples

Categories	Subcategories	Examples
Planning	**Generating** Retrieving relevant information from the task environment and long-term memory. Brainstorming	*"I have a new idea… we can talk about…"* *"We can put something on…"* *"The books are very boring"* *"It is important to learn languages"* *"The animals have to live free"*
	Organizing Involves the organization of the information included in the text or when students talk about how to organize the content	*"We can put advantages and disadvantages"* *"We must put reasons to support our opinion"* *"First we can write our opinion and then say something about the topics"*
	Goal setting Elaboration of aims to be achieved in the text	*"I am going to make an introduction"* *"I need to make a good text"* *"You should write three paragraphs"*
Translating	Involves the verbalization or dictation of what students are writing	
Revising	**Reading** Reading of the written text	
	Mechanical Evaluation Refers to the act of evaluating mechanical aspects of the text (e.g., spelling, grammar, punctuation) without making changes	*"There you need to put a comma"* *"I think here is better point and followed"* *"Habitat is written with h?"*
	Substance Evaluation Refers to the act of evaluating the substantive aspects of the text (e.g., meaning or the organization of the information) without making changes	*"We have written many times the word"* *"That's not the word you want to put, change it to ..."*
	Mechanical Editing Involved the act of making changes to the text at a mechanical level (e.g., spelling, grammar, punctuation)	*When the writer adds a comma, delete a point, change one letter for another, etc.*
	Substance Editing Involved the act of making changes to the text at a substance level (e.g., meaning or organization of the information)	*When the writer changes the order of ideas, modifies the content of the text, makes changes that affect the meaning or structure of the text, etc.*
Others	Units that cannot be categorized in another section. Verbalizations that were unrelated to the writing task.	*"We have a mathematics exam, I haven't studied at all."* *"Do you know who likes Sara?"*

Text quality measures.

Additionally, texts were assessed holistically through reader-based measures, which involved assessing the structure, coherence and overall quality of the texts, using methods adapted from Spencer and Fitzgerald (1993). In Table 3, the items considered for each aspect are presented.

Table 3

Reader-based text quality measures

Measure	Description
Structure	*Rating ranging from 1 (lack of structure) - 4 (well structured)* ▪ Extent to which students create a global framework to present the topic and their opinion ▪ Use of different connectors between paragraphs and ideas ▪ Mentioned the main goal of the text and the thesis ▪ Use the typical parts of a text like introduction, development and conclusion
Coherence	*Rating ranging from 1 (incoherent) - 4 (entirely coherent)* ▪ Possibility to identify the main topic ▪ Clear development without digressions ▪ Clearly defined general context ▪ The inclusion of details ▪ Use of cohesion marks ▪ Fluent speech ▪ Conclusion
Quality	*Rating ranging from 1 (not suitable) - 6 (excellent)* ▪ Presence of a clear sequence of ideas ▪ Good global organization ▪ Suitable vocabulary ▪ Variety of interesting details ▪ Correct sentence structure, punctuation and spelling

All texts were evaluated independently by two raters under blind conditions in three different rounds (one per dimension). Inter-rater reliability (r) was high (Structure, .82; Coherence, .85; Quality, .92).

Procedure.

Students were evaluated by the doctoral candidate who had previous experience in the use of the assessment procedures considered in this study. Students were assessed collectively in a natural context within the regular Language and Literature classes, with around 20-25 students per class. Students were given a total of 50-55 minutes to complete the writing task. However, no students needed more than 30 minutes to complete the task.

The assessment session began with the experimenter explaining the writing task. Students had to write an argumentative text in pairs while thinking aloud. The pairs were formed by the ordinary Spanish Language teacher. Teachers were asked to form pairs of students according to two criteria. First, students in each pair should have a similar academic level in the Language and Literature subject. Secondly, students in the pair should had a good relationship with each other. Once the pairs were set up, each student

within the pair received a different role. One of them was in charge of writing the text while thinking aloud, verbalizing everything they did and thought before, during and after writing, even if it was not related to the writing task. The other student was in charge of helping their partner and providing them support in writing the best possible text. For the assignment of roles, teachers were asked to point out which student in each pair was more talkative. This student was chosen as the writer (i.e., the person who should think aloud during the writing task).

Before starting the assessment task, students performed brief thinking aloud training which aimed to familiarize students with this procedure. First, students observed a modelling in which the experimenter verbalized all her actions and thoughts while completing a crossword puzzle over the course of five minutes. During the modelling, students were asked to pay attention carefully to everything the instructor did and thought, as later they would have to do the same. Students were asked just to observe, avoiding any concurrent activity which could affect their attention. After the modelling, students were grouped in the pairs who later performed the writing assessment task. Likewise, a role (i.e., writer or helper) was assigned to each of the students, as was previously mentioned. Then, the students completed the crossword puzzle through the use of thinking aloud over the course of approximately five minutes. During this time, the experimenter asked students not to stop thinking aloud and encouraged them to do so when they stopped. Also, the experimenter supervised and ensured that the students' verbalizations were related both to their thoughts and to their actions. Once the students had become familiar with the thinking aloud task, the experimenter reminded them of the writing task. Thus, the experimenter asked students to write an argumentative text with each student exercising the role assigned to them.

Second Study: Effects of Direct Instruction and Strategy Modelling on Upper-primary Students' Writing Development (Chapter 4)

Aims of Study 2

The second study of this dissertation has an instructional nature. The main aim of this study, in line with the main research aim of the dissertation, was to *analyse the effects of two key instructional components of strategy instruction, such as direct instruction and modelling, for the improvement of upper-primary students' writing competence*.

Some attempts have been made to explore the contribution of direct instruction and modelling to improve elementary students' writing competence, and two key components are typically included under strategy instruction interventions as it was explained in detail in the first introductory chapter (p. 35). In brief, Fidalgo and colleagues (2011) found that strategy instruction with and without the direct instruction component was effective in improving normally developmental sixth-grade (11 – 12 years of age) students' writing competence, with no significant differences between both conditions. This means that the direct instruction component seems to be no necessary to ensure the positive effects of strategy instruction. However, Sawyer and colleagues (1992) showed that for fifth- and sixth-grade students with Learning Disabilities (LD), direct instruction by itself, without modelling and collaborative practice, was enough to improve upper-primary students' writing skills. Therefore, in contrast with the results found by Fidalgo and colleagues (2011), direct instruction without modelling seems to be sufficient to improve upper-primary students' writing skills, at least for students with LD. Finally, in a later study, Fidalgo and colleagues (2015) explored the cumulative effects of modelling, direct instruction and collaborative and individual practice for improving sixth-grade students' writing skills. The authors found that the greatest improvement in the quality of the students' textual compositions occurred after modelling, with no additional significant improvement after being instructed in the remaining components. This result suggest that observation of a mastery model followed by a whole-class discussion (reflection) is sufficient to improve normally achieving sixth-grade students' writing skills. However, it should be noted that students were first instructed in the modelling component, and the study does not exclude the possibility that having started with direct instruction would have resulted in the same effect. Also, modelling was linked to reflection, where

somehow the strategy was jointly constructed. Despite the high value of these studies, it is not possible to identify the comparative effects of modelling and direct instruction components on upper-primary students' writing skills. Therefore, a direct comparison of the benefits of these two instructional components is needed. This comparison would allow us to know not only if both components by themselves are sufficient to improve upper-primary students' writing skills, but also whether one component is more effective than the other in improving upper-primary students' writing competence.

From a theoretical point of view, this information would contribute to the development of learning to write theories providing relevant information about the underlying mechanisms of learning or writing skill acquisition. Additionally, from an applied perspective, the results of this study could provide information about which instructional components – modelling or direct instruction – could be more effective for the teaching of writing strategies by teachers in their real classrooms.

Method of Study 2

Design.

The study followed a quasi-experimental design in which six classes of fifth and sixth graders in primary education (students aged between 10-12) from the same school were randomly assigned to one of the two experimental conditions or the control condition, controlling for grade distribution. Both experimental conditions received strategy instruction focused on the acquisition of planning and drafting writing strategies, varying only the instructional component considered in each condition. In the Direct Instruction Condition, students were instructed explicitly on planning and drafting strategies supported by the use of mnemonics and graphic organizers. In the Modelling Condition, students observed the instructor model the use of the planning and drafting strategies, but without labelling them at any time. Students in the Control Condition were instructed to obtain knowledge about the main features of high-quality argumentative text through the analysis of model texts (good argumentative texts), without any kind of strategy instruction.

Writing performance was assessed before the intervention (pre-test) and immediately after the intervention (post-test). We implemented two tasks at each measurement occasion: an individual writing task and a collaborative writing task, in

which students wrote in pairs. In all assessment moments and during intervention, the argumentative task was the genre in focus. In Table 4, this design is presented.

Table 4

Intervention design of study 2

Classes	Pre-test	Instruction	Post-test
5ºA	O_1	Y_3	O_2
5ºB	O_1	Y_1	O_2
5ºC	O_1	Y_2	O_2
6ºA	O_1	Y_1	O_2
6ºB	O_1	Y_2	O_2
6ºC	O_1	Y_3	O_2

Note. $O_{1\text{-}2}$ Writing of two argumentative texts (collaborative and individual tasks); Y_1 Direct Instruction Condition; Y_2 Modelling Condition; Y_3 Control Condition.

Sample.

The sample comprised 133 upper-primary Spanish students of the fifth and sixth grades (ages ranging between 10-12 years) from six classes within the same school. Although students with learning disabilities participated in the study, their data was not considered for the analysis. Table 5 presents the data for the participating students by condition.

Table 5

Data for the participating students by condition

	Conditions			
	Direct Instruction	**Modelling**	**Control**	**Total**
Total students	45	46	42	133
Gender				
Male	23	25	22	74
Female	22	21	20	59
Grade				
5^{th}	22	26	24	72
6^{th}	23	20	18	61
Age (in years)				
M (SD)	10.48 (0.50)	10.75 (0.61)	10.62 (0.57)	10.62 (0.56)

Instructional programs.

Instruction in all conditions was delivered by one instructor to whole classes (this held true for all conditions). All instructional programs comprised two sessions which lasted around 50-55 minutes. These sessions also followed the same pattern in all conditions. During the first half of the session, students were provided with session-specific content, varying according to condition. In the second half, students practised in pairs what they had previously been taught or observed. Each student in the pair had a role. One of the students, the writer, was in charge of writing while thinking aloud. The other student, the helper, was in charge of helping their partner and providing support when needed. Below, we will describe the instruction in all conditions in detail.

Direct Instruction Condition.

In this condition, students were provided with direct instruction about planning (first session) and drafting (second session) writing strategies for argumentative texts, supported by the use of mnemonics and graphic organizers. The planning strategy, "TARE", was specifically designed for this study. Each letter of the strategy depicts one of the parts that students should take into account during the planning of argumentative texts. Thus, *T* means Thesis or the writer's opinion about the topic (for or against); *A* means Audience in order to take into account the targeted readers; *R* means Reasons to support the thesis; and *E* means Examples to show the reader the importance of the reasons given. The drafting strategy was "IDC", which represented the main parts that expository texts should include. *I* means Introduction, in which the writer should present the topic in an attractive way and establish a clear thesis; *D* means Development, where the students must write their reasons with examples in an organized and coherent way to support their opinion; and *C* means Conclusion, in which the students should reiterate their opinion, relying on the arguments given throughout the text. In each session, supportive material was provided for students which aimed to support student learning. In Table 6, a detailed description of each session is presented.

Table 6

Description of instruction in the direct instruction condition

Session	Focus of the instruction	Instructional techniques and strategies	Materials
Session 1 Planning strategy	Planning Process "TARE" strategy: Thesis, Audience, Reasons and Examples	- Previous knowledge activation about writing and planning - Importance of planning before writing - Direct instruction of the planning strategy TARE supported by the use of mnemonics and graphic organizers - Collaborative practice	Annex I: Planning strategy TARE Annex II: Example: planning of an argumentative text about tobacco
Session 2 Drafting strategy	Drafting Process "IDC" strategy: Introduction, Development, and Conclusion	- Previous knowledge activation about planning and drafting - Importance of drafting - Direct instruction of the IDC drafting strategy, supported by the use of mnemonics and graphic organizers - Collaborative practice	Annex III: Drafting strategy IDC Annex IV: Example: drafting of an argumentative text about tobacco

Modelling Condition.

In this condition, students were instructed in the same planning (first session) and drafting (second session) strategies as in the previous condition, but in a different way. The instructor began both sessions by explaining to students that they had to observe someone who was planning or drafting an argumentative text. The instructor emphasized that students had to listen quietly and to direct all their attention to the model's thoughts and actions during the modelling, because later, they would have to emulate what they had observed. Modelling presented a self-regulating approach to perform an argumentative writing task in which the instructor was setting goals, analysing the task and evaluating the steps implemented. In addition, the instructor included self-talk related to positive self-efficacy beliefs ("I can do it correctly"); expectations of success ("I am sure that I will get a high mark"); and the maintenance of the motivation and concentration ("It is boring, but it is worth the effort"). The instructor followed a detailed script, demonstrating through the modelling the steps that good writers should follow

during the planning or drafting of an argumentative text. However, these steps were not highlighted explicitly or labelled by mnemonics at any time, contrary to the Direct Instruction condition. Students had to observe the process as a whole and to infer the steps for planning and drafting processes. Table 7 presents a detailed description of the instruction provided in this condition.

Table 7

Description of instruction in the modelling condition

Session	Focus of the instruction	Instructional techniques and strategies	Materials
Session 1 Planning strategy	Exemplification of the Planning Process	- Previous knowledge activation about writing and planning - Importance of planning before writing - Modelling of planning process through the use of thinking aloud - Collaborative practice	Annex I: Example of planning an argumentative text about tobacco
Session 2 Drafting strategy	Exemplification of the Drafting Process	- Previous knowledge activation about planning and drafting - Importance of drafting - Modelling of drafting process through the use of thinking aloud - Collaborative practice	Annex II: Example of drafting an argumentative text about tobacco

Control Condition.

The two experimental conditions were contrasted with a control condition, in which students were taught about the features of good argumentative texts, but were not instructed on writing process strategies.

In this condition, students were instructed in examples of high-quality argumentative texts about the same topic (tobacco) which vary in their approach – students must be either for (first session) or against (second session). Each text was read two times. First, some students voluntarily read it aloud to the whole class. Then, each student read the text individually. After reading, students answered questions about specific features of structure and content (e.g., “What kind of text did you just read?” “What is the main topic of the text?” “Say at least one more reason someone could give

against tobacco"). Finally, the instructor initiated a whole class discussion about the text they read, its features, whether they agreed with thesis, and so forth. Table 8 presents a detailed description of instruction included in this condition.

Table 8

Description of instruction in the control condition

Session	Focus of the instruction	Instructional techniques and strategies	Materials
Session 1 Exposure to high-quality argumentative texts	Exposure to a high-quality argumentative text in favour of tobacco	- Previous knowledge activation about argumentative texts - Reading argumentative text - Model texts analysis - Collaborative practice	Annex I: Argumentative text and activities
Session 2 Exposure to high-quality argumentative texts	Exposure to a high-quality argumentative text against tobacco	- Previous knowledge activation about argumentative texts - Reading argumentative text - Model texts analysis - Collaborative practice	Annex II: Argumentative text and activities

Instruments and Measures.

Writing task.

The assessment involved students writing argumentative texts. Topics were counterbalanced across assessment tasks (i.e., collaborative and individual) and pre-test and post-test assessment moments. The topics were within the students' knowledge base, meaning that they did not need additional information to write about them. For the individual task, topics were "Playing sports" and "Learn languages". For the collaborative writing task, students wrote about "The captivity of wild animals in the zoo" or "Reading books". These topics were presented on small cards in which each of the topics appeared with the question "for or against?", along with two pictures related to the topics. In each assessment task, students were provided with two worksheets: one for planning, the use of which was optional, and one for the final text, the use of which was mandatory. For both tasks, students were provided with around one hour; however, no students needed more than 35-40 minutes to complete the task.

Text quality measures.

Texts from both the individual and collaborative assessment tasks were rated holistically through reader-based measures and analysed in detail to generate text-based measures.

Reader-based measures involved assessing the structure, coherence and overall quality of the texts, using methods adapted from Spencer and Fitzgerald (1993). These measures have shown a high degree of reliability in previous studies (e.g., Fidalgo et al., 2015; Torrance et al., 2015). These measures are the same as those considered in the first study (for a detailed description of these measures, see Table 3; p. 61 in this chapter). The inter-rater reliability (Pearson's r) average across assessment moments was high (individual task: structure, .83; coherence, .92; overall quality .90; collaborative task: structure, .80; coherence, .87; overall quality, .94).

Text-based measures focused on the presence of complex coherence devices within the text (i.e., structural ties, reformulation ties, argumentative ties and meta-structural ties). Inter-rater reliability was also high (≥ .90 across all measures and for both tasks). Table 9 presents the different complex coherence devices considered, with examples.

Table 9

Complex coherence devices

Ties	Description	Examples
Structural	Links that structure information	*First of all; on the one hand, on the other hand; later; then; until; the first, the second; at present...*
Reformulation	Links that present a part of the discourse in a different way	*That is, for this reason; since, because of, anyway, therefore,...*
Argumentative	Links that condition the argumentative possibilities of a part of the discourse in which they are included	*Actually; in fact; for example; in particular; some examples, such as (followed by examples), among them...*
Meta-structural	Part of the text that either anticipates the information that will be provided later, or summarizes what has been said previously in the text	*In this text I am going to talk about...* *Here are the reasons...* *On the basis of the above...* *To sum up…*

Procedure.

After the careful design of the study, the research team contacted schools in order to present them with the study and ask them for their collaboration. Thus, the author of this dissertation had a meeting with the school's headmaster, in which the study was explained in detail. Also, the headmaster was provided with a report explaining and justifying the study at a theoretical and curricular level, as well as the procedure to follow for the implementation of the study. Once the school agreed to collaborate, the families were informed in order to obtain their consent for the participation of the students in the study.

Finally, the schedules for the evaluation and instructional sessions were set according to the teachers, school and research needs. At the end of the study, all teachers received a detailed report with the results of their students.

Both the instruction and the assessment sessions were implemented by the author of this dissertation, who has training in education as well as previous experience in the implementation of the kind of instructional programs and assessment procedures considered in this study.

The assessment sessions were conducted in the whole-class context in two sessions. In the first assessment session, students wrote an argumentative text individually, whilst in the second session, they wrote an argumentative text in pairs. Finally, the instructional programs delivered in each condition were also implemented in the whole-class context within the time devoted to the subject of Spanish Language and Literature in the school timetable.

As fidelity measures, the instructor was provided with a detailed script of each session. Additionally, all sessions were audio recorded with the aim of ensuring that the intervention was delivered as intended in all conditions. Moreover, all the materials completed by the students were gathered in portfolios to ensure that all students had completed the writing assignments.

Third Study: Strategy Learning or Understanding Reader Response? An Evaluation of Two Approaches to Developing Sixth-grade Students' Writing through Revision Instruction (Chapter 5)

Aims of Study 3

The third study has also an instructional nature. In accordance with the componential analysis of strategy instruction, the general aim of this study was to *explore the contribution of different aspects, such as planning and revising, typically included in strategy instruction interventions for the improvement of upper-primary students' writing competence*. This general aim can be broken down into two specific aims.

The first specific aim focused on *exploring whether instruction in revision resulted in improvements to sixth-grade students' written compositions, over and above instruction that taught students to set communicative goals for their texts (planning instruction)*. Under strategy instruction interventions, students are typically instructed on both the planning and revising processes. A wide range of strategy-focused interventions has shown that instructing students on planning, revising or a combination of both processes is, in general, effective (for a review of strategy instruction interventions, see Graham, 2006). However, these studies did not allow researchers to explore whether instruction on both processes contributed similarly to the improvement of elementary students' writing competence. Given that revising seems to appear later than pre-planning (Berninger & Swanson, 1994), it could be that instructing upper-primary students on revision does not provide them with more benefits than instruction in planning. However, to the best of our knowledge, no study has yet attempted to explore the cumulative effects of instructing upper-primary students on planning and revision processes for the improvement of their writing skills.

Additionally, the second specific aim of the study focuses on *exploring if it is necessary to instruct sixth-grade students on revision process strategies, or whether similar results can be found following other instructional practices, such as the reader approach*. A strong general claim behind strategy-focused approaches to writing instruction is that students require explicit mental representations of writing strategies to effectively regulate their writing behaviour (e.g., Harris & Graham, 2018; however, see

also Torrance et al., 2015). Under this account, if explicit strategy instruction is omitted, students will not apply effective revision strategies to their own writing, as they will suffer from cognitive overload (Kellogg, 2008; MacArthur, 2012). However, some studies have shown that elementary school students in particular face several problems in considering their readers' needs, which is a critical aspect in revision (Holliway, 2004; Pritchard & Honeycutt, 2006; Rijlaarsdam et al., 2008). If we want students to revise, they must first detect any gaps in their texts according to their readers' needs. These approaches are focused on two of the main problems (i.e., cognitive overload and lack of audience awareness) that can explain why young children have problems revising their texts. In fact, given its importance, in strategy instruction interventions, students are typically instructed not only on revision strategies, but also to take their audience into account (MacArthur, 2012; 2016). However, to the best of our knowledge, no direct comparison of these approaches has been previously conducted.

From an scientific point of view, understanding the contribution of the different aspects typically included in strategy instruction for improving upper-primary students' writing skills would facilitate a theoretical understanding of how and why this intervention works. That is, it will provide insight into the underlying writing development theory (Sawyer, Graham, & Harris, 1992). Additionally, from an applied viewpoint, this study will provide information about the need to instruct upper-primary students on both planning and revising processes, as well as about the comparative effects of two different approaches to promote students' writing competence and revision skills. Therefore, this information can serve to reduce the broad set of content usually provided in strategy instruction, thereby reducing the length of time usually required for the implementation of such strategy instruction programs in ordinary classrooms settings.

Method of Study 3

Design.

The study followed a quasi-experimental design in which six classes of sixth-graders (11-12 years of age), three of which were from two schools with similar academic and socio-economic features, were randomly allocated within school to one of the three learning conditions: two experimental conditions and a control condition.

Students in all conditions were initially instructed in the same planning strategy to set communicative goals. This remained the main focus of instruction in the control condition. However, in the other two experimental conditions, students were additionally instructed in the revision process, but following two different instructional approaches. In the Reader-focused condition, students observed the reading and understanding process of an intended audience, reading and trying to comprehend a text through the use of thinking aloud. In the Strategy-focused condition, students observed a writer applying a specific revision strategy supported by mnemonics – while thinking aloud – to guide students in their revision process.

Students' text quality and revision skills were assessed before the beginning of the intervention, immediately after the instructional period and two months later to assess long-term intervention effects. Additionally, after the end of the intervention, students completed a writing task for assessing transfer effects to an untaught genre. Text quality was assessed by means of reader-based measures in which several aspects, such as goal orientation, structure, audience focus and language use, were considered. Revision performance was assessed by a task in which students were asked to detect and solve different mechanical and substance problems included in a researcher-designed text. The design of the study is presented in Table 10.

Table 10

Intervention design of study 3

Classes	Pre-test	Instruction	Post-test	Transfer	Follow up
6ºA	O_1	Y_1	O_2	P_1	O_3
6ºB	O_1	Y_2	O_2	P_1	O_3
6ºC	O_1	Y_3	O_2	P_1	O_3
6ºA	O_1	Y_2	O_2	P_1	O_3
6ºB	O_1	Y_3	O_2	P_1	O_3
6ºC	O_1	Y_1	O_2	P_1	O_3

Note. $O_{1\text{-}2\text{-}3}$ Writing of an argumentative text and revision task; P_1 Writing of an instructional text; Y_1 Control Condition; Y_2 Reader-Focused Condition; Y_3 Strategy-Focused Condition.

Sample.

The sample comprised 107 sixth-grade students (aged 11-12 years) from six classes within two schools with similar academic and socio-economic features. Students with diagnosed special educational needs and students who did not complete both pre-

and post-test tasks were not included in this sample. Table 11 presents the sample features by condition.

Table 11

Sample features of study 3 (Mean, (SD), number of participants, percentage of female students per condition)

	Reader-Focussed		Strategy-Focussed		Control	
	School 1	School 2	School 1	School 2	School 1	School 2
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
Mean age in months (SD)	160.3 (3.33)	160.5 (4.01)	160.2 (2.62)	161.9 (4.99)	160.1 (2.82)	159.8 (3.67)
N (% female)	18 (61%)	19 (42%)	18 (44%)	19 (58%)	15 (47%)	18 (56%)
Total	37		37		33	

Instructional programs.

All instructional programs were applied over four sessions, lasting for 50-55 minutes, with each session implemented in four consecutive weeks. The instructional pattern was similar in all conditions: students received specific instruction followed by writing practice, according to the aims and contents included in each condition.

In all conditions, students were initially instructed on the same planning strategy to set communicative goals, called "INCA". This strategy was specifically designed for this study. Each letter of the strategy (in Spanish) represents one of the four steps that students should consider to set their goals. Thus, "*I*" means introduction (e.g., goals "*I need to introduce the topic in an attractive way to keep the attention of my audience*"); "*N*" (*Nudo* in Spanish) means development (e.g., goals "*I am going to write every reason with a clear example to convince the audience*"); "*C*" means conclusion (e.g., goals "*I am going to remind my parents what my thesis is*"); and "*A*" (*Aspecto* in Spanish) means form (e.g., goals "*I need to use paragraphs to make reading comfortable to the audience*"). Subsequently, instruction in the three conditions varied according to the approach followed.

Reader-focused condition.

In this condition, the instruction focused on developing the students' understanding of how readers respond to imperfect texts, through modelling instruction

of a reader reading a text and commenting on limits, gaps and mistakes, combined with encouragement to make changes to improve text quality.

In the first session, students were provided with a metacognitive revision matrix in which information about what, where and when to use the revision process was presented, with the aim of introducing students to this process. Then, the instructor stressed the necessity of taking into account the readers' needs during revision, making students aware of the fact that on many occasions, their texts could not be understood well when other people read it. Subsequently, the instructor introduced the students to the modelling task. She explained to the students that they were going to see a person thinking aloud while reading an argumentative text written for a child. Before the modelling task began, students received a worksheet to carefully read the communicative goals set by the writer before writing their text through the use of the previously taught INCA strategy. Then, the task set to the students was to observe and pay careful attention to the model's thoughts – what things the reader liked or disliked, what she did not understand and why, and so forth – when reading an imperfect argumentative text. It is important to note that during the modelling task, students focused exclusively on observing the model, without any other concurrent task like making notes. During the modelling, the model's thinking aloud stimulated revision behaviour through the introduction of different remarks to stimulate not only the evaluation of the content, but also specific types of revision activities, such as adding, deleting, changing or reorganizing (e.g., *"Oh, you use the same word a lot of times, and it is boring…you could use another word like…"*). After the modelling, students had the opportunity to list notes in a worksheet specifically about things that the reader had been highlighting positively and negatively during the reading of the imperfect text, as well as the suggestions provided by the reader to solve these issues. This information was later discussed in a whole-class discussion. In order to ensure and strengthen students' learning, at the end of the session, students were assigned homework. At home, students had to set communicative goals through the use of the INCA strategy and write a text about the topic of "Having pets at home" for their parents.

The second and third sessions were similar to each other. After the activation of the knowledge of the previous sessions, students could again observe a model trying to comprehend an imperfect argumentative text and reflect on it. This was done in the same conditions as in the first session. Then, students worked in writer-reader pairs, collaboratively revising their homework texts. The pairs were constructed by the usual

Language and Literature teacher, with students with broadly similar abilities in this subject being matched together. Students were asked to revise the homework text of the student who had the writer's role. The writer was in charge of revising their text while thinking aloud, trying to identify and resolve possible mistakes. The specific task set for the helper was to act as an external reader of the text and help the writer to discover all the kinds of mistakes or to identify things that could not be understood easily or that did not fit well with the evaluation criteria provided during the modelling. First, the pair worked together on the revision phase, each of them with the specific role, and then the writer wrote the final version while thinking aloud, taking into account the revisions made during the practice with the support of the helper. At the end of the sessions, all students reflected on key issues taught in the session, which were mainly focused on the importance of taking into account the reader's needs when writing and revising. Between sessions two and three, the students switched the writer and helper roles.

In the last instructional session, students practised individually. Therefore, after the activation of previous knowledge, the instructor introduced a revision task. In this task, students were asked to individually revise a researcher-created text. To create a "child-appropriate text" with typical problems face by this age group, the researcher had read several texts from the previous tasks and extracted the common problems from them. Issues were related to mechanical mistakes, content and organization problems and comprehension issues. Therefore, the instructor told students that they should revise a text written by a child similar to them about the topic of "Living one year abroad". Also, due to the importance and necessity of setting communicative goals, students should first read the communicative goals set by the writer and then read their first draft, trying to identify possible mistakes or things that do not sound good according to what they have learned during the previous sessions. Finally, students wrote the final version of the text, taking into account their revisions. The task lasted about 30 minutes. The students then received the final text as revised by an expert reviser. Thus, the student read a "model" text, which they could compare with their own final text. Finally, in a whole-class discussion, students were invited to discuss the elements they revised in their texts related to the "model" text, as well as the importance of writing well and specifically of revising and taking one's readership into account.

Strategy-focused condition.

In this condition, the instructional program focused on the development of revision skills through instruction on an explicit revision strategy to guide students in the revision process.

The pattern in the first session was similar to the instructional pattern followed in the previous condition, but it varied the way that students were instructed on the revision process. After activation of previous knowledge about writing and revision in the same way as the reader-focused condition, students were instructed directly in a specific revision strategy supported by the mnemonic "PIENSO" (in English "to think"), a prompt which guides students in their revision processes. Each letter depicts the steps that writers should take into account when revising their texts. Therefore, P means *main goals* (in Spanish *plan inicial*), related to the revision of the initial communicative goals set through the use of the INCA strategy; I means *Ideas* to revise, that is, whether the ideas are suitable for the audience and written in a understandable way, with an effort made to avoid repetitions, etc.; E means structure (in Spanish *Estructura*) in order to consider whether the text contains the main parts, like the introduction (in which the topic and thesis are presented), development (where the reasons and examples should be written) and conclusion (in which the writer must reiterate the thesis and offer a final comment), the use of different paragraphs for the main parts and the use of good examples for each reason, etc.; N means *connectors* (in Spanish *Nexos*), in relation to the use of different links between sentences and paragraphs throughout the text; S means *Syntax*, in relation to the sentence structure accuracy; and O means *Orthography*, which refers to grammar issues. In order to support the teaching of the strategy, students received a worksheet which outlined the PIENSO strategy. The instructor then prepared students for the modelling task by stressing the need to pay careful attention to the model while she applied the PIENSO strategy to revise an imperfect argumentative text. As in the reader-focused condition, students first carefully read the communicative goals that the writer formulated on a worksheet following the INCA strategy. Then, students could observe the modelling focused on the use of the specific revision strategy PIENSO, and subsequently take notes and have a whole-class discussion (as in the reader-focused condition). Finally, students were provided with the same homework task as in the previous condition, which involved the use of the INCA strategy to set communicational goals and to write an argumentative text.

The second and third sessions again followed the same instructional pattern as in the reader-focused condition in terms of instructional components (i.e., modelling, reflection and pairs practice), but they were focused in the use of the PIENSO revision strategy. Therefore, in this condition, students again observed the model applying the PIENSO strategy to revise an imperfect argumentative text. Additionally, during the pairs practice phase, the writer was in charge of revising their text while thinking aloud through the use of the PIENSO strategy, while the helper guided the writers' process with the revision strategy. Students' roles were alternated across the second and third sessions.

In the last session, students could practice individually in exactly the same way and with the same revision task as the reader-focused instruction. The difference was that in this condition, the PIENSO strategy was the object of practice.

Control condition.

The instruction in the control condition focused on setting communicative goals as a first crucial step to write the final text, and refrained from any kind of instruction in the revision process. The students were instructed to set communicative goals through the use of the INCA strategy, like in all conditions, which was the main focus of the instruction in the following sessions.

Throughout the sessions, students completed several activities to set communicative goals, mainly related to the reading of short argumentative texts and answering questions about the texts' content and organization, so as to evaluate from the text whether the goals set by the writer were achieved. To ensure all groups had the same amount of training, students in the control condition had the same homework as their peers in the experimental conditions. Moreover, in the second and third sessions, students were provided with the same opportunities to practice in pairs as in the two other conditions, but with different tasks. The tasks focused on the establishment of communicative goals and writing without any revision activities, which represents the fundamental difference between the practice in the control conditions and the two experimental conditions. In the second session, the practice involved each pair trying to find a topic to convince their teacher about something important for them (e. g. more sport in the school, less homework at home, etc.), and to establish the communicative goals for the text. In the third session, each pair wrote the final text based on the communicative

goals outlined in the second session. The writer was in charge of setting the goals and writing the text while thinking aloud through the use of the INCA strategy. The helper's role was to help their partner to set communicative goals and to write a good text, following the previous communicative goals set in the second session. Finally, in the last session, students practice individually. Thus, they established communicative goals and wrote a text about the topic "Living abroad for an academic year".

Instruments and measures.

Writing tasks.

The assessment involved students writing argumentative texts. Students were asked to write a text to sway the instructor to their opinion about a certain topic. Topics corresponded with interesting issues for students at this age group, such as "Reading", "Animal captivity" and "New technologies", followed by the question "for or against?". These three topics were counterbalanced across the three measurement occasions (pre-test, post-test and follow-up) to avoid effects of the topics on measurement occasions.

Students also complete a transfer task to assess generalization effects of the intervention on an untaught genre. For this task, students wrote in the instructional genre, which requires a strong audience-oriented approach. They had to write a brief manual to set up a simple experiment designed for primary education students called "ice crystals". They had to write this manual so that any classmate would be able to perform the experiment without problems, just by reading the manual. Therefore, the manual should contain an explanation of the goal and the general procedure, as well as specific and clear instructions on how to perform the experiment. To avoid differences in text quality derived from understanding or knowledge of the experiment, the students were provided with a worksheet that contained information about the materials needed for the experiment and four pictures, each depicting one of the four main steps of the experiment. Below each picture, two or three words (mainly verbs) were added to guide and support the writers. The instructor introduced the task, gave the students the work sheet and explained the experiment to the whole class, giving information about the goal of the experiment, the procedure and, specifically, the development of each step and issues that could arise.

At all measurement occasions, students were provided with three separate sheets of paper for (1) planning for the written outline; (2) rough work where students can write the first draft of their text; and (3) the final product, in which students should write the final text. A brief oral explanation about the use of the sheets of paper was provided to the students, and students were told that they were free to use the planning and rough worksheets if they wished, but that they were not required to do so. The use of the final product sheet was compulsory.

Text quality.

Rating scales with anchor texts were used for the evaluation of argumentative texts written in pre-, post- and follow up-assessment moments. To construct rating scales with anchor products for the evaluation of argumentative texts, the procedure by Van den Bergh and Rijlaarsdam (1986) was considered. The three phases followed to construct the rating scale are presented below:

1. Dimensions considered in the rating scale. Four aspects for communicative texts were considered: (1) goal orientation, in relation to the writer's position on the issue (e.g., the text contains a firm position concerning the discussion or content elements that increase the effects of the argumentation, such as like good reasons and representative examples, etc.); (2) audience, regarding to the way in which the writer establishes a relationship with the reader (e.g. anticipating objections, attractive introduction and clear structuring, etc.) and includes content elements addressing the reader's concerns; (3) structure, in relation to the way the content is organized, focusing on composition, a coherent relationship between sentences and paragraphs, the use of different kinds of connectors and formal structure and layout; and (4) language and style, in which sentence structure, vocabulary and language use were considered. For each of the aspects, a separate rating scale was developed.

2. Selecting standard anchor text. With the aim of familiarizing the raters with the rating criteria, these raters assigned scores to a small random sample (n=5) for each dimension. The scores were compared and discussed among the raters, and the rating criteria were clarified by the researcher when it was necessary. Also, to have a fixed reference point, the raters decided upon a medium-quality text for each dimension. Agreement on the average text was achieved by a discussion of the quality of the five

texts among the raters for each dimension. Thus, the final medium-quality text for each dimension was arbitrarily assigned 100 points and accompanied by a detailed description of each text representing the medium quality of each dimension.

3. Creating a dimension with anchor texts. Raters assessed two sets of twenty-five texts. These texts were selected randomly from all conditions and measurement occasions. To assess these texts, raters used the anchor essay as a reference point. The raters classified the texts into five piles to indicate the degree to which the rated texts were better, much better, worse or much worse than the anchor text. Raters then discussed the disagreements in the piles. Subsequently, they scored the texts individually, providing a score ranging from 70-130. No further instructions were given on the score distributions. The raters were free to use a range of scores.

The reliability of the scores was determined. The inter-rater reliability was good for 50 texts (Goal orientation .83, Audience .90, Structure .93, and Language and style .93). Thus, the agreement was considered good to use the scores as a reliable source to select anchor texts.

To establish the series of anchor texts, texts were selected around the score points of 100 (average mark), 85 (-1 SD), 70 (-2 SD), 115 (+1 SD) and 130 (+2 SD), on the basis of the agreement between the raters. Therefore, to be chosen as an anchor, an essay had to represent one of the five score points listed above, and the scores given to this essay by the raters had to vary as little as possible. Each anchor text was presented with a description of its features. The same procedure was followed for the selection of anchor texts for the transfer task, in which the same dimensions were considered.

The two trained researchers, blind to conditions, rated all texts, using the series of anchor texts, descriptions of dimensions and descriptions of the qualities of the anchor texts. They rated the texts in four rounds, with one per dimension. Inter-rater reliability (Pearson's correlation) indicated good reliability for the argumentative genre (Goal orientation = .89; Audience = .80; Structure = .90; Language and style = .85), as well as for the transfer task (Goal orientation = .87; Audience = .83; Structure = .92; Language and style = .84).

Revision measures.

To assess students' revision skills, students were asked to revise a provided argumentative text. We decided that the students should revise a text provided by researchers because textual quality influences the revision. Therefore, if students review their own texts, the textual quality will differ – not necessarily because they revise differently, but rather because of the initial quality of their texts. Thus, if students start from the same text, the differences between them can then be attributed to how much or what they revised (for a methodological discussion on the study of revision, see Butterfield et al., 1994).

Therefore, three revision tasks were designed by the researchers, which were counterbalanced between the different assessment moments. It is important to note that it was carefully checked that all texts were as similar as possible in terms of topic difficulty, text length (approx. 400 words) and the inclusion of the same number and kinds of errors. Thus, in those texts, we implemented two types of problems which were aligned with the aims of the revision conditions: six mechanical errors (i.e., spelling, punctuation and syntax errors) and six substance problems (i.e., missing information, out-of-sequence sentences and lack of important structure elements). First, the students were asked to read the text carefully, mark anything in the text that did not sound good or that could be improved and to assign a number to each "mistake". Second, the students filled in a table to write that number, to explain the error in the text and provide a possible solution. The final scores were for the total number of errors accurately detected and corrected for mechanical and for content issues (α mechanical issues = .81; α substance issues = .74; α detection = 70; α correction = .70), respectively.

To assess inter-rater reliability, 30% of the revision tasks, distributed across condition and assessment moment, were scored by a second rater. Mean inter-rater agreement, across the four measures, was .98, with a minimum agreement of .96.

Procedure.

After the design of the study, the researchers contacted the headmasters of schools in order to ask them for their collaboration in the implementation of the study. In order to provide all the information related to the study, a meeting was arranged with the headmasters of the schools. After the schools agreed to collaborate, parents were

informed of the research aims via letters in which they gave written informed consent. They were given the opportunity to express concerns and to request that their children's data not be included in the study. The study was then conducted. After finishing the study, the school was informed about the results of the students in all classes.

The instruction and assessment in all conditions were delivered by the author of this dissertation. She has an educational degree and teaching experience in schools. Additionally, she has had previous experience in the implementation of the assessment task and instructional procedures included in the present study. The instruction and assessment sessions took place during the scheduled language lessons and were applied to the whole class.

The assessment sessions were applied over two consecutive sessions. In the first session, students wrote an argumentative text, while in the second session, they completed the revision task. It is noteworthy that before the pre-test period, students in all conditions received two sessions delivered by researchers lasting 55 minutes each, in which they were provided with information about features of argumentative texts and then practised argumentative writing. This was done in order to ensure that students were familiar with the basic features of argumentative texts, thus reducing the low scores of students in the pre-test as a consequence of writing about a textual genre which is unfamiliar to them.

To ensure the proper implementation of interventions, the content of each session was carefully prescribed, and all sessions were audio-recorded. Also, for the modelling, the researchers created a detailed script to follow during the modelling task to ensure all classes received the same kind of information. In addition, each session included specific assignments that required written output, which were collected in portfolios. These portfolios were analysed after the intervention to assess fidelity. It was found that all tasks had been completed by all students in all conditions.

Fourth Study: How to Report Writing Interventions? A Case Study on the Analytic Description of Two Effective Revision Interventions (Chapter 6)

Aims of Study 4

The fourth study of the doctoral dissertation has a descriptive nature and was part of a special issue published in the *Journal of Writing Research* about how to report writing interventions. According to the special issue topic, the study was designed with two main aims.

The first aim focused on *providing a report system, which can be feasible to use in scientific manuscripts, in which writing interventions are explained in detail at both the content and instructional design levels*. This is an important special issue, given that in general, writing interventions are described rather broadly in scientific manuscripts, thereby making it difficult to gain insight into the crucial components determining the effectiveness of the interventions (Fidalgo, Harris, & Braaksma, 2018; Graham & Harris, 2018; Rijlaarsdam, Janssen, Rietdijk, & Van Weijen, 2018). The content level would be related to the intermediate learning objectives, understanding them as the design of what skills or knowledge should be achieve by the students, and in what order that process should occur. The instructional design level, on the other hand, refers to the design principles, learning and instructional activities implemented in a study in order to achieve the proposed intermediate learning objectives. The description of writing interventions according to these two complementary dimensions would have theory-building implications. If intermediate learning objectives were specified, it would allow researchers to evaluate whether those specific aims have been met after or during the instructional treatment to support a theoretical understanding of how and why writing interventions work. Understanding the relative contribution of the different skills or knowledge on the related results will give insight into the underlying writing development theory (Sawyer et al., 1992). It is important to consider that developmental theory building is especially relevant in ill-defined domains such as writing, in which several approaches and theoretical models have arisen to better understand writing (see the reviews by Alamargot & Chanquoy, 2001; MacArthur, Graham, & Fitzgerald, 2016). Moreover, it would also contribute to the development of theories of learning to write.

The detailed description of the instructional design for the achievement of a specific intermediate learning objective would allow researchers to explore the relationship between the proposed learning outcomes and the learning and instructional activities chosen to achieve them, as well as its effectiveness in various combinations. Therefore, it would provide relevant information about the underlying mechanisms of learning and writing skill acquisition in various learners under a variety of conditions.

Once the report system was developed, a second general aim was established. This aim focused on *providing a comparative analysis of two instructional programs which have a common instructional design – and aimed for the same final learning outcome – but followed two different instructional approaches at the content level*. The interventions are the same as those implemented in the third study (chapter five), in which their effectiveness was tested. However, a detailed description of both interventions is important in order to understand their success. Both instructional programs were designed with the aim of achieving the same final learning outcome, that is, improving sixth-grade students' writing competence through revision instruction. However, they followed two different approaches which have shown to be effective in improving elementary students' revision skills and writing competence (Graham & Harris, 2018; Rijlaarsdam et al., 2008). The first instructional approach was focused on the promotion of students' audience awareness, while in the other, students were instructed in the use of an explicit revision strategy. Then, according to these approaches, different intermediate learning objectives were established in each program. Given that both programs followed the same instructional design for the achievement of the different intermediate learning objectives, the analysis of the commonalities and differences on the content level would provide information about the theory of what contributes to revision skills in upper-primary students. Moreover, the analysis on the instructional design level would provide information about the effectiveness of different learning and instructional activities for the teaching of different types of content. Finally, the use of the report system proposed for the comparison of both interventions will allow researchers to ascertain the possible advantages and disadvantages of its use, as well as to propose possible adaptations in order to provide as much information as possible in the easiest and most economic (in terms of space) way.

To sum up, regarding the first aim, from a theoretical viewpoint this study can contribute to promoting the use of a standard for reporting writing interventions in detail

in scientific publications, which would have theory-building implications. Additionally, from an applied viewpoint, the use of the report system proposed would facilitate the transfer of scientific knowledge to the educational field and the implementation of evidence-writing practices in ordinary educational settings (Bouwer & De Smedt, 2018; Fidalgo et al., 2018; Rijlaarsdam et al., 2018).

Moreover, regarding the second aim, the specific use of this report system for the description and comparison of the two effective revision interventions will provide relevant information according to what upper-primary students need to improve their writing and revising skills and according to the specific instructional components that are effective in providing students with the proposed knowledge or skills. Additionally, the detailed analysis at the content and instructional design levels of both revision interventions can provide teachers with useful knowledge about effective instructional content and techniques to use in their real classroom settings.

Method of Study 4

Report System.

The report system that we proposed has four report elements. The first report element would be focused on the content, and would be defined as the "intended intermediate learning objectives". The other three report elements would be related to the instructional design and would be labelled as design principles and learning and instructional activities. These elements were adopted from the system proposed by Rijlaarsdam and colleagues (2018; p. 307-309). However, in comparison with this authors' system, we will specifically include the content report element (i.e., intermediate learning objectives) as the first element in the report system, given that it is the first choice to be made when designing an intervention. In Table 12, we will provide a brief description of the report elements, as well as an example of each of them.

Table 12

Description and examples of the elements included in the report system

Report Element	Description	Example
Intermediate Learning Objectives	- They should be formulated from a student's perspective - They refer to the specific knowledge, attitudes/motivations or skills included in the intervention - They support the achievement of the final learning outcome	*Acquire procedural knowledge about how to revise their texts through the use of the evaluative criteria to detect problems and correct them, linked to different aspects of the text*
Design Principles	- They establish the parameters required to achieve the set of specific intermediate learning objectives - They should be based on theoretical insights or empirical findings and they should be defined as means-end-relationships	*Provide students with the opportunity to observe a writer applying a revision strategy in a self-regulated way*
Learning Activities	- They represent the operationalisation of the previously established design principles - They are defined as any activities a researcher/instructional designer sets for an individual that contribute to the acquisition of knowledge, skills and competencies	*Students observed a model applying the strategy while thinking aloud to revise an imperfect text, acquired knowledge about how to regulate the strategy execution and the actions to revise a text*
Instructional Activities	- They are the tasks to engage learners in the proposed learning activities	*The instructor provided students with cognitive modelling while thinking aloud in front of the class, emphasising the steps of the PIENSO strategy to revise different quality texts, while regulating their own revision behaviour through self-questioning, self-instructions, self-directive statements associated with the specific steps of the strategy and the specific self-regulatory processes and motivational aspects*

Instructional programs.

In this section, we will briefly describe the interventions according to the content and instructional design levels. However, more information about the interventions, the instructional sequence and the procedure can be found in chapters five and six (p. 153 and p. 179, respectively).

Regarding the content dimension, both programs share some intermediate learning outcomes related to the acquisition of metacognitive knowledge about the revision process, the ability to set communicative goals and the internalization of the knowledge provided during the intervention. However, in the writer condition, revision was prompted through the addition of two specific intermediate learning objectives focused on the acquisition of procedural knowledge about how to revise through the use of evaluative criteria and the achievement of a self-regulated control in the use of a revision strategy. On the other hand, one additional specific intermediate learning objective was included in the reader condition to promote revision, focused on the acquisition of knowledge about how readers respond to imperfect texts.

Concerning the instructional design, it was the same for the achievement of the common intermediate learning objectives, but also was almost identical for the achievement of the condition-specific intermediate learning objectives. In this way the instructional design followed a similar pattern to strategy-focused instruction interventions in which students were mainly instructed through modelling and collaborative and individual practice.

Procedure.

First, and prior to the description of the interventions, the authors read in detail a chapter of Rijlaarsdam and colleagues' (2018) book, in which they carefully described all the elements included in the report system proposed for reporting writing interventions. Once we had read it, we discussed amongst ourselves the suitability of the original system and the possibility of including some small adaptations in order to make the reporting system more simple and clear. Thus, the main adaptation involved the addition of a specific report element called "intermediate learning objectives" (ILO). It was included as the first report element and was defined as the specific knowledge, attitudes/motivations or skills included in the intervention that are meant to support the

achievement of the final learning outcome, that is, the improvement of students' writing competence. This report element was implicitly considered in Rijlaarsdam and colleagues' (2018) original report system; however, in order to give it a more prominent position in the report system, we decided to add it as an independent and explicit element in the report.

Once the system was clear, both interventions were analysed in detail by the authors according to the two dimensions considered in the report system: what was taught and how it was taught. For the first dimension – what is taught – it was necessary to clarify the specific skills/knowledge we wanted students to acquire and the order in which each of the interventions is provided in all cases, as well as the theoretical and empirical rationales that support those choices. For the second dimension – how it was taught – we analysed in detail the specific design principles of the intervention, as well as the learning and instructional activities which were designed to achieve the proposed intermediate learning outcomes in alignment with the design principles.

Although it may seem like a simple task, the detailed analysis of the interventions in a comparative way was an arduous process. In fact, such a detailed analysis of the interventions, considering both the content and the instructional design, is key from a scientific point of view to evaluating the validity of a determined instructional program according to the theoretical or empirical framework in which it is embedded (as well as other factors, such as the aims of the study).

Having explained the aims and methods of each of the studies in this chapter, we now turn to the results section, which includes the four studies that composed this dissertation.

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3 THE ONLINE MANAGEMENT OF WRITING PROCESSES AND THEIR CONTRIBUTION TO TEXT QUALITY IN UPPER-PRIMARY STUDENTS

This chapter is based on:

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Abstract

Background: The online management of writing processes is an important factor related to the composition of high-quality texts. In the present study we analysed the time that upper-primary students devoted to writing processes, their distribution during composition and the contribution of both aspects to text quality. **Method**: 120 upper-primary students were asked to write an argumentative text in pairs under thinking aloud conditions. Verbalizations were analysed considering different writing processes and sub-processes. **Results**: Upper-primary students rarely used planning and revising processes. Planning, which basically involved content generation, was mostly activated at the beginning of the writing task. Revision, which mainly included reading, appeared at the end. The time devoted to writing processes or the moment in which they were activated had no effects on text quality. **Conclusions**: Not only did upper-primary students make little use of planning and revising processes, it was also ineffective. Thus, there is a need to provide them with high-quality instruction at schools from early on.

Keywords: Writing; Writing processes; Online management; Online measures

Introduction

Following the appearance of the first process model of writing in 1980 (Hayes & Flower, 1980), a considerable body of research has focused not just on the written product but the processes by which this is produced. The writing process component from Hayes and Flower's model (1980) has been generally used as a theoretical basis, as it was the first model that clearly identify the three cognitive processes involved in writing: planning, translating and revising. Planning involves idea generation, organization and goal setting. Translating involves sentence planning and transcription, and therefore requires knowledge of syntax and ability to handwrite (or keyboard) and to spell. Revision includes reading, evaluating and editing processes. The last two processes can function at a mechanical (e.g. spelling, handwriting and grammar) or substantive level (e.g. content and organization). The processes that writers engage in, and when these occur during composition may have potential impact on the quality of the resulting text. There is some existing evidence that how and when students engage in specific writing processes impacts the quality of their text (Breetvelt, Van den Bergh, & Rijlaarsdam, 1994; Levy & Ransdell, 1995; Van den Bergh & Rijlaarsdam, 2001).

Previous research has explored the amount of time that writers spend on different writing processes. Researchers have used a variety of online methods including concurrent self-reports (Fidalgo, Torrance, & Garcia, 2008; Torrance, Fidalgo, & Robledo, 2015; Kellogg, 1988; 2001; Torrance, Fidalgo, & Garcia, 2007) or thinking aloud (Beauvais, Olive, & Passerault, 2011; Breetvelt et al., 1994; Levy & Ransdell, 1995; Penningroth & Rosenberg, 1995). From those studies, a general pattern of the time that writers spend on different writing processes is discernible. For instance, Beauvais et al., (2011) studied undergraduate students writing both narratives and argumentative texts. They found that translating filled around half of the total composition time and that about 20% of time was devoted to each of planning and revision. Penningroth and Rosenberg (1995) reported a more fine-grained analysis of planning and revising subprocesses of undergraduate students writing narrative texts. Planning processes were dominated by idea generation with very little time devoted to goal setting or organizing. Although students tended to spend time revising, they rarely evaluated or revised. Similar results were found for secondary school students (Breetvelt et al.,1994; Van den Bergh & Rijlaarsdam, 1999; 2001). As far as we know, just two studies have explored the

processing time that upper-primary students devote to writing processes by means of self-reports in the context of instructional studies (Fidalgo et al., 2008; Torrance et al., 2007; Torrance et al., 2015). The results showed that, as with older students, translating was the main process, with significantly less time given to planning and revising. However, these data came from students' concurrent self-reports, which may lack reliability in upper-primary students. Self-reports also provide limited scope for more fine-grained analysis in terms of different writing subprocesses.

However, the ways in which students complete a writing task also vary in terms of how engagement in particular processes is distributed across the writing timecourse (Kellogg, 1988, 2001; Levy & Ransdell, 1995; Penningroth & Rosenberg, 1995; Piolat, Kellogg, & Farioli, 2001). In these studies time-on-task was divided into three equal periods. The results showed that whereas translating occurs throughout the writing process, toward the end of composition there are fewer episodes of planning and more of revision. Similar results were also found with secondary school students (Breetvelt et al., 1994; Van den Bergh & Rijlaarsdam, 1999; 2001). However, this pattern may change according to the demands of writing. For example, Penningroth and Rosenberg (1995) showed that adult writers revise from earlier when they face a particularly demanding writing task. As far as we know, no studies have explored how upper-primary students distribute writing processes during composition.

An important question therefore is how the time spent in different processes and their temporal distribution during composition contribute to text quality. Beauvais et al., (2011) found that the quality of undergraduate students' argumentative texts was positively related with a higher percentage of composition time devoted to planning. This effect was absent, however, when students wrote narratives. This finding is consistent with studies that found positive benefits of requiring adult writers to plan before writing full text (Kellogg, 1988; 1990). Levy and Ransdell (1995) showed that text quality depends on the time that undergraduate writers spend on revision in a writing task without genre constraints. However, other researchers studying secondary school students found no relationship between the total time spent in any of a number of different writing processes and sub-processes, and the quality of the resulting text (Breetvelt et al., 1994; Van den Bergh & Rijlaarsdam, 1999; 2001).

However, it might be the case that when a process occurs during composition affects the extent to which that process influences text quality. Most obviously, planning at the start of the writing process is, arguably, more likely to benefit text quality than planning towards the end. A series of studies by Van den Bergh and co-workers (Breetvelt et al., 1994; Van den Bergh & Rijlaarsdam, 1999; 2001) seem to confirm this. For example, Breetvelt et al., (1994) found that if 15-years-old students evaluate their plans at the beginning of the task, this tends to have a positive effect on text quality of their final composition. However, in later stages this relation became negative or absent. This could be explained by the fact that evaluation at the beginning would possibly involve the composition of different options trying to fit with the writing assignment. Moreover, they also found a negative relation between engagement in revision and text quality when revision occurred at the start or the middle of the writing task. No effects on text quality were found when revision occurred at the end of the composition. However, other studies have found that particularly the revision implemented at the end of the writing task has a positive impact on text quality in undergraduate students (Levy & Ransdell, 1995). There is some evidence, therefore, that the way in which writers distribute these cognitive activities during the writing process is related to the quality of the resulting text and varies between writers and contexts.

In summary, therefore, students, at least at university and secondary school levels, vary both in the extent to which they engage in particular planning, translating and revising sub-processes, and in how these processes are distributed across the writing timecourse. There is also evidence that for some processes both total time, and distribution across timecourse predict the quality of the final text. Few attempts have been made, however, to explore these effects in primary-aged children. Limpo and co-workers (Limpo & Alves, 2013; Limpo, Alves, & Fidalgo, 2014) studied written outlines produced by upper-primary children and found that the quality of their written planning in advance of text production did not predict the quality of their final text. Fidalgo and co-workers (Torrance et al., 2007) used concurrent self-reports to determine writing processes in students who had received specific instruction in how to plan and revise their text. The authors found significant but weak correlations between time spent planning and text quality. This pattern was reversed in the same students, followed up two years later (Fidalgo et al., 2008). Torrance and colleagues (Torrance et al., 2015) successfully

trained students to engage in pre-planning processes, but did not find evidence that this benefitted the quality of their texts.

Therefore, studies exploring process use across the writing task in upper-primary writers have, at best, relied on self-reports to determine what process is engaged in and when. Consequently, these studies have yielded very mixed findings about the effects of process on written product. The present study aims to move forward understanding in this area by answering the following three research questions: (1) How much time do upper-primary students devote to different writing processes when they write short argumentative texts?, (2) How are these processes distributed during composition? and importantly (3) Does the overall time in process and/or distribution of process across time-on-task predict the quality of the final text?

Collecting processes data in younger writers is, however, somewhat problematic. This was particularly the case of our study, in which we differentiated between a relatively large number of different sub-processes. Passing responsibility for determining processes onto the student in the form of concurrent self-report (e.g., Torrance et al., 2015) is probably sub-optimal in this context. However asking students to think aloud while writing – something that some adult writers find difficult – is likely to be reactive and there is likely to be considerable, non-random variation in students' ability to comply. A novel alternative, which we used in the present study, is to record what students say when they work in pairs and are asked to explicitly communicate their thoughts and actions to their partner. This allowed us to follow the coding scheme described by Penningroth and Rosenberg (1995), which is considerably more fine-grained than has been possible in previous studies with children in the age range.

Method

The data was collected in the context of an intervention study (at pre-test) and has been not reported in other manuscripts.

Participants

The sample comprised 120 Spanish students of 5th (N = 62) and 6th (N = 58) grades from six classes within the same school in León (a city in the north of Spain). Students were divided into 60 pairs (see Procedure). Students' age ranged from 10 to 12 years (MD

= 10.8; SD = .68), with a similar percentage of boys (51.4%) and girls (48.6%). Most came from families living on medium to high incomes.

Writing instruction in the Spanish educational context is focused on the features of different textual genres and on grammatical and spelling accuracy, without any kind of strategy-focused instruction in the use of planning and revision processes.

Instruments

Writing task.

Students completed an argumentative writing task in which they should defend if they were for or against reading books or the captivity of wild animals in the zoo. The topics provided were close to the students so that they did not need additional information to write the text. Also, topics were evenly distributed controlling class and grade. For the writing task students were provided with a draft sheet, whose use was optional, and a final text sheet. Students wrote their texts with a digital pen. The digital pen was a LiveScribe 2GB Echo smartpen which has a regular appearance but hosts an infrared camera at its tip and an integrated microphone. These devices allowed us to collect not only the thinking aloud but also the digital trace of what was written. Thus, the whole writing process of each pair was recorded. The pens have their own data storage so they were used in a whole-class context. Data were downloaded from the pens through the use of the Livescribe Desktop application. Thus, for each pair we got a PDF file with the audio and the writing process.

On-line Writing Processes Measures.

Once the verbal reports had been transcribed, reports were divided into segments, each segment containing just one of the writing processes considered in the coding system.

According to previous studies (Beauvais et al., 2011), and based on Hayes & Flower's (1980) writing model, three processes were considered in the coding system: planning, translating and revision. First, regarding the planning process, three sub-processes were included: (1) generation of ideas, when students generated content for their text ("*animals have to be free because they need space like humans*"); (2) organisation, when students were organising or talking about how to organise the content

("*first we have to say whether we are for or against*"); and (3) setting goals, the elaboration of objectives to be achieved in the text ("*I want to make a good text*").

Second, the translating process was related to the creation of the text. That is, when students were verbalizing aloud or dictating what they were writing.

Third, in the revision process, five sub-processes were considered: (1) reading, when one of the members of the pair read any part of the written text or the text in the planning sheet; evaluation, which refers only to the evaluation act without making changes to the text. It was also considered whether (2) the evaluation was mechanical ("*I think adventure is with b*") or (3) substantive ("*I don't know if this idea is well explained*"). In the last sub-process, edition, which refers only to the act of making changes to the text, it was also considered whether (4) the edition was on a mechanical or (5) substantive aspect. Finally, an additional category called "*Others*" was added, which included verbalizations that were not related to the writing task.

Through the use of macros in excel, the duration of each segment was calculated. This allowed us to calculate both the total time devoted to each process and sub-process, and the percentage of time depending on the total duration of the writing task.

To determine intercoder reliability, a contingency coefficient was calculated over 1597 categorizations coded by two independent coders out of a total of 7897. This represented the 20% of the total categorizations. Cohen's kappa equaled .94 showing a very good reliability of the coding schema.

Text quality measures.

Texts were evaluated holistically by means of reader-based measures. Reader-based measures involved assessing aspects related to the structure, coherence and quality of the texts, using an adapted version of the procedure used by Spencer and Fitzgerald (1993). The authors showed that these measures taped different aspects of the writing performance.

Structure was rated on a 4-point scale (1-lack of structure and 4-well structured). The score was based on the extent to which students created a global framework to present the topic and their opinion, used different connectors, mentioned the main goal of the text and the thesis or the use of the typical parts of a text like introduction, development and

conclusion. *Coherence* was assessed on a 4-point scale (1-incoherent and 4-very coherent). The score was based on whether it was possible to identify the main topic, there was a clear development without digressions, they provided a clearly defined general context, details were organized, they used cohesion marks and fluent speech and there was a conclusion. *Quality* was assessed on a 6-point scale (1- incomprehensible and 6-unsurpassable). It was based on the presence of a clear sequence of ideas, good global organization, suitable vocabulary, a variety of interesting details, correct sentence structure and correct punctuation and spelling.

Two raters scored all texts. Inter-rater reliability (r) was high (Structure, .82; Coherence, .85; Quality, .92).

Procedure

Students were evaluated collectively in a natural context within the regular Language classes with about 20-25 students per class. Students were given 50-55 minutes to complete the task, although no one needed more than 30 minutes.

The session began with the instructor explaining the assessment task. Students had to write an argumentative text in pairs while thinking aloud. Students were grouped in pairs to facilitate the verbalization of their actions and thoughts. Pairs were formed by the ordinary Spanish Language teacher. The teacher was asked to match students who had a similar level of competence in this subject. Each student within the pair received a different role. One of them was in charge of writing the text while thinking aloud, verbalizing everything they did and thought. The other one was in charge of monitor and help his partner to create the best possible text.

Before starting the task, students performed a brief thinking aloud training aimed to familiarize them with this procedure. First, students observed a modelling in which the instructor verbalized all her actions and thoughts while completing a crossword puzzle. Then students, in the already created writing-pairs, completed the crossword puzzle through the use of thinking aloud. During the training task and assessment the instructor encouraged students to verbalize absolutely everything they thought or did.

Data Analysis

Descriptive data is first presented. Then linear mixed effects models were carried out to determine the distribution of processes over time, and the relationship between processes and quality. These models are specified in the relevant sections in the text below.

Results

Time Spent in Different Processes

Table 1 presents the descriptive data concerning students' use of the writing processes. The table shows the average time spent by students for each writing process and the maximum and minimum time. We also report the percentage of time that students spent on the main writing processes (i.e. planning, translating, revising, others) considering each student's total composition time. For each main writing process (e.g. planning and revision) the percentage of time devoted to its specific sub-processes is also provided. Finally, the percentage of pairs that used each writing process is presented.

Table 1

Engagement of student-pairs in specific writing activities, summarized across time-on-task

	Total time spent in process (seconds)		**Percentage of time-on-task**	**Pairs who used this process**
	M (SD)	Min-Max	M (SD)	
Planning	223 (117)	46-556	19 (9)	100%
Generation	196 (111)	46-540	86 (10)	100%
Goal setting	5 (10)	0-55	3 (4)	47%
Organization	17 (16)	0-69	9 (8)	89%
Translating	604 (235)	210-1290	52 (11)	100%
Revision	59 (52)	0-271	5 (4)	93%
Reading	40 (44)	0-228	57 (36)	82%
Evaluating mechanics	6 (10)	0-55	14 (22)	55%
Evaluating substance	6 (11)	0-57	12 (23)	51%
Editing mechanics	3 (9)	0-63	5 (11)	33%
Editing substance	2 (5)	0-33	4 (11)	18%
Other	282 (160)	46-637	24 (9)	100%

As can be seen in Table 1, the dominant process was translating with less time devoted to planning and even less to revising. Regarding planning and revising subprocesses, it is worth highlighting that upper-primary students mainly used idea

generation and reading respectively. Very little time was devoted to processes such as organizing, setting goals and evaluating and editing both substance and mechanical aspects.

How are Writing Processes Distributed during Composition?

Following an approach adopted in several previous studies (e.g. Van den Bergh & Rijlaarsdam, 1999), we determined, for each sub-process, the probability that students were engaged in that process at each point in time during completion of the composition task. To do this we evaluated a series of nested logistic mixed-effects regression models. Our dependent variable was whether or not the student was engaged in the process during a particular second of the writing time-course (dummy coded as 1= engaged in process, 0 = not engaged in process). We started with an intercept-only (baseline) model with random by-student-pair intercepts, and by-student-pair slopes from time (Model 0). We then added a fixed effect for time (Model 1). Significantly improved fit of Model 1 would indicate variation in process use over time. Models were fitted with a binomial (logit) link function by maximum likelihood, using the Laplace Approximation and implemented in LME4 (Bates, Mächler, Bolker, & Walker, 2015). Model fits were compared by χ^2 difference test.

As might be expected, we found strong evidence of change in tendency to engage in a particular process over time for nearly all of the processes that we identified. This was true when probability of engagement in a specific process was estimated as a function of raw time (in minutes) (Figure 1) and when time was normalised across students by taking percent of task completed (Figure 2). For raw time, Model 1 provided a significantly better fit than Model 0 for all processes except for Editing Substance and Editing Mechanics – which, as can be seen in Table 1, occurred quite rarely across students pairs ($\chi^2(1) = 1.7$ and .26 for Editing mechanics and substance respectively; $\chi^2(1) > 4.8$, $p < .03$ for Evaluating Mechanics and for Reading; $\chi^2(1) > 8.4$, $p < .003$ for all other processes). For percent time, Model 1 provided significantly better fit than Model 0 for all processes except for Editing Substance ($\chi^2(1) > 9.4$, $p < .003$ for all other processes).

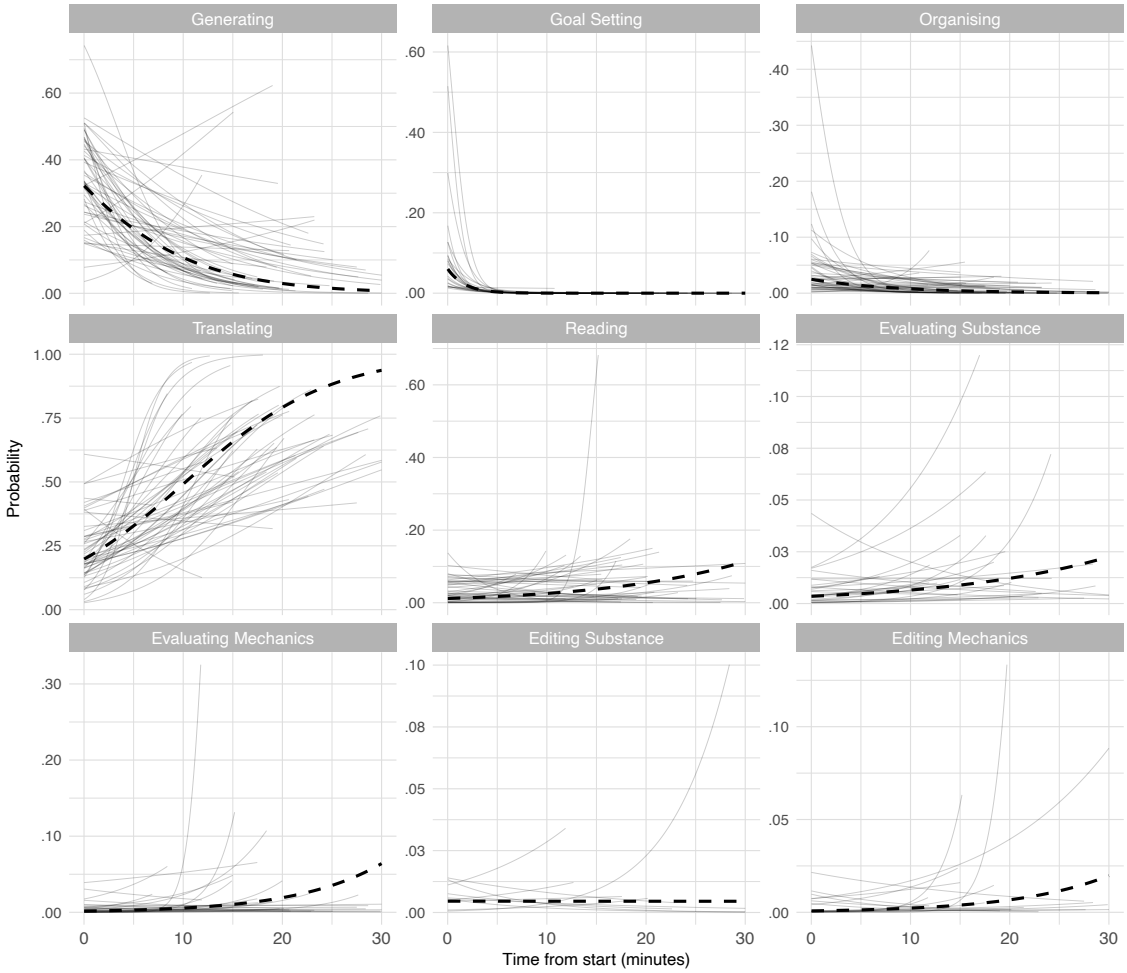

Figure 1. Probability of engagement in specific writing sub-processes as a function of time from start of task. Estimates for individual students, with the mean shown as a dashed line.

As Figures 1 and 2 show, planning content (generating) and, particularly, goal setting, tended to occur near the beginning of the writing task, with very few pairs continuing to plan later on. Translating occurred across the whole writing process. Students tended to spend very little time reading and revising what they had written. As might be expected, where this did occur, it tended to be towards the end of the time spent on the task.

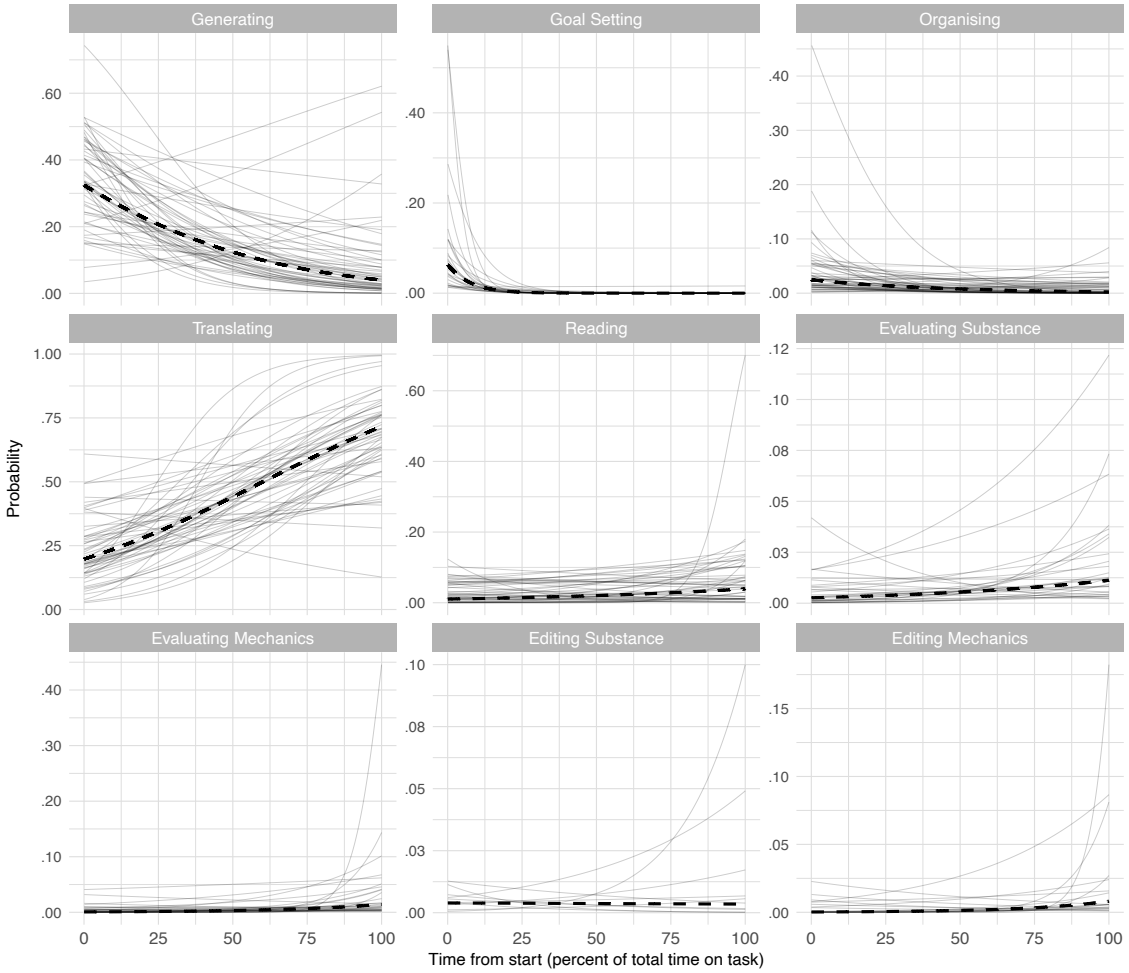

Figure 2. Probability of engagement in specific writing sub-processes as a function of percent of total time on task completed. Estimates for individual students, with the mean shown as a dashed line.

Are the Allocation of Time to Different Composing Activities or its Distribution during Composition related with Text Quality?

We determined relationship between text quality and an overall tendency to engage in a specific process with a similar model to the one described above, starting with an intercept-only model with random by-student-pair intercepts and then adding quality rating as a fixed effect. This model did not provide significantly improved fit. We, therefore, did not find evidence that the total time spent in a specific process, regardless of when this occurred during the writing task, affected the quality of the final text.

However, it is possible that the important factor is not the extent to which a particular process is engaged in, but when this occurs during the writing task. To

determine whether this had an effect we started with Model 1, described in the previous section, then added a fixed effect for quality rating (Model 2), and finally the interaction between time and quality rating (Model 3). Model 3 did not provide significantly improved fit relative to Model 2. We, therefore, did not find evidence that any effect of engaging in a specific process on the final product was moderated by time-on-task (i.e. no evidence that the quality of the final text was dependent on when the students engaged in each specific process).

Discussion

The first goal of the present research was to explore the time that upper-primary students spent on different writing processes. According to previous studies developed with older writers (Beauvais et al., 2011; Breetvelt et al., 1994; Levy & Randsdell, 1995; Penningroth & Rosenberg, 1995; Van den Bergh & Rijlaarsdam, 1999; 2001), translating was the dominant process, covering half of the total composition time. As might be expected, therefore, at least for the writing tasks typically used in these studies, time on task is dominated by writing full text (Alves, Castro, & Olive, 2008; Olive, Kellogg, & Piolat, 2001). Compared with previous studies with upper-primary students (Fidalgo et al., 2008; Torrance et al., 2007; Torrance et al. 2015), the present research provides a relatively fine-grained analysis of planning and revising subprocess. Regarding planning, the main subprocess was idea generation, with very little time devoted to organizing and setting goals. These last two processes, however, are thought to be particularly important when completing the argumentative writing task that was the focus of this study (Beauvais et al., 2011; Breetvelt et al., 1994). Similar, with regard to revision, although students typically spent at least some time reading their text, evaluation and editing were almost entirely absent (see also Torrance et al., 2007). Previous research has suggested that students at this age probably need external support if they are to revise their text (De La Paz, Swanson, & Graham, 1998). Arguably, therefore, students in the present study tended to adopt what is sometimes described as a knowledge-telling approach to writing (Bereiter & Scardamalia, 1987). They wrote down content as they thought of it rather than engage in strategic thinking about how best to present their ideas to their audience.

Our second question concerned the distribution of writing processes across the composition task. As we predicted, planning mostly occurred at the beginning of the writing process, while revision, on the rare occasions where it occurred, tended to be

engaged in towards the end of the task. Again, this was predictable, although in principle it would be possible to compose text in smaller plan-write-revise cycles. These results are in line with previous studies conducted with adult writers (Kellogg, 1988, 2001; Levy & Ransdell, 1995; Penningroth & Rosenberg, 1995; Piolat et al., 2001) and secondary school students (Breetvelt et al., 1994; Van den Bergh & Rijlaarsdam, 1999; 2001). They seem to indicate that, despite the recursive nature of writing (Hayes & Flower, 1980), writing processes are not equally likely to be activated at any time during composition. It might be that, at schools, teachers promote the use of these processes in a linear way (Gilbert & Graham, 2010). Nevertheless, more studies are needed in order to explore how students distribute writing processes during composition in other genres (Beauvais et al., 2011).

Perhaps our most important finding, however, is a failure to find any relationship between the writing process and the quality of upper-primary students' texts. Generally, the writing process has been related to the written product in older writers (Beauvais et al., 2011; Levy & Ransdell, 1995). However, this relationship is not straightforward in the literature with upper-primary students. From the best of our knowledge, just one study found a weak relation between upper-primary students' writing process and text quality after students have received specific instruction (Torrance et al., 2007). Several reasons might explain the findings of the present study.

First of all, it could be the case that the method used in this study disrupted the writing process of students to the extent that its effects on text quality disappeared. However, this explanation does not fit well with our findings, as students' texts were at least mainly coherent and similar in quality to what might be expected for writers at this age. In the present study, students wrote poorly structured texts ($M = 1.16$, $SD = .37$), with low coherence ($M = 1.38$, $SD = .49$), and, consequently, low overall text quality ($M = 2.11$, $SD = .69$), as it has been found in previous studies with the same measures and students of the same age writing alone (see Fidalgo et al., 2008; Torrance et al., 2007; Torrance et al., 2015). That is, writing-in-pairs while they articulated their thoughts did not prevent them from writing. Also, it could be argue that our collaborative task influenced students' use of writing processes or its distribution during composition. However, this seems unlikely because our findings matched with previous studies in which students wrote alone (Fidalgo et al., 2008; Torrance et al., 2007; Torrance et al., 2015).

From our point of view, there is a more plausible explanation. Planning and revising subprocesses have shown to make a difference in text quality in older students (Beauvais et al., 2011; Levy & Ransdell. 1995). However, these processes rarely occurred in our sample. Regarding planning, upper-primary students mainly generate ideas. Previous studies found that when generating occurred at the beginning of the writing task it has a negative effect on text quality (Breetvelt et al., 1994; Van den Bergh & Rijlaarsdam, 1999; 2001). In our study, however, there was no relation at all between text quality and idea generation. Additionally, upper-primary students did not engage in other sub-processes such as goal setting and organizing, in spite of their apparent importance (Breetvelt et al., 1994). That is, at least for argumentative writing, not only retrieving ideas is important. Writers also need to take the audience into account by stablishing communicative goals. Thus, to achieve the communicative goals students are required to plan and to organize ideas appropriately and deliberately (Beauvais et al., 2011). In fact, a meta-analysis of writing interventions showed that goal-setting was particularly effective to improve upper-primary students' writing skills (Koster, Tribushininaa, De Jong, & Van den Bergh, 2015).

With regard to revision, the evidence is even more clear. If they do not revise, as we found in the present study, revision cannot have an effect on text quality. Also, it should be considered that revision mainly involved reading without evaluation and editing. Several reasons might explain this fact. First, students at this age may lack the critical reading comprehension skills needed to construct an accurate representation of their text and detect problems (Hayes, 2004). Second, it could be that young writers tend to overestimate the quality of their texts when reading them (Beal, 1996) so they may not see problems in their texts.

In conclusion, the findings of the present study suggest that, without specific instruction, upper-primary students rarely engage in planning and revising processes and, even if they use them, they do not contribute to text-quality. In the present study, therefore, we did not find evidence of a relationship between upper-primary students' writing process and text quality.

Finally, as an educational implication, it is important to note that previous research have shown that children as young as 6 years (Arrimada, Torrance, & Fidalgo, 2018) can benefited from instruction targeting planning skills. Therefore, in order to move students

toward a more expert-like writing, it would be critical to provide teachers in regular schools with evidence-based practices to support young writers' use of planning and revising, not only in writing but also in reading-writing tasks (Fidalgo, Torrance, Arias-Gundín, & Martinez-Coco, 2014). Several studies have demonstrated the efficacy of strategy-focused writing instruction with typically developing upper-primary students (Fidalgo, Torrance, & Robledo, 2011; Fidalgo, Torrance, Rijlaarsdam, Van den Bergh, & Álvarez, 2015; García & Arias-Gundín, 2004; García & De Caso, 2002; Torrance et al., 2007) or students with learning disabilities (González Seijas, 2003). These studies demonstrate the value of providing explicit knowledge about what to plan. Therefore, it would be critical to implement this kind on intervention in schools from early on. Early intervention would improve students' writing competence and contribute to academic performance in later stages, where the use of strategies have also proved particularly effective (Iniesta, Lopez-Lopez, Corbil, Perez, & Costa, 2017; Roces & Sierra, 2017).

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4 EFFECTS OF DIRECT INSTRUCTION AND STRATEGY MODELLING ON UPPER-PRIMARY STUDENTS' WRITING DEVELOPMENT

This chapter is based on:

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Abstract

Strategy-focused instruction is one of the most effective approaches to improve writing skills. It aims to teach developing writers strategies that give them executive control over their writing processes. Programs under this kind of instruction tend to have multiple components that include direct instruction, modelling and scaffolded practice. This multi-component nature has two drawbacks: it makes implementation challenging due to the amount of time and training required to perform each stage, and it is difficult to determine the underlying mechanisms that contributes to its effectiveness. To unpack why strategy-focused instruction is effective, we explored the specific effects of two key components: direct teaching of writing strategies and modelling of strategy use. Six classes (133 students) of upper-primary education were randomly assigned to one of the two experimental conditions, in which students received instruction aimed at developing effective strategies for planning and drafting, or control group with no strategy instruction: Direct Instruction (N=46), Modelling (N=45) and Control (N=42). Writing performance was assessed before the intervention and immediately after the intervention with two tasks, one collaborative and the other one individual to explore whether differential effects resulted from students writing alone or in pairs. Writing performance was assessed through reader-based and text-based measures of text quality. Results at post-test showed similar improvement in both intervention conditions, relatively to controls, in all measures and in both the collaborative and the individual task. No statistically significant differences were observed between experimental conditions. These findings suggest that both components, direct teaching and modelling, are equally effective in improving writing skills in upper primary students, and these effects are present even after a short training.

Keywords: Writing, Strategy-focused instruction, Components analysis, Modelling, Direct instruction.

Introduction

Theories of the psychological processes underlying how people write extended text – the processes by which, for example, students write essays and researchers write papers – have historically had two main strands. Writing is characterised as a problem solving process, in which the writer makes deliberate and explicit decisions about content, structure, rhetoric, and word choice (Bereiter and Scardamalia, 1987; Flower and Hayes, 1980; Hayes, 1996). Writing is also cognitively demanding: The processes associated with text production must be coordinated within the constraints imposed by a limited capacity of working memory (Kellogg, 1988, 1999; McCutchen, 1996; Torrance and Galbraith, 2006). Therefore writers must coordinate several cognitively costly activities including retrieval of prior knowledge, planning and structuring content, formulating sentences, and monitoring output. At the same time, writers need to maintain in mind their communicative goals and the needs of their audience (Fayol, 1999; Flower and Hayes, 1980). Writing is particularly demanding task for young writers. Writers who have not yet fully developed low-level transcription skills – who are not yet able to plan fluently and accurately and execute sentences that are grammatically correct and words that are accurately spelled and neatly written – face a combined challenge. They struggle to produce accurate sentences, and the consequent additional effort draws resources away from the higher-level problem solving activities necessary to generate well-structured and content-rich text. Arguably therefore, as Graham and Harris (2000) observe, writing competence requires not only automatization of transcriptions skills but also self-regulation in order to handle high-level cognitive processes of writing such as planning and revision, which are directly related to the production of high-quality texts (Limpo et al., 2014; for a review see Berninger, 2012).

Strategy-focussed writing instruction aims to teach developing writers strategies that give them executive (self-regulatory) control over their own writing processes. Several meta-analyses (Graham and Perin, 2007; Graham et al., 2012; Graham and Harris, 2014) have indicated that strategy-focused instruction is the most effective approach to improve students writing, relative to the other types on instruction identified in their meta-analyses, with typically large positive effects on the quality of students' texts. This approach aims to give students explicit strategies for regulating both what they write and the processes that they adopt when writing it (Alexander et al., 1998; Harris et al., 2008).

Programs of strategy-focussed instruction tend to have multiple components, and these vary to some extent across different implementations (Pressley and Graham, 2006; Harris et al., 2011). However, instruction typically includes activities aimed at activating relevant prior knowledge, direct instruction aimed at giving declarative meta-knowledge about appropriate writing strategies, typically based around various mnemonics, modelling of writing strategies in which the instructor "thinks aloud" in front of learners demonstrating a strategy while composing, and scaffolded practice. Merrill (2002) refers to these five components at the "First Principles" of instruction. The aim is for a progressive decrease in scaffolding, with strategies moving from being something that the teacher tells the students to do, to internalised self-talk by which the student regulates their own writing behaviour (Pressley and Harris, 2006; Graham and Harris, 2014).

As we have noted, a number of evaluations of instructional programs based on these components have found that the programs as a whole are successful, and more successful than other approaches to writing instruction. However, these studies necessarily have evaluated a package of instructional components. It is unclear whether all or just some of those components contribute to the positive outcome. Therefore, several researchers have pointed to the need for component analyses (Graham and Harris, 1989; De La Paz, 2007; Brunstein and Glaser, 2011). Such studies are critical for both theoretical and educational reasons. From a theoretical perspective, understanding the relative contribution of the different components of strategy-focused instruction gives insight into the underlying mechanisms of writing development (Sawyer et al., 1992). Understanding the relative efficacy of different instructional components in a "package intervention" also contributes to understanding of students' learning processes (Hopwood, 2007). From an applied perspective, full strategy-focused interventions typically do not fit well within the normal school curriculum, and teachers are liable to selectively include some but not all components in their classroom practice (De La Paz, 2007). This is for several reasons. Implementing strategy-focused instruction can be challenging for teachers. Some components, and particularly modelling, will often be outside of the teacher's skills set and are typically, in the US at least, not well-supported in professional development (Harris et al., 2009). Also, the best-known approach to strategy-focused instruction (Self-Regulation Strategy Development; e.g., Graham et al., 2000; Harris et al., 2006) requires teaching individual or small groups of students following a criterion-based approach. The number of instructional sessions devoted to

master different components and learning-goals therefore varies across implementation and across students. Adopting this approach in a normal, full-range classroom is typically problematic.

The challenge, therefore, is to identify which of the various components that comprise the strategy-focused approach are necessary to result in substantial positive effects on writing quality when taught to full-range classes. A handful of studies have aimed to compare the efficacy of different components. Several of these have focused on the role of instruction targeted specifically at student motivation, on the role of feedback, and on the effects of peer support (see De La Paz, 2007 for a review). Fewer studies have attempted to explore the specific contribution of the main instructional components detailed above (but see Sawyer et al., 1992; Fidalgo et al., 2011, 2015; Torrance et al., 2015).

Our present focus is on the contribution of direct instruction and of modelling to successful learning. Sawyer et al. (1992) assigned fifth and sixth grade students with learning difficulties to four conditions (1) full strategy-focused instruction, (2) strategy-focused instruction without goal setting and self-monitoring, (3) direct teaching only, and (4) practice control. In the direct instruction condition, the authors removed modelling and collaborative practice, and also instruction on the use of self-talk. The results did not show significant differences between conditions concerning text quality at any measurement occasion at either post-test or delayed post-test. This suggests that direct instruction without modelling is sufficient to improve writing quality, at least in struggling writers. Nevertheless, these results need to be treated with caution, given that the efficacy of modelling seems to be heavily dependent on several factors. For example, in line with Braaksma et al. (2002) findings, weak students benefit more when they can observe weak models. As the specific sample on Sawyer et al. (1992) presented learning disabilities, it might be the case that students did not benefit from a model that provides them with the opportunity to learn by observation.

The opposite result has also been found. Fidalgo et al. (2011), explored whether strategy-focused instruction remained effective when direct teaching was removed from the program. They compared two seven-session programs, both implemented in full-range classes. In one condition students received full strategy-focused instruction, comprising direct teaching (one session), modelling (two sessions), collaborative (two

sessions), and independent practice (two sessions). In the other experimental condition, the direct teaching component was omitted. The results showed that both experimental conditions outperformed the control group in text quality, with no significant differences between conditions. In another study, Fidalgo et al. (2015) analyzed the cumulative contribution of modelling, direct instruction, and collaborative and individual practice. Three sixth-grader classes participated in a lagged-group and cross-panel evaluation. Groups showed significant and substantial gains in text quality after an initial component, taught over two sessions, in which the teacher modelled effective use of specific writing strategies, and students then reflected on what they had observed. These sessions did not include any direct instruction or explicit strategy labelling. Subsequent components gave no significant additional benefit. This finding was observed for both compare-contrast essays and opinion essays. These results suggest that observation of a mastery model followed by a whole-class reflection is sufficient to improve sixth grade students' writing skills. Nevertheless, this finding should be interpreted cautiously. For example, it might be that *the first blow is half the battle*: the study does not rule out the possibility that starting with Direct Instruction would have resulted in the same effect, and indeed this is what might be predicted based on the finding detailed above. Therefore, a direct comparison of the benefits of these two forms of instruction is needed.

Our goal in the present study, therefore, was to directly compare the contribution of Direct Instruction and Modelling to writing development, through interventions aimed at improving text quality by teaching planning and drafting strategies. For that purpose, we designed two experimental interventions. In the Direct Instruction condition students received explicit declarative knowledge of planning and drafting strategies, supported by mnemonics. In the Modelling condition students were provided with procedural knowledge of how to implement planning and drafting strategies by observing a model. These two experimental conditions were contrasted with a control condition, in which students were taught about the linguistic and discourse features of good text, but were not taught writing process strategies.

Effects of each condition were tested with two tasks, one collaborative and one individual. Several studies have shown positive effects of collaboration on task performance, finding higher quality texts from collaborative writing than from individual writing (Yarrow and Topping, 2001; Wigglesworth and Storch, 2009). As Ohta (2001) pointed out, no two learners have the same strengths and weaknesses, so when working

together they can provide scaffolded assistance to each other and achieve a higher level of performance than they may have achieved on their own. Therefore, in the present study we wanted to explore whether differential effects resulted from students working alone or observing and commenting on each other's task, with the aim of encouraging each other to adopt the strategies that they had been taught.

Method

Design

Six existing classes of 5th and 6th students were randomly assigned to one of two experimental conditions and a control condition, with one 5th and one 6th grade class in each condition. Instruction in all conditions was aimed at training students to produce good quality argumentative texts.

Both experimental conditions received strategy instruction focused on the acquisition of planning and drafting writing strategies. In the *Direct Instruction* condition, the students received direct instruction aimed at delivering declarative knowledge about planning and drafting strategies, supported by the use of mnemonics and graphic organizers. In the *Modelling* condition, students observed an expert model, with the aim of delivering procedural knowledge about the same strategies, but without labelling these strategies or making them explicit. Students in the control condition were taught about the features of good argumentative text, but without any mention to specific strategies for regulating the processes by which these texts might be produced.

Writing performance was assessed before the intervention (pre-test) and immediately after the intervention (post-test). At each measurement occasion students completed two tasks: an individual task and a collaborative writing task performed in pairs that reflected the collaborative learning tasks students practiced during the intervention. All assessment tasks involved writing argumentative texts.

Participants

The sample comprised 133 Spanish upper-primary students in three 5th grade classes (N = 72) and three 6th (N = 61) classes. These were all drawn from the same colegio concertado (mixed state- and privately-funded) school. Students' ages ranged

from 10 to 12 years (Direct instruction: *M* = 10.48; *SD* = .50; Modelling: *M* = 10.75; *SD* = .61; Control: *M* = 10.62; *SD* = .57), with 50% of female students in direct instruction condition, 46% in the modelling condition and 49% in the control group. Most students came from families with medium to high incomes. An additional 13 students who had existing diagnoses of special educational needs received the same instruction as their peers, but we did not include their data in the analysis.

Prior to intervention, all students received similar writing instruction following a pattern typical in Spanish primary schools. This focusses on the features of different textual genres, and on grammatical and spelling accuracy, and did not include any explicit strategy instruction.

Students were allocated to pairs for the collaborative writing task by the teacher, with children of broadly similar ability within each pair. Students were assigned to roles – either Writer or Helper – which they maintained throughout the intervention. The teacher also decided which student in a pair was more extrovert, that is which student was more likely to think aloud during the composing task. That student then was selected as the writer, while the other student in the pair was the helper.

Instructional Programs

The intervention was delivered by one instructor to whole classes, with the same instructor in all cases. All sessions lasted for approximately 55 minutes in all conditions and followed the same pattern, consisting of two parts. The first 35 to 40 minutes of the session involved delivery of the specific instructional content of that session, varying according to condition. In the second part students practiced what they had been taught or had observed, completing a short writing task in pairs. Students with the writer role performed the writing task, verbalizing all their actions and thoughts throughout. Helpers sat next to the writer and monitored their writing processes and output. On the basis of the instruction that they had received in the first part of the session helpers commented on the Writers text, thoughts and, perhaps, processes, identifying issues and suggesting ways in which these might be resolved. The similarities and differences of the three conditions are summarized in Table 1.

Table 1

Summary of differences among conditions

	Direct Instruction	Modelling	Control
Instructional Approach			
Activation of prior knowledge	+	+	+
Motivation supporting	+	+	+
Practice by pairs	+	+	+
Direct teaching of cognitive writing strategies through mnemonics	+		
Modelling of the use of cognitive writing strategies through thinking aloud		+	
Analysis of high-quality argumentative texts			+
Instructional Content			
High quality argumentative texts	+	+	+
Planning and drafting writing strategies	+	+	
Kind of knowledge provided			
Self-regulated approach	+	+	
Declarative knowledge	+		+
Procedural knowledge		+	

Direct Instruction.

Teaching of planning (first session) and drafting (second session) was supported by graphic organizers and mnemonics specifically designed for this study. Students were taught the mnemonic "TARE" to scaffold planning their argumentative texts. *Tesis* (*Thesis*) prompted students to identify their stance on the topic (for or against); *Audiencia* (*Audience*) prompted students to think through the specific informational needs of their reader, and the rhetorical strategies that were likely to be most effective in persuading their readers of their position. *Razones* (*Reasons*) prompted students to identify several claims to justify their position. *Ejemplos* (*Examples*) reminded students of the need to evidence these claims.

In the second session students were taught a strategy for drafting their text based around "IDC", which encouraged planning of specific components of the text: An *Introducción* (*Introduction*) which should interest the reader and clearly state the student's thesis; *Desarrollo* (*Development*), representing the middle paragraphs in their text in which students were instructed to give reasons and evidence examples in

coherence and well-structured manner; and a *Conclusión* (*Conclusion*). Both strategies were supported by graphic organisers that showed the TARE and IDC structure, with explanations and examples.

During collaborative practice, the student with the *Helper* role was asked to support their partner's (the *Writer's*) use of the strategy taught in that session, commenting on the Writer's think aloud with specific reference to the associated mnemonic.

Modelling.

The instructor started these sessions by explaining that they were about to observe a very good writer planning (first session) or drafting (second session) an argumentative text. Students were asked to give close attention to the model because afterwards they would be asked to emulate what they had observed. Modelling involved semi-scripted "think aloud" demonstrating a self-regulating approach to writing argumentative text. The model externalised the internal self-talk that is associated with self-regulated strategy use, while implementing the same self-regulated writing procedure that was the intended learning outcome of the Direct Instruction intervention. The instructor therefore articulated her stance on the topic, setting reader-focussed goals, generating supporting ideas and so forth as she produced her written plan (Session 1) and draft of her text (Session 2). Importantly her think-aloud did not make direct reference to strategies and, particularly, did not mention the mnemonics taught in the direct instruction condition. In addition, the instructor included self-talk demonstrating self-belief ("*I can do it correctly"; "I am sure that I will get a high mark*") and self-encouragement to remain motivated and attentive ("*It is boring, but it is worth the effort*"). After modelling was complete students were given a copy of the written output of the modelled writing session – a written plan in Session 1 and a draft essay in Session 2. Finally, students practiced in pairs, with the Writer aiming to emulate what they had observed and the Helper prompting them (e.g., "*You are writing down evidence, but I think the teacher stated her own position first*").

Control.

In both sessions students received examples of high quality argumentative texts about the same topic, with the text in Session 1 arguing one position, and the text is

Session 2 arguing the opposite position. The text was read to the class and then students read it individually and answered questions about specific features of structure and content (e.g., "*What kind of text you just read?*", "*What is the main topic of the text?*", "*What evidence do they use?*", "*Give at least one argument not mentioned in the text.*"). The instructor then led a whole-class discussion about the text, bringing out ideas about the features that made it a successful argument. As in the other two conditions collaborative practice involved creating a written outline (Session 1) and drafting full text (Session 2). In Session 1 Helpers were encouraged to help their partners to generate ideas. In Session 2 they reminded their partners about specific features of high quality argumentative texts, and were also free to contribute additional ideas during the writing task.

Implementation and fidelity.

Intervention sessions were one week apart and occurred towards the start of the Spring school term. Sessions took place in literacy lessons and they were delivered in all cases by the first author who has previous training and experience in delivering similar interventions. To ensure full implementation of the instructional programs the program for each session were prescribed in detail. All texts written during the intervention were collected in individual portfolios which enabled us to verify that all students completed all tasks. In addition, all sessions were audio-recorded.

The following procedure ensured that ethical standards were maintained. Parents were informed of research aims via letters in which they gave written informed consent. They were given the opportunity to express concerns and to request that their children's data not be included in the study. The intervention took place in a common classroom context through several sessions spread in the normal school timetable. Teaching in all conditions covered, and went beyond, the requirements of the school curriculum. After finishing the study, the school was informed about the results of the different instructional conditions, and a specific strategy-focused instruction program and supportive materials, combining elements of the experimental conditions was provided to the students' normal literacy teacher to be implemented with the control group students.

Instruments and Measures

Writing assessment tasks.

To avoid a contamination of topic and measurement effects, writing performance was assessed by students writing argumentative essays with topics counterbalanced across assessment tasks and pre-test and post-test. Topics related to animal captivity and the value of reading (for the collaborative writing tasks) and whether or not sport is a good thing and the value of learning languages (for the individual writing tasks). These were presented on small cards which included specific topic with two pictures and the question "for or against?". For both the collaborative and the individual task, students were provided with two work sheets, one for planning or rough drafting, and one for their final text. Students were told that use of the first work sheet was optional. Students were asked to produce the best essay that they could write. For the collaborative task, the instructor also reminded student's roles as well as stressed the need to work together on the text. In both assessment tasks, students had one hour to write their texts, despite this, none wrote more than 35-40 minutes.

Texts from both the individual and collaborative assessment tasks were rated holistically through *reader-based measures* and analysed in detail to generate *text-based measures*.

Reader-based measures involved assessing the structure, coherence and overall quality of the texts, using methods adapted from Spencer and Fitzgerald (1993). *Structure* was rated on a 4-point scale, with 1 = lack of any obvious structure and 4 = well structured. Raters made decisions based on the extent to which the text had a global framework that made clear the argumentative function of each section of text. *Coherence* was also assessed on a 4-point scale, with 1 = incoherent and 4 = entirely coherent. This score was based on whether it was possible to identify the main argument, whether the text presented clear progression of ideas without digressions, whether the student defined a general context, and whether the text maintained local cohesion (sentences followed from each other). *Overall Quality* was assessed on a 6-point scale, with 1 = not suitable, hard to understand and 4 = excellent. Scores were based on the extent to which the text included rich ideas, diverse and appropriate, vocabulary, interesting detail, and correct sentence structure, punctuation, and spelling.

Two raters with previous experience of using these measures rated all of the texts independent in three separate rounds, one round per dimension. The inter-rater reliability (Pearson's *r*) average across assessment moments was high (Individual task: structure, .83; coherence .92; overall quality, .90; Collaborative task: structure, .80; coherence, .87; overall quality, .94).

Text-based measures focussed on the presence of relatively sophisticated coherence devices within the text. Four types of complex devices were identified: Structural ties (e.g., first*, secondly, finally*…), reformulation (e.g., *in conclusion…, in other words…, that is to say*…), argumentative ties (e.g., *for example…*, *therefore…, however*…), and meta-structural ties (e.g., *now, I am going to talk about…, In this text, I am going to convince you…).* Raters counted each instance of a device in each of these categories. The inter-rater reliability was again high (≥ .90 across all measures, and for both tasks). This measure is reported as a number of occurrences per 100 words to give an index of tie density, independent of text length. In addition, we also report text length, counting the number of words written in the final text and removing incomplete or crossed words.

Results

Observed means for reader- and text-based measures across test (pre-test, post-test) and condition (Direct Instruction, Modelling, and control) are shown in Table 2 (individual writing task) and Table 3 (collaborative writing task).

Table 2

Effects of intervention on performance in the individual writing assessment task. Mean scores with standard deviation in parentheses

	Direct Instruction		**Modelling**		**Control**	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Word count	81.5 (32.4)	80.8 (25.6)	92.4 (32.7)	91.4 (26.5)	72.0 (35.8)	65.8 (23.1)
Structure	1.05 (.23)	2.89 (1.18)	1.06 (.34)	2.55 (1.13)	1.03 (.17)	1.86 (1.15)
Coherence	1.11 (.31)	2.63 (1.15)	1.18 (.39)	2.41 (1.10)	1.08 (.28)	1.69 (.95)
Overall quality	1.45 (.69)	3.45 (1.37)	1.38 (.65)	3.38 (1.30)	1.22 (.28)	2.08 (1.18)
Sophisticated coherence devices	.64 (.96)	3.71 (2.67)	.42 (.59)	2.41 (2.44)	.57 (.82)	1.83 (2.53)

Table 3

Effects of intervention on performance in the collaborative writing assessment task. Mean scores with standard deviation in parentheses

	Direct Instruction		**Modelling**		**Control**	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Word count	71.8 (20.6)	64.8 (22.1)	75.5 (26.2)	83.3 (19.8)	55.3 (21.1)	68.1 (16.2)
Structure	1.24 (.44)	2.28 (.96)	1.16 (.38)	3.47 (.84)	1.06 (.24)	2.17 (.92)
Coherence	1.33 (.48)	3.33 (.86)	1.53 (.51)	3.47 (.84)	1.22 (.43)	2.33 (.84)
Overall quality	2.14 (.66)	4.76 (1.09)	2.26 (.73)	5 (1.16)	1.94 (.64)	3.06 (.94)
Sophisticated coherence devices	.52 (.92)	6.27 (3.58)	.23 (.45)	3.04 (2.80)	.58 (.78)	2.37 (2.10)

To evaluate intervention effects we tested linear mixed effect models with random by-student and by-class intercepts, and with condition (Direct Instruction, Modelling, Control), time (pre-test, post-test), and their interaction as fixed factors. This approach achieves the same end as performing a mixed-effects ANOVA, but allows for the possibility that variance is not homogenous across measurement occasions, a state of affairs that is likely in the present and similar contexts (Quené and Van den Bergh, 2004, 2008). Evidence of an effect of intervention comes from the interaction between condition and time-of-task. Each model therefore evaluated three planned contrasts: The two-way interaction between task (pre-test vs. post-test) and condition (each of Direct vs. control, Modelling vs. control, and Direct vs. Modelling). Statistical significance of these effects was evaluated against a *t* distribution with degrees of freedom corrected for the dependencies in the observations. We also report Cohen's *d* as an indication of effect size, calculated within-condition difference between pre-test and post-test.

Relationships among Measures

Correlations among dependent variables can be found in Table 4. As might be expected, quality measures were correlated, but these correlations are sufficiently low to suggest good discriminant validity.

Table 4

Correlations among reader-based and text-based measures at pre-test

	Individual task			Collaborative task		
	Coherence	Quality	Complex Coherence Devices	Coherence	Quality	Complex Coherence Devices
Structure	.46	.64	.23	.57	.49	-.008
Coherence		.51	.32		.67	-.07
Quality			.36			.19

Equivalence of Writing Skills at Pre-test

We first determined whether there was evidence of differences among three experimental groups at pre-test. One-way ANOVA indicated no statistically significant differences between groups for any of structure, coherence, quality and the use of sophisticated coherence devices, either for the individual or collaborative tasks ($F \leq 1.9$, $p \geq .20$ for all analyses). There was some evidence of pre-test differences in the length of students' texts (Individual: F (2.12) = 3.6, p = .03; Collaboratively: F (2.55) = 4.1, p = .02).

Intervention Effects – Pre-test vs. Post-test

Individual writing.

Looking first at the effects of intervention on performance in the individual writing tasks, we found no effect of intervention on the length of the texts produced by students. There were, however, clear effects on reader-based quality measures, with evidence of a greater improvement in performance relative to control group in both the Direct Instruction and Modelling conditions (Direct Instruction: Structure, t(120) = 4.0, p < .001, d = 2.6; Coherence, t(120) = 3.9, p < .001, d = 2.1; Overall Quality, t(120) = 4.1, p < .001, d = 1.9. Modelling: Structure, t(120) = 2.8, p = .007, d = 2.0; Coherence, t(120) = 2.9, p = .005, d = 1.6; Overall Quality, t(120) = 4.1, p < .001, d = 2.0). Comparing the effects of Direct Instruction and Modelling gave no statistically significant differences.

Students in the Direct Instruction condition showed an increase in the use of sophisticated coherence devices compared with the control group (Direct Instruction,

$t(120) = 3.2$, $p = .002$, $d = 1.69$). Note that although the effect size appears large here, there was also a substantial increase in the use of these devices in the Control condition. We did not find a statistically significant effect for the Modelling, relative to control, and again there was no evidence of a statistically significant difference between the effects of the Modelling and Direct Instruction.

Collaborative writing.

Effects of intervention on performance in the writing-in-pairs task showed statistically significant improvement on all variables apart from text length (Direct Instruction: Structure, $t(58) = 3.3$, $p = .002$, d = 1.5; Coherence, $t(58) = 2.9$, $p = .005$, $d = 3.0$; Overall Quality, $t(58) = 4.6$, $p < .001$, $d = 3.0$; Coherence markers, $t(58) = 4.5$, $p < .001$, $d = 2.6$. Modelling: Structure, $t(58) = 4.2$, $p < .001$, $d = 3.8$; Coherence, $t(58) = 2.7$, $p = .010$, $d = .68$; Overall Quality, $t(120) = 4.8$, $p < .001$, $d = 2.1$; Coherence markers, $t(58) = 2.0$, $p = .05$, $d = 1.7$). Comparing the effects of Direct Instruction and Modelling gave no statistically significant differences for structure, coherence and quality. Regarding the use of complex coherence devices, a significant difference was found favouring direct instruction condition compared with modelling ($t(58) = 2.9$, $p = .005$).

Role effects.

It is possible that students' role when practicing in pairs during instruction – whether they were Helper or Writer – affected the extent to which they benefitted from intervention. We tested this hypothesis by adding role, and its interaction with other factors, to our model. This did not significantly improve model fit. We therefore did not find evidence that role moderated the intervention effects.

Differential effects.

It is also possible that students' writing ability, as measured by scores on the pre-test task, could moderate effects of the intervention. For example, it could be that although there was no evidence that within the population as a whole Direct Instruction benefits students more that Modelling, weaker students benefit more from Direct Instruction and stronger students more from Modelling (or perhaps the reverse). With this aim we conducted moderator regression analyses using Hayes' implementation of the Johnson-Neyman technique (Johnson-Neyman, 1936; Hayes, 2013). This analysis examined the

effect of pre-test score, as a continuous predictor, on the effect of condition on post-test score. We found no evidence that effects of pre-test score on performance differed reliably across condition.

Discussion

The main purpose of this study was to compare the benefits of teaching upper-primary children planning and drafting strategies by either expert modelling or direct instruction. The pattern of results obtained in both collaborative and individual writing tasks confirm that both components of strategy-focused writing instruction are effective. Both experimental conditions showed greater gains in the quality of their texts on reader- and text-based measures, relatively to a control group that received non strategy-focused but text analytic instruction. In the present study we found benefits of strategy instruction after only two intervention sessions. This is in line with Fidalgo et al. (2015) who also found large, immediate benefits of students observing and reflecting on an expert model after two sessions in three different groups.

Improvement in text quality was not simply due to students writing longer compositions. The number of words written in all conditions in the present study did not significantly differ before and after intervention. Some previous studies have found that strategy focused interventions result in an increase in the number of words written by the students (for reviews, see Graham and Harris, 2003; Graham, 2006; Harris et al., 2009; but see Harris et al., 2012; Torrance et al., 2015). The fact that text quality improvements were not dependent on students writing more words suggests that intervention effects are not readily explained simply in terms of an increase in students' motivation.

The main aim of this study was, however, to determine the relative effects of direct instruction and modelling – two instructional components that are typically combined in strategy-focussed instruction. Our findings did not indicate any statistically reliable differences between the effects of these two components: modelling and direct instruction proved similarly effective in improving the quality of students' texts. The instructional content covered by these two conditions were the same. In both conditions, students were exposed to planning and drafting writing strategies associated with identifying audience needs, setting goals, generating and organizing content, and so forth. However, while in direct instruction the strategies were made explicit through mnemonics, in the modelling

condition students inferred writing strategies from the observation of a model. Therefore, students in the modelling condition used these strategies but did not label them at any time. This is, to our knowledge, the first study to directly compare these forms of instruction. Previous studies have found that direct instruction, in the absence of modelling, can be effective in developing writing skills (Sawyer et al., 1992) albeit in struggling writers rather than the full-range classes that were the focus of the present study. Fidalgo et al. (2015) found that modelling without direct instruction can be effective in developing writing skills in six graders' typically developing students. Our finding confirms that, for typically developing writers, both approaches, when applied in isolation, are effective. Note, however, that it is possible that if modelling had not been separated from other critical activities such as evaluation or elaboration (Braaksma et al., 2001), students in this condition could have outperformed students in direct instruction condition. This is what Sonnenschein and Whitehurst (1984) showed in their study, in which preschool students in observation plus evaluation condition performed better than their peers in the only observation condition. These results are consistent with findings reported by Fidalgo et al. (2011, 2015), in which modelling including self-reflection showed to be sufficient to improve writing skills in normally achieving upper primary students. However, we explicitly decided to focus only on modelling, removing the reflection component, to avoid the possible interference of the whole-class reflection and to guarantee that we test what students learned from their own observations and not from the others' reflections. Crucially, however, our results showed that, at least in the present context, even without direct instruction or any formal reflection by the students, they still learned as well from modelling as they did from direct instruction.

The collaborative and individual writing tasks showed similar patterns of results regarding text quality. Students in both experimental conditions improved their texts when writing collaboratively as well as when they wrote individually, which was not previously practised. The only difference found between the two tasks was related to the use of sophisticated coherence devices. In the individual task students in the direct instruction condition showed a larger increase compared to their peers in the control group. On the other hand, in the collaborative task both experimental conditions showed improvements on more sophisticated coherence devices compared to the control group and these were also significantly greater in the direct instruction compared to the modelling group. However, this specific text-based indicator did not have any impact on

global text quality measures, which did not reflect any significant difference between collaborative or individual tasks. Research comparing collaborative and individual writing has found evidence of a positive effect of collaboration on task performance, which supports the use of collaborative writing tasks (Sutherland and Topping, 1999; Yarrow and Topping, 2001; Storch and Wigglesworth, 2007; Wigglesworth and Storch, 2009). These studies found that the quality of children's collaborative writing was significantly higher than that of their individual writing. However, in the present study we did not find any difference between collaborative and individual task. It may be the case that the quality of the feedback given to the writers by the helpers was poor due to the complexity of the strategies taught, the duration of the intervention, the fact that only one component was taught in each condition and the short period of time devoted to practize collaborative writing. For example, for helpers in the modelling condition giving high-quality feedback might be especially complicated, given that they should remember the model process to guide their partner (*"I remember that the model first thought in the audience and then tried to find reasons to convince them")* instead of recalling a mnemonic representing planning or drafting steps, as it was the case of helpers in direct instruction condition (*"Before R-reasons, we need to think in A-audience"*). Also, although the pair work was clearly established, previous research on pairs work has documented differences among the way in which learners participated in writing together (e.g., Schultz, 1997; Storch, 2001), which might have an effect on the quality of the final outcome. Therefore, future research is needed to explore the quality of the feedback provided and the kind of relations established between students. A detailed analysis of the pair transcripts recorded during the writing activity may provide interesting information about these issues.

Additionally, the analyses of the students' role during emulative practice in the experimental conditions did not show significant results. Thus, students playing "writer" or "helper" roles in collaborative practice seemed to benefit equally in both intervention conditions. This suggests that engagement with the instructional content – whether delivered directly or by modelling – is similar either if the student responds by producing a text or by coaching another student.

The failure to find a difference in the efficacy of the Modelling and Direct Instruction approaches appeared to be true across the range of student ability. It was not the case that for weak students, or for strong students, one intervention proved more

effective than the other. This result is not in line with previous studies, in which stronger students, not sampled by Sawyer and co-workers, may particularly benefit from modelling (Groenendijk et al., 2013). One possible explanation for the lack of differences in the present study might be because we did not include the data of struggling writers in the analysis or, actually, there were not many abilities differences between students. Additionally, this was not helped by the floor effects and low variability in students' initial writing achievement found at pre-test in our study. In subsequent studies, measures with larger range scales should be considered.

We want to quality our overall conclusion – that teaching writing strategies by modelling and by direct instruction are equally effective – in two ways.

First is possible that the positive effects of both interventions might have resulted just from an increase in student motivation. This is plausible but, as we noted above, we did not find reliable increases in the quantity of text produced by students at post-test, which would be the most likely effect of an increase in motivation. It did appear that the students produced better quality text because they had developed an understanding of text features and text production strategies that improved the quality of their written expression.

The failure to find a difference between the Modelling and Direct Instruction conditions might, however, also have a motivational explanation. It is possible, for example, that direct instruction was better at helping students to understand and remember the writing strategies but modelling was better at motivating them. Again this is plausible but, we believe, unlikely. Motivational features were quite well-controlled in across both conditions: both were delivered by the same instructor and we do not have any reason to believe that the content or delivery of either of the two interventions was intrinsically more motivating. Both conditions were novel and both included activities that, anecdotally, students enjoyed. In fact, both conditions included teaching aimed to promote students´ motivation, although there is no way of knowing whether or not these motivational components were equally effective. Again, if the two conditions were different in their motivational effects then we would expect to find differences across conditions in the amount that students wrote, and this was not that case.

Second our research does not rule out the possibility that the effects of modelling and direct instruction condition are temporary, or that one of the interventions had more persistent effects than the other.

Finally, in the present study we randomly allocated intact classes, rather than students, to conditions. Random allocation of children to condition is sometimes see as a gold standard. However we do not believe that this is the case for research of the kind that we report here. If you put a random collection of students together and then teach them as a group, and particularly if you then make them work collaboratively as we did in the present study, you risk both substantially disrupting students' ability to learn and generating findings that do not generalise to the whole-class situation in which teachers will need to apply the intervention. Students placed in a new group will devote attention to making friends, getting comfortable with their new classmates and possibly classroom, and so forth rather than to intervention content. That is, some of the whole-class effects that we get if you do not randomly allocate are effects that you actually what to be there. If you randomly allocate student to condition and then teach whole classes, you will still get class-level effects, but these are effects – differential performance across classes as a result of unpredictable new group dynamics – are likely to reduce the benefit they get from the intervention and the generalisability of our findings.

In summary, our findings suggest that, for typically developing upper primary students, both modelling and direct instruction are effective to improve writing skills and result in significantly better-quality argumentative texts even after a short instructional period.

Ethics statement

The present study involved students, in all conditions, engaging in normal classroom activities and collection on normal performance data (i.e., nothing that would not happen normally during school day). Unlike systems in, for example, the US, Spanish national guidelines and guidelines at University of León where the research was based, do not require that research of this kind go before an ethics panel. They require that the researcher commits to conduct research under the Code of Ethics of the World Medical Association (Declaration of Helsinki) (Williams, 2008). Plans for the present research were scrutinized and accepted both by the Spanish national research committee of

Educational Sciences Area and the University of León Vice-Rector for research. They were discussed in detail with, and approved by, the schools in which the research was conducted. Additionally, parents were informed of research aims via letters in which they gave informed consent. They were given the opportunity to express concerns and to request that their children's data not be included in the study.

Author Contributions

All authors listed have made a substantial, direct and intellectual contribution to the design of the work, analysis and data interpretation, drafting and revising it critically and approved it for publication.

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5 STRATEGY LEARNING OR UNDERSTANDING READER RESPONSE? AN EVALUATION OF TWO APPROACHES TO DEVELOPING SIXTH-GRADE STUDENTS' WRITING THROUGH REVISION INSTRUCTION

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López, P., Torrance, M., Rijlaarsdam, G., & Fidalgo, R. (2019). Strategy learning or understanding reader response? An evaluation of two approaches to developing sixth-grade students' writing through revision instruction. *Manuscript submitted for publication.*

Este capítulo ha sido eliminado provisionalmente de la tesis por encontrarse en proceso de publicación.

6 HOW TO REPORT WRITING INTERVENTIONS? A CASE STUDY ON THE ANALYTIC DESCRIPTION OF TWO EFFECTIVE REVISION INTERVENTIONS

This chapter is based on:

López, P., Rijlaarsdam, G., Torrance, M., & Fidalgo, R. (2018). How to report writing interventions? A case study on the analytic description of two effective revision interventions. *Journal of Writing Research*, *10*(2), 279-329. doi:10.17239/jowr-2018.10.02.05

Abstract

In this study we present a comparative report of two effective instructional programs focused on the improvement of upper-primary students' writing competence through the promotion of revision skills. Both programs shared the main aim but had two different approaches. We contrasted writer-focused instruction with reader-focused instruction. To provide a valid report on the similarities and differences of the two programs, we applied two complementary dimensions. The first dimension, what the researcher intends students to achieve, provides insight into the types of students' intermediate learning objectives and how they are sequenced. The second dimension, how to teach, includes the instructional design principles which relate the intermediate learning objectives to the specific learning and instructional activities in certain conditions. We analyse similarities and differences between the instructional programs and discuss the implications of using this kind of reporting system as a useful tool for reporting – and designing – writing interventions.

Keywords: Learning activities; Design principles; Revision instruction; Strategy-focused instruction; Reader-focused instruction

Introduction

In recent decades, writing research with proficient and novice writers has produced valuable insights into the processes and variables involved in skillful composition (Flower, 1979; Flower & Hayes, 1981; Graham, 2006a). While our understanding of how writing develops is certainly not complete, there is general agreement that the long road from novice to competent writer is strongly influenced by changes in students' self-regulatory or strategic behaviours, writing knowledge, writing skills, and motivation (Alexander, Graham, & Harris, 1998; Graham, 2006a). Since children do not acquire these complex writing skills or knowledge incidentally (Flower & Hayes, 1981), they need high-quality writing instruction (Graham, McKeown, Kiuhara, & Harris, 2012).

Many intervention studies looking at improving these critical areas have confirmed the effectiveness of different kinds of instruction at different ages and in various student populations. This is reflected in meta-analyses that shed light on the comparative effects of different instructional approaches on writing (Graham, 2006b; Graham et al., 2012; Graham & Sandmel, 2011; Koster, Tribushinina, De Jong, & Van den Bergh, 2015). Despite meta-analyses being critical to identifying the most effective instructional practices for improving students' writing competence, they do not provide comprehensive information about the instructional approaches tested. Moreover, the treatments analysed include various instructional components and content aimed at promoting the acquisition of different skills, knowledge, and increasing students' motivation. Therefore, it is difficult to determine what the critical variables are that contribute to students' growth as writers, and how these variables were operationalised in the studies. From just a clear description and operationalisation of skills or knowledge taught during interventions it would be possible to design comparative studies to test the effect of specific variables or to analyse possible differential effects of different learning sequences in a single instructional program. Those comparative studies would provide insights about whether a specific differential target skill or knowledge taught is critical for improving students' writing competence or whether there is an optimal sequence of learning activities. This would undoubtedly contribute to further development of writing theories. Therefore, we propose that an intervention report be built upon two dimensions:

1. The *content dimension* in terms of the sequence of intermediate learning objectives: this is the design of the learning path; the design of what should be achieved and in what order.
2. The *instructional dimension* in terms of learning activities that contribute to each of these intermediate learning objectives, and the instructional conditions to evoke, stimulate and guide these learning activities.

We will outline and apply a reporting system that includes four elements: one to report the content dimension as the intended intermediate learning objectives, and three to report the instructional dimension as design principles, learning and instructional activities. We adopted these elements from the system proposed by Rijlaarsdam and colleagues (Rijlaarsdam, Janssen, Rietdijk, & van Weijen, 2018, page 307-309), although the focus in that system was the design and definition of learning activities, and the intermediate learning objectives were hidden behind these learning activities. We will bring these outcomes to the foreground in the design and report process since it is the first choice to be made when designing an intervention.

The first report element, describes the intended specific Intermediate Learning Objectives (ILO). These should be formulated from a student's perspective and may be specific knowledge (e.g., students have access to metacognitive knowledge about a certain writing process), attitudes/motivations (e.g., students are willing to invest time and effort in revising texts) or skills (e.g., students can apply/have acquired a self-regulation procedure to guide and monitor the revision process) in the intervention. These are intermediate objectives (e.g., students should acquire procedural knowledge about the revision process) as they support the achievement of the final learning outcome (e.g., improving the quality of students' texts). These intermediate learning objectives must be described in operational terms such that they can be observed or measured, directly or indirectly. For example, if the intended intermediate learning objective is the acquisition of procedural knowledge about the revision process, it will be necessary to describe how the revision has been operationalised, based on a particular theoretical framework (e.g., Bereiter & Scardamalia's CDO – Compare-Diagnose-Operate – model, 1987). We must also describe how we can observe in the learning materials that students were indeed acquiring this knowledge, for instance from recordings of students thinking aloud during revision practice, or from work book analysis. Reporting the intended sequences of

intermediate learning objectives is crucial, because it sheds light on the concept of the target writing skill from an acquisition perspective.

The other three report elements constitute the how-to-teach dimension. They provide insight into the instructional design for achieving each of these intermediate learning objectives.

The second report element refers to the intervention Design Principles (DP). These principles define the intervention in that they establish the parameters required to achieve the set of specific intermediate learning objectives. These principles should be based on theoretical insights or empirical findings and they should be defined as means-end-relationships (e. g. If you –instructional designer or researcher – want to achieve outcome Y you should probably create X). According to Reigeluth (1999), design principles are probabilistic, which means that when they are appropriately applied, the proposed goal is more likely to be achieved. Design principles create the space for instructional designers to plan learning and instructional activities that are in line with those principles.

The third report element includes the specific Learning Activities (LA) that represent the operationalisation of the previously established design principles. According to Rijlaarsdam et al., (2018), learning activities are defined as any activities a researcher/instructional designer sets for an individual that contribute to the acquisition of knowledge, skills and competencies. They must be intentional, and have a predetermined purpose. In an intervention learning activities are mediating variables between the instructional act and the intermediate learning objectives. Therefore, in instructional design it is critical to select the most suitable learning activities for the intermediate learning objectives.

The fourth report element describes specific Instructional Activities (IA) or tasks to engage learners in the proposed learning activities. The designer selects or creates the most suitable instructional activities and specific conditions that will stimulate the intended learning activities. This choice is particularly important when adapting or contextualising instructional practice to students' needs and educational contexts. See Figure 1 for a graphical representation of the proposed reporting system.

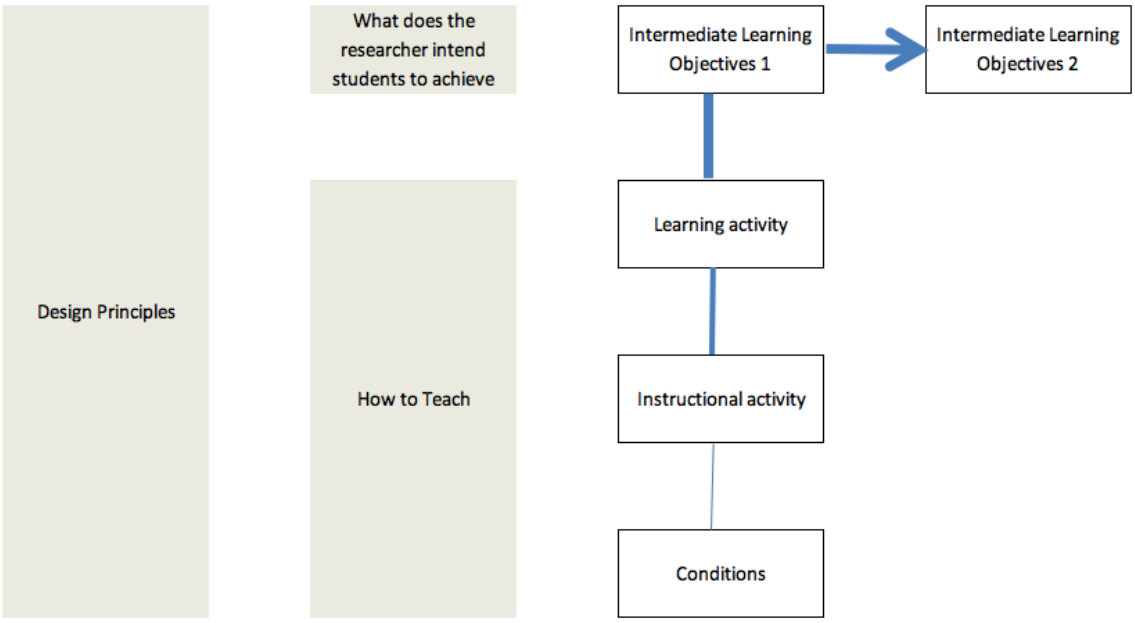

Figure 1. The intervention construct: two dimensions, four elements, and probabilistic relations (the relative width of a line represents the relative weight of the probabilities)

The resulting intervention report would therefore start with the definition of the series of specific Intermediate Learning Objectives expected as a means to achieving the final intervention learning outcome. This part is related to the what the researcher intends students to achieve dimension. Then we move on to define the intervention Design Principles. A design principle relates the intermediate learning objective to the best choice of Learning activities and Instructional activities given the circumstances (learners' prior competences, instructional and situational constraints), to ensure the achievement of the proposed intermediate learning objectives. The connection between learning activities and intermediate learning objectives is probably stronger (a key choice), than the relationship between learning and instructional activities (i.e. several instructional activities may lead to the same learning activity) or contextual factors (i.e. conditions are highly dependent on the context). This is illustrated in Figure 1 by the relative thickness of the connecting lines.

The present study

The main goal of the present study is to provide a comparative report of two intervention programs we tested which concentrated on the improvement of upper-primary students' writing competence through the promotion of revision skills. We apply

the proposed reporting system, using the two dimensions, and addressing the four elements.

First, we provide context for the interventions with a short overview of the study which shows that both instructional programs were effective in improving the quality of 6th graders' texts and revision skills. The study is currently in the process of publication (López, Torrance, Rijaarsdam, & Fidalgo, 2018). We then present the comparative report of the two instructional programs as a demonstration of our proposed approach for reporting comparative or concurrent interventions in writing studies.

Overview of the Empirical Study

We analysed the effects of two interventions to improve upper-primary students' written competence in their first language (Spanish) by promoting revision skills. There were two different instructional approaches: writer-focused instruction and reader-focused instruction. The sample was made up of six mixed ability classes from two schools with similar academic and socio-economic characteristics, and comprised 107 sixth-grade Spanish students. Classes were randomly allocated within each school to one of the three conditions. All three conditions started with learning to set communicative goals at the starting point of writing. The control condition did not receive any kind of instruction in revision.

The writer-focused instruction aimed to teach students explicit strategies for regulating their own revision behaviour, introducing between-draft revision procedures. The instruction in this condition was based on the assumption that revision is a complex process that requires substantial metacognition and self-regulation (Bereiter & Scardamalia, 1987; Hayes & Flower, 1980; Zimmerman & Risemberg, 1997).

The reader-focused instruction centred on providing students with the opportunity to observe and learn how readers respond to imperfect texts, making them aware of their audience and learning what the reading process entails as the driving force for revising their own texts. This condition was based on the assumption that developing writers have difficulty in taking the perspective of their readers, something which is critical for effective revision (Bereiter & Scardamalia, 1987; Hayes, Flower, Schriver, Stratman, & Carey, 1987; Sommers, 1980). All programs involved four sessions over four consecutive weeks, each lasting about 50 to 55 minutes.

The dependent variables were composition quality and revision skill. As measurements, we assessed composition and revision competence immediately before and immediately after the intervention, and two months later. The tasks dealt with argumentative texts, the topics of which were familiar to students, so they did not need additional information to complete the tasks (The captivity of wild animals in the zoo: For or against?; New technologies: For or against?; Reading books: For or against?). The topics were evenly distributed between test and control conditions and the different assessment points. Written composition performance was assessed at each evaluation and the transfer task through overall ratings of quality measures such as goal orientation, audience focus, structure, and language use (Van den Bergh & Rijlaarsdam, 1986). Revision performance was assessed in terms of students' ability to detect and remedy various surface and substantive problems in a researcher-designed text. Using a researcher-designed text minimised differences in this variable due to variation in the quality of the students' own texts. Participants also completed a post-intervention composition task assessing the transfer effect in which students wrote an instructive text, a text type that had not been taught during the intervention.

We found evidence of immediate and sustained benefits for all composition quality measures and revision skills, as well as a transfer effect to another text type for both experimental conditions. We found no significant differences between the two experimental conditions.

At this point, what matters to us is whether the proposed system of intervention analysis helps us, in retrospect, to understand the success of the two different interventions.

There are two basic questions when analysing the instructional programs: (1) the analysis of the contrasts between the two experimental conditions must show that the conditions are indeed representing two different constructs, and (2) the analyses must show that interventions only differ in the intended contrast variable, with the other elements being similar. In the case of two concurrent experimental interventions, the designer must balance the similarities and differences: varying one element in two interventions must still be in balance with the intervention as a whole. The embedding of the key difference must be optimal in both conditions.

We expect that an in-depth analysis would allow a critical analysis and comparison between the interventions according to what the researcher intended students to achieve and how it was taught. From this analysis, the validity of the interventions can be examined, as well as the instructional sequence followed in each condition. This will also allow us to clearly establish to what extent the interventions differed. Additionally, the analysis will suggest future studies in which different contrasts between interventions or the reconsideration of some elements may be considered.

Comparative Analysis of the "Reader-focused instruction" and "Writer-focused instruction" Programs

In this section we present a comparison between the interventions in the experimental conditions, using the proposed reporting system. We will not include the control condition intervention in this comparison because we want to focus on the comparative analysis of two similar interventions.

Dimension 1: What Does the Researcher Intend Students to Achieve

Both instruction programs share intermediate learning objectives, considered critical aspects of effective revision, while other objectives are condition-specific, representing the theoretical assumptions of the two versions of the revision learning conditions (see Table 1).

Table 1

Overlapping and condition-specific intermediate learning objectives of both interventions in sequence (Students should…)

Writer-focused instruction	Both	Reader-focused instruction
	1. have acquired metacognitive knowledge about what revision processes are, and about when and how to revise	
	2. be able to formulate specific product goals linked to high quality-texts and specific audience responses	

3A. have access to procedural knowledge about how to revise their texts through the use of evaluative criteria to detect problems and correct them based on different textual aspects 3B. be able to achieve self-regulated control in the use of the revision strategy taught		3. have access to knowledge of how readers respond to imperfect texts, through consideration of the evaluative criteria previously taught and reader feedback about possible actions to improve texts
	4. have internalised/proceduralised the knowledge acquired during the intervention	

Metacognitive knowledge about the revision processes is critical for revision (MacArthur, 2012; 2016), as is setting goals (Hayes & Flower, 1980) in which evaluation criteria are considered (Fitzgerald, 1987). Therefore, both instructional programs started with the same two intermediate learning objectives, the students' acquisition of this metacognitive knowledge and the skill to set communicative goals linked to evaluation criteria (Table 1, Intermediate learning objectives 1 and 2).

First, students should have acquired metacognitive knowledge about what revision processes are, and about when and how to revise. Such knowledge plays a critical role in the revision process (MacArthur, 2012; 2016). One of the most important factors influencing revision is that students do not understand that revision entails more than just correcting surface errors in the text (Hayes, Flower, Schriver, Stratman, & Carey, 1987). The metacognitive knowledge taught in both programs was based on the view of revision as an evaluative, problem solving process in which the writer should detect, diagnose and correct the dissonances between the intended and the actual text (Bereiter & Scardamalia, 1987; Hayes et al., 1987).

The second intermediate learning objective was about goal setting: students should be able to formulate specific communicative goals. Communicative goals are understood as goals that the writer establishes both in terms of the text produced and considering the audience (cf., Midgette, Haria, & MacArthur, 2008). These

communicative goals were the starting point of the revision process and included evaluative criteria linked to high-quality texts. Several studies have shown that even brief interventions instructing students in the use of revision goals linked to evaluative criteria have positive benefits in their understanding of the purpose of revision (De la Paz, Swanson, & Graham, 1998; Graham, MacArthur, & Schwartz, 1995; Wallace & Hayes 1991), as well as their consideration of their audience (Midgette, et al., 2008). The third intermediate learning objective was different in the two instructional programs.

The writer-focused instruction program had two specific intermediate learning objectives (Table 1, Intermediate learning objectives 3A and 3B). Students should acquire procedural knowledge about how to revise their texts through the consideration of evaluative criteria to detect problems and correct them in their texts to improve text quality. The students' ability to revise, and particularly to implement higher-level revisions of meaning and text structure, is affected by their knowledge of the processes involved in revision and evaluation criteria (Englert, Raphael, Anderson, Gregg, & Anthony, 1989; Hayes, 1996). Additionally, students should achieve self-regulated control when using the knowledge previously taught through the use of a revision strategy. The complexity and cognitive demands of the process of composition explains why skilled writing requires high levels of self-regulation (Graham & Harris, 2000).

The reader-focused instruction had a different intermediate learning objective (Table 1, Intermediate learning Objective 3): students' knowledge of how readers respond to imperfect texts, through the consideration of evaluative criteria linked to goal setting, and reader feedback about different actions to improve texts aimed at encouraging student's revision. One possible reason why children rarely revise their texts is because developing writers are often unaware of the communicative deficiencies of those texts (Hayes & Flower, 1980; Beal, 1990; Sommers, 1980). The ability to take the perspective of the reader seems to be critical for effective evaluation and revision (Nystrand, 1986).

Finally, both learning conditions aimed for students to internalise/proceduralise the use of the knowledge acquired during the intervention (Table 1, Intermediate learning objective 4). Students had to apply and integrate the new knowledge in real, meaningful tasks to ensure significant learning (Ausubel, 1968).

Dimension 2: How to Teach

We present detailed information in summary tables showing commonalities (Table 2) and differences between the two intervention programs (Table 3 for the writer-focused program, and Table 4 for the reader-focused program). Additionally, we explain the instructional sequence followed according to the proposed reporting system and highlight those aspects relevant to the interventions and the rationale for the system.

The instructional design used for the first two intermediate learning objectives was the same in both conditions (see Table 2). The first intermediate learning objective, – the acquisition of metacognitive knowledge about the revision process – was sought through a design principle focused on providing students with the opportunity to activate their prior knowledge about the revision process, providing them with new information about what revision processes entail and when and how to revise. It also provided them with the opportunity to integrate that into their existing knowledge. This design principle was based on Ausubel's theory (1968), which claims that significant learning can only occur when learners examine their prior knowledge before learning something new and connect the new information to their existing knowledge. This design principle was operationalised through a set of learning and instructional activities centred on the activation of prior knowledge about the revision process through asking questions and whole-class discussion, and actively processing and memorizing the new information about the revision process through explicit instruction performed under specific conditions to stimulate a positive outcome (see Table 2, ILO 1, DP 1, LA 1.1 and 1.2; IA 1.1 and 1.2).

Table 2

Commonalities of the two instructional programs according to the four levels of the proposed reporting system

Intermediate learning objectives (ILO)	Design principles (DP)	Learning activities (LA)	Instructional activities (IA) and implementation conditions
1. Acquire metacognitive knowledge about what revision processes are, and about when and how to revise.	1. Give students the opportunity to activate their prior knowledge about the revision process, provide them with new knowledge about what the revision processes are, when and how to revise, and give them the opportunity to integrate that into their existing knowledge.	1.1 Students activated their previous knowledge about the revision process, remembered and reflected on their own knowledge, limits and gaps about what the revision process is, and how to do it, the importance of doing it, if they do it, what kind of aspects they usually revise and so on through individual brainstorming and sharing these ideas in a whole-class discussion.	1.1 The instructor asked questions and promoted a whole-class discussion based on students' responses about what the revision process is, how to do it, the importance of doing it, if they do it, what kind of aspects they usually revise and so on (e.g., what do you think the revision process is? How do you revise your texts? Do you all revise your texts in the same way?). *Implementation conditions:* - The sessions were implemented in the classroom to ensure that students felt safe. - The instructor introduced the instructional program explaining the importance and necessity of writing well, referring to aspects close to the student (e.g., making them aware that the way in which they express themselves in writing in an exam, for example, influences the marks they get in some subjects). -The instructor promoted the activation of prior knowledge through questions (e.g., What is the revision process?; What aspects do we have to take into account when revising a text?). At this point the instructor encouraged students to answer, emphasising that there were no wrong answers. - The instructor tried to involve all the students, making them actively participate in the whole-class discussion. If any of the students did not participate, the instructor asked them directly (e.g.,"Jorge, do you also check just the spelling when revising as Sara just told us?").

		1.2 Students *read* a summarising table, *answered* questions, *listened* and *memorised* the new information about what the revision process is, how, when, and why to do it and *integrated* that into their previous knowledge through the comparison between their own knowledge and the new information: differences, similarities, previous misunderstandings and so on.	1.2 The instructor provided students with a summary table and asked some students to read the information aloud for the whole class. The instructor noted the important aspects about (a) what is revision (key process to write good quality texts), (b) how to revise (detection and correction processes mainly focus on structure, organisation and meaning errors) and (c) when and why to revise (always after the first draft with the aim of improving the quality of the text), relating that to the students' previous responses. *Implementation conditions:* -The instructor supported the revision explanation with a summary table about the revision process (what it is, how to do it and when and why do it). -The instructor explicitly referred to students' previous ideas and examples emphasising the differences between their previous knowledge and the new information, discussing misunderstandings, and so on (e.g., Remember that you said that you only checked spelling issues in your texts, according to what we have just read we have to take into account many more things like structure, organisation... etc.).
2. Formulate specific communicative product goals linked to evaluative criteria related to good quality texts in order to produce specific audience responses.	2. Provide students with a specific strategy that helps them to formulate communicative product goals linked to evaluative criteria intended to produce specific audience responses as a first step in their writing process.	2.1 Students *read* a worksheet with information about the INCA strategy and setting communicative product goals, *participated* actively in a classroom discussion in which students shared ideas about what	2.1 The instructor instructed students explicitly in the INCA strategy to set communicative product goals during planning linked to evaluative criteria and reader responses. The INCA strategy showed the steps that students should consider in order to set communicative goals (Introduction-Nudo [development]-Conclusion-Aspecto [Form]). Each step was explained according to the kind of goals that students should set in the form "I should do X with the aim to produce Y in the reader (e.g., for a

	goals could be set at each step of the strategy, *memorised* the INCA strategy and *reflected* on evaluative criteria related to good quality texts and audience responses.	communicative goal for introduction "I should present the topic in an attractive way to keep my teacher's attention"). *Implementation conditions:* - The instructor used a specific mnemonic (INCA) to support students' memorisation and retrieval of the strategy for setting communicative goals. - The instructor provided students a worksheet in which students could see the strategy and examples of different communicative goals for each of the steps of the strategy. - The instructor promoted the memorisation of the strategy through playful activities (e.g., the instructor wrote the letters of the strategy on the blackboard and the students had to say what it meant. The instructor wrote the letters out of sequence or skipped steps and the students quickly corrected the errors).
	2.2 Students *analysed* and *reflected* on different communicative goals linked to specific audiences and evaluated to what extent the goals were suitable for the audience considered	2.2 The instructor provided examples of specific communicative goals aimed at specific audiences, linked to real writing texts (texts that included typical sixth graders errors). *Implementation conditions:* - The instructor provided students with different worksheets in which different familiar audiences (teachers-children-parents...) were considered to encourage students to empathise with different audience needs and responses and check to what extent the goals met the needs of the audience.
	2.3 Students applied the steps of the strategy to set goals, internalised the use of the strategy and evaluated possible misunderstandings about the use of the	2.3 The instructor provided pre-planning activities to set communicative goals for specific audiences. *Implementation conditions*: - The instructor provided students a writing assignment in which they had to set communicative goals following the INCA strategy as a homework task. Familiar topics were considered which were

		strategy, the meaning of a step, how to set the goals and so on.	motivating for the students (e.g., write a text to convince your parents to have a pet at home).
4. Students should internalise/proceduralise the knowledge acquired during the intervention.	4. Provide students with opportunities to apply the knowledge acquired in meaningful tasks with real communicative goals and audiences and compare that with model texts.	4.1 Students *revised* a previously written text, based on the establishment of communicative goals, through the application of the knowledge acquired during the intervention and *wrote* a final version of the text.	4.1 The instructor gave students the opportunity to practice through tasks where students revised their own writing products collaboratively. *Implementation conditions:* - The instructor activated and reminded students of their knowledge acquired in previous sessions and prompted its application to the tasks. - Each student within a pair received the role of writer or helper. The writer was in charge of carrying out the task by verbalising all his actions (as similar as possible to the model). The helper monitored the writer's actions. Roles were swapped between sessions 2 and 3. - The instructor provided help when needed and gradually faded scaffolding and feedback in order to promote interiorisation and independent use of the knowledge acquired.
		4.2 Students *revised* a researcher-created text, based on the establishment of communicative goals, through the application of the knowledge acquired during the intervention and *wrote* a final version of the text.	4.2 The instructor gave students the opportunity to practice through tasks where students individually revised a researcher-created text. *Implementation conditions:* - The instructor activated and reminded students of their knowledge acquired in previous sessions and prompted its independent application to the task. - The instructor provided help when needed and gradually faded scaffolding and feedback in order to promote interiorisation and independent use of the knowledge acquired.

	4.3 Students *analysed* high-quality texts and *compared* them with their own texts, integrated the information and *reflected* on differences between texts.	4.3 The instructor gave students opportunities to compare the outcome of their revision process implemented according to knowledge they acquired with the outcome of an expert's revision of the same text. *Implementation conditions:* - The instructor promoted students' analysis of the expert and their own texts through questions (e.g., Do you think there is any difference between your text and the one you just read? Which text is easier to read and why?). - The instructor promoted students' reflection about the importance of applying their acquired knowledge, its positive effects, and encouraged them to use the knowledge acquired (e.g., If you use the knowledge you acquired during the instruction program to revise your own text, you will get great results as you can see in the model text) as well as promoting generalisation (e.g., Do you think that what you have learned can only be applied to writing argumentative texts? Would it also be useful for other types of writing?).

The second intermediate learning objective concentrated on the formulation of specific communicative goals linked to evaluative criteria. This objective was sought through a design principle focused on providing students with a specific strategy to help them formulate communicative goals as the first step of writing, including evaluative criteria. These communicative goals were also linked to the revision process. Setting communicative goals and relating them to the revision process allows students to revise their work, comparing what they wrote with what they wanted to say to the reader (Bereiter & Scardamalia, 1987). Those goals were set according to specific evaluation criteria. Evaluation criteria are a critical aspect of goal setting for revision (De la Paz et al., 1998). This design principle was operationalised through a set of learning activities and instructional activities focused on memorisation of the INCA strategy to set communicative goals linked to evaluative criteria. This was taught through explicit instruction, reflection and analysis of different communicative goals linked to specific audiences from different examples and applying the strategy to set goals in pre-planning activities (See Table 2, ILO 2, DP 2, LA 2.1, 2.2 and 2.3 and IA 2.1, 2.2 and 2.3). Each letter of the INCA strategy (in Spanish) represents one of the four steps that students need to consider to set their goals according to the evaluative criteria linked to each step. "I" means introduction (e. g., goals "I need to introduce the topic "have pets at home" in an attractive way to get my parents' attention"), "N" (nudo, which means "knot" in Spanish) means development (e. g., goals "I am going to write every reason with a clear example to convince my parents about having pets at home"), "C" means conclusion (e. g., goals "I am going to remind my parents that I completely agree with having pets at home to show them that it is beneficial for me") and "A" (aspecto: aspect in Spanish) means form (e. g., goals "I need to use paragraphs to make it easy for my parents to read").

The third intermediate learning objectives were different in the two intervention programs. The predominant mode of instruction in both programs was observational learning complemented by explicit instruction (see Table 3 and 4).

Table 3

Summary table with the differential aspects of the writer-focused instruction program according to the four levels of the proposed reporting system

Intermediate learning objectives (ILO)	Design principles (DP)	Learning activities (LA)	Instructional activities (IA) and implementation conditions
3A. Acquire procedural knowledge about how to revise their texts through the use of the evaluative criteria to detect problems and correct them, linked to different aspects of the text.	3A Provide students with a specific revision strategy that guides them in the revision process in which they detect problems through the evaluation criteria provided and correct the detected problems through different actions (e.g., add, delete, reorganise, change) following the steps of the strategy.	3A.1 Students *read* a worksheet with an explanation of each step of the PIENSO strategy and the evaluative criteria related to each step, *listened to* and *memorised* the information linked to the strategy and the processes that should be followed (detection and correction) to revise their texts.	3A.1 The instructor explained, and gave explicit instruction in the PIENSO revision strategy which considers the steps and the evaluative criteria that students should consider to detect and correct mistakes when they revise their texts (Planes iniciales [initial goals]-Ideas-Estructura [Structure]-Syntax-Ortografia [Spelling]). *Implementation conditions:* -The instructor promoted students' activation of prior knowledge about revision and the need to set goals through questions (e.g., what did we learn the day before about the revision process, is it just checking spelling? why is it important to set goals? what strategy can we use to set goals?). - The instructor used a specific mnemonic (PIENSO) to support students' memorisation and retrieval of the strategy for revising/ - The instructor provided and supported the PIENSO strategy explanation with a worksheet in which students could see the strategy with a detailed explanation of each step.
		3A.2 Students *memorised* the strategy and the specific steps to follow according to	3A.2 The instructor gave students the opportunity to practice memorisation of the PIENSO strategy through playful activities (e.g., the instructor identifies the steps and the students have to detect errors in the sequence, "*The first step is the I of Ideas*" and students should identify that it is not correct).

		the PIENSO revising strategy.	*Implementation conditions:* - The instructor provided students with enough opportunities to memorise the strategy and made sure they had memorised the strategy before continuing the program (e.g., the instructor asked questions about the sequence of the strategy and the meaning of each letter "*What is the first letter of the strategy?, What is the meaning of the letter E?").*
3B. Achieve self-regulated control in the use of the previously taught revision strategy.	3B. Provide students with the opportunity to observe a writer applying a revision strategy in a self-regulated way.	3B.1. Students *observed* a model applying the strategy while thinking aloud to revise an imperfect text, *acquired* knowledge about how to regulate the strategy execution and the actions to revise a text.	3B.1 The instructor provided students with cognitive modelling while thinking aloud in front of the class emphasising the steps of the PIENSO strategy to revise different quality texts, applying actions to improve text and regulating their own revision behaviour through self-questioning (e.g., *what is the next step? What can I do to solve this problem?*), self-instructions (e.g., *now I should carefully revise my text following the PIENSO strategy*), self-directive statements associated with the specific steps of the strategy and the specific self-regulatory processes (e.g., *The next step is E and I should revise the structure of my text*) and motivational aspects (e.g., *It is boring, but it is worth making the effort, My texts looks really good now after using the PIENSO strategy*). *Implementation conditions:* - The instructor modelled the revision of different quality texts, which included sixth graders typical errors. - The instructor used dramatisation and changes in the tone of voice and rhythm to keep students' attention or emphasise key aspects during modelling (e.g., the steps of the strategy, possible actions to solve the detected problems). - The instructor provided students with a familiar model, that is, a student model including colloquial expressions to encourage the students' interest and attention

		- The instructor focused students' attention and retention on the model: the revision process, the evaluation criteria used, the actions taken to solve problems and the kind of thoughts as self-instructions, questions and motivational beliefs emphasising these steps. - The instructor prevented students from doing any other concurrent task during observation of the modelling (e.g., taking notes, asking questions).
	3B.2. Students *reflected* on their observations by analysing actions and thoughts of the model, and *integrated* their new knowledge.	3B.2 The instructor gave students the opportunity to individually take notes after the modelling, then organised a whole-group discussion to share student reflections and emphasise the key aspects of the model's actions and thoughts. *Implementation conditions:* - The instructor guided students in their reflection through questions focused on the model revision process, evaluation criteria and thoughts (e.g., Did the writer apply the PIENSO strategy to revise his text? Did he follow all the steps? Did his text improve much?). The instructor only guided the questions, with no explicit instruction about the information.

In the writer-focused program (Table 3) the specific third intermediate learning objective was for students to acquire procedural knowledge about how to revise their texts through the use of the evaluative criteria provided in the previous stage, to detect problems and correct them, linked to different aspects of the text. The design principle was to provide students with a specific revision strategy that would guide them in the revision process, in which they detect problems through the evaluation criteria provided and correct those problems through different actions (e.g., add, delete, reorganise, change) following the steps of the strategy. Instruction was designed to enhance students' knowledge of evaluation criteria and the processes involved in revision. Students' understanding of revision goals has positive effects on the acquisition of revision skills and improvement in text quality (Fitzgerald & Markham, 1987).

This design principle was operationalised through learning activities in which the students read a worksheet with an explanation of each step of the PIENSO strategy and the related evaluative criteria. Students listened to and memorised the information linked to the strategy and the processes they should follow (detection and correction) to revise their texts through direct instruction and playful activities (see Table 3, ILO 3A, DP 3A, LA 3A.1 and 3A.2 and IA 3A.1 and 3A.2). Each letter of the revision strategy PIENSO (I Think in Spanish) signifies the steps that writers should consider when revising their texts. P means Planes iniciales (initial goals), Ideas (content), Estructura (text structure), Nexos (links – the use of cohesive ties between sentences and paragraphs), Sintaxis (sentence-level grammar), and Ortografía (spelling). Students were instructed to read through their drafts, focussing on whether or not they felt it met their goals (Planes iniciales), previously identified via the INCA procedure, and make the necessary changes if not. Then they read and revised again for Ideas, and so on through the PIENSO steps.

The writer-focused program included a second additional intermediate learning objective which was the achievement of self-regulated control in the use of the previously taught revision strategy. The design principle centred on giving students the opportunity to observe and evaluate a writer applying the revision strategy taught in the previous intermediate learning objective following a self-regulatory approach. According to the social cognitive model of sequential skill acquisition (Zimmerman, 2000; 2002) the first phase by which students can develop self-regulation skills is observation. An effective way to operationalise the design principle set is through learning and instructional

activities focused on observational learning from cognitive modelling and reflection about the model's actions and thoughts from taking notes and whole-class discussion. Although the conditions in which all learning and instructional activities are carried out are always important, they seem to be even more so in the case of observational learning. The effectiveness of this learning activity seems to be highly dependent on the conditions in which it is carried out (Braaksma, Rijlaarsdam, & Van den Bergh, 2002) so it is important to control the application conditions to ensure a positive outcome. For example, before starting the modelling the instructor made the general intention of the modelling clear and highlighted the need to pay special attention to critical aspects such as the revision process the model followed, the evaluation criteria used, the actions performed to solve problems and thoughts such as self-instructions, questions and motivational beliefs the model exhibited during the observational task. This was also the content of the reflection phase. Another important condition to ensure a positive outcome is the model should be familiar to the student. In this experimental condition the model acted as a student applying the PIENSO strategy to revise their own text. In addition, in order to engage the students' attention, the model included changes in tone, used expressions typically used by students at this age and so forth. Finally, concurrent tasks were avoided during the modelling to ensure the students were completely focused on the observational activity (e.g., avoid students taking notes) (See Table 3, ILO 3B, DP 3B, LA 3B.1 and 3B.2 and IA 3B.1 and 3B.2).

In the reader-focused instruction (Table 4) the third intermediate learning objective was to improve students' knowledge of how readers respond to imperfect texts, considering evaluative criteria through goal-setting and reader feedback about possible actions to improve texts. This was done via a design principle based on the rationale that students' revision ability is influenced by what they know about readers. More specifically, students should know how readers think while they read and evaluate imperfect texts, and should think about different aspects that affect the reading process, and provide possible solutions to those problems. This rationale was based on studies that have demonstrated the potential value of observing readers as an input for revision (for a review see Rijlaarsdam et al., 2008; Moore & MacArthur, 2011).

Table 4

Summary table with the differential aspects of the reader-focused instruction program according to the four levels of the proposed reporting system

Intermediate learning objectives (ILO)	Design principles (DP)	Learning activities (LA)	Instructional activities (IA) and implementation conditions
3. Acquire knowledge about how readers respond to imperfect texts, through the consideration of previously taught evaluation criteria and reader feedback about possible action to improve texts.	3. Give students the opportunity to observe real reader(s) thinking aloud when reading and evaluating imperfect texts providing comments about how to solve problems.	3.1 Students *activated* prior knowledge about the need to consider the audience, *reflected* on their own knowledge, limits and gaps, about why it is important to consider the audience when writing and revising.	3.1 The instructor asked questions about the consideration of the audience when writing (e.g. ‚Is writing a text for your teacher the same as for a classmate?), engaged students in brainstorming about it and prompted a whole-class discussion based on student responses about consideration of the audience when writing, its importance, if they do it, how, and so on. *Implementation conditions:* - The instructor created a safe classroom context in which students felt safe to actively participate. -The instructor promoted the activation of prior knowledge through questions. At this point the instructor encouraged students to answer, emphasising that there were no incorrect answers. - The instructor tried to involve all the students, making them actively participate in the whole-class discussion. If any of the students did not participate, the instructor asked them directly (e.g., Do you think it is the same to write a text for your parents as it is for your teacher? What is the difference?).
		3.2 Students *observed* a model acting as a reader, responding and evaluating from imperfect texts	3.2 The instructor provided students with cognitive modelling showing positive and negative reader evaluation responses when reading texts of various quality levels and provided suggestions about how to improve texts (e.g., “but this reason is exactly the same idea as the first reason given. If I were him I would remove it”, “It is not clear why social networks are addictive, maybe if he explained it with more information I could understand it better”). *Implementation conditions:*

	and providing different options to solve the problems.	- The instructor provided students with different models, such as teachers, children and parents, to provide students different audience responses. - The instructor modelled the reader's evaluation process of texts of different quality which included problems and errors typical of sixth graders. - The instructor used dramatisation and changes in the tone of voice and rhythm to hold students' attention or emphasise key aspects during modelling (e.g., different audience responses, possible actions to solve the problems they found) - The instructor focused students' attention and retention on the information provided by the reader (e.g., what kind of things make the reading easy or difficult, what were the evaluation criteria the reader used, what kind of solutions the reader suggested for the issues detected and what were readers' affective responses). - The instructor focused attention on the model avoiding students doing any concurrent tasks (e.g., taking notes, asking questions).
	3.3. Students *reflected* on the information provided by the reader, *analysed* the actions and thoughts of the reader during the task, and *integrated* the information.	3.3 The instructor provided students with the opportunity to individually take notes after the modelling and then discussed it in a whole-class discussion. *Implementation conditions:* - The instructor guided students in reflection through questions aimed at audience emotional responses, reader evaluation criteria and the kind of suggestions provided to improve texts (e.g., What aspects negatively affected the reading? What were the reader's feelings about the negative aspects? What solutions did the reader suggest?). The instructor only guided the plenary discussion questions, with no explicit instruction about this information at any time.

This design principle was operationalised through a set of learning and instructional activities which included activating prior knowledge about the need to consider the audience when writing and especially revising through questions and whole-class discussion in which students shared ideas. The students also observed cognitive models of readers reacting and evaluating imperfect texts, providing problem-solving options, and then thought about the modelling they had seen. In this experimental condition, modelling was performed in a similar way to the writer-focused condition but adapted to the reader-focused approach. For example, before starting the modelling the instructor made the aim of the observational activity clear. The instructor also emphasised that students should pay attention to what kind of things made the reading easy or difficult, the evaluative criteria used by the reader, the solutions the reader proposed, and the readers' affective responses, which was also the object of the reflection phase. Here, instead of giving students a student model, we included different kinds of models in order to give students responses from different audiences (e.g., parent, teacher, student). During the modelling, the model engaged the students' attention in the same way as in the writer-focused condition through the inclusion of changes in tone, expressions typically used by students at this age and so on. Finally, once again, during the modelling, concurrent tasks were avoided in order for the students to be completely focused on the observational activity (e.g., students were asked not to take notes) (see Table 4, ILO 3, DP 3, LA 3.1, 3.2 and 3.3 and IA 3.1, 3.2 and 3.3).

The same instructional technique, cognitive modelling, was used to achieve different intermediate learning objectives. In this study modelling was thought to provide students with procedural knowledge about how to regulate the revision process as well as to give them knowledge of the communicative effectiveness of their writing. The key difference in the application of this technique in the two learning conditions was the approach used: a writer applying a strategy or a reader evaluating a text. In the writer-focused instruction, students watched a model emulating a student applying the PIENSO strategy to revise an imperfect text (e.g., The next step of the strategy is E, I have to check the structure of my text. I will check that my text is structured and has an introduction, development and conclusion). Whereas in the reader-focused instruction, students saw how different readers reacted and evaluated imperfect texts, providing possible solutions to the problems they noticed (e.g., This paragraph is confusing, there is a lot of information here. If I were her, I would split it into two different paragraphs with clear

information in each). Despite this difference, both conditions had the same set of evaluation criteria. The modelling was performed similarly in the two experimental conditions, as described above, because the implementation conditions (e.g., avoid taking notes, dramatisation) are related to the instructional technique, rather than the content or approach.

Finally, the last common intermediate learning objective included in the sequence in both learning conditions was the interiorisation of the knowledge acquired during the interventions. To achieve this intermediate learning objective, the instruction was based on a design principle of giving students opportunities to apply their new knowledge to meaningful tasks with real communicative goals and a real audience. Based on Ausubel's theory (1968), students had to apply their new knowledge to specific tasks and relate it to previous knowledge, fostering integration of the new knowledge. In both instructional programs this was operationalised through a set of learning and instructional activities in which students revised their own texts collaboratively or a researcher-provided text individually, applying the knowledge acquired, and writing a final text. Students were also able to compare their final output, from the individual task to the output of an expert as a means of encouraging them to use their acquired knowledge (See Table 2, ILO 4, DP 4, LA 4.1, 4.2 and 4.3 and IA 4.1, 4.2 and 4.3).

Implementation of the Instructional Programs

Both instructional programs were implemented by the first author, who has previous educational experience in the implementation of this kind of program, over four consecutive weeks (one session per week). Table 5 is an overview showing the order of implementation of the intermediate learning objectives, design principles and learning and instructional activities (combined and summarised in the table for ease of reading). Both instructional programs shared most intermediate learning objectives (ILO 1, 2 and 4) and only differed in the third intermediate learning objective. In the writer-focused instruction students were explicitly instructed in, and observed the model application of the PIENSO revision strategy (ILO 3A and 3B), while in the reader-focused instruction students observed a model trying to understand a text and suggesting possible improvements to it (ILO 3).

All sessions were similar, sharing some intermediate learning objectives with others being different according to the differences between the two instructional programs. The final session was the same for the two programs. As Table 5 shows, even for the specific-condition intermediate learning objectives the instructional design was similar, so the differences were almost exclusively related to the content.

In both instructional programs the instructional design mainly involved observational learning plus collaborative practice in pairs in which students revised a text and wrote a final version. Each student in the pair had the role of writer or helper. The roles were swapped between the second and third sessions. The writer was in charge of carrying out the task by verbalising all his or her actions (as similar as possible to the model). This collaborative task lasted around 15-20 minutes.

Table 5 also includes information about the instructional materials used to support the learning and instructional activities in both instructional programs. In all sessions, support material was provided for the instructor (e.g., a modelling script) as well as for students (e.g., a PIENSO strategy worksheet). For the common aspects in both interventions the materials were exactly the same. For the specific content in the interventions, similar material was provided to the students which varied slightly depending on the content in each program (e.g., a notes sheet).

Table 5

Overview of the implementation sequences for the instructional programs

	Intermediate Learning Objectives		Design principles		Learning and Instructional sequence activities[1]	
Session	**Writer-focused**	**Reader-focused**	**Writer-focused**	**Reader-focused**	**Writer-focused**	**Reader-focused**
1	1 and 2		1 and 2		1. Activation of prior knowledge (*Metacognitive revision student matrix in Appendix A)* 1.2 Integrate new knowledge into existing knowledge 2.1 Presentation communicative goal setting strategy (*Communicative goals student worksheet in Appendix B)* 2.2 Reflection about different goals (*Communicative goals student worksheet with a real example in Appendix C)* 2.3 Application of the strategy	
	3A and 3B	3	3A and 3B	3	3A.1 Presentation revision strategy (*Revision strategy student worksheet in Appendix D*) 3A.2 Student memorisation of the strategy 3B.1 Observation of a writer applying the strategy (*Model script instructor worksheet in Appendix E & Take notes student worksheet in Appendix F)* 3B.2 Reflection about model actions and thoughts	3.1 Activation and reflection on prior knowledge 3.2 Observation of a model acting as a reader – (*Model script instructor worksheet in Appendix G & Take notes student worksheet in Appendix H*) 3.3 Reflection about model actions and thoughts
2/3	3B	3	3B	3	3B.1 Observation of a writer applying the strategy *(Model script instructor worksheet & Take notes student worksheet)* 3B.2 Reflection about model actions and thoughts	3.2 Observation of a model acting as a reader (*Model script instructor worksheet & Take notes student worksheet)* 3.3 Reflection about model actions and thoughts
	4		4		4.1 Revise a previously written text and write a final version collaboratively (*Previous student text and goal setting worksheet & Final student worksheet in Appendix I)*	
4	4		4		4.2 Revision of a researcher-created text and writing a final version individually (*Researcher created text (Appendix J) and goal setting & final student worksheet)* 4.3 Analysis of high-quality texts (Student model text in *Appendix K*)	

Discussion

In this section, we discuss the implications of using the proposed reporting system for the analysis of interventions. We will first discuss the validity of our study's interventions according to the content and instructional dimensions. Then we will examine some possible explanations for the similar results from the two experimental conditions and some aspects to consider in future studies. We will provide three recommendations for using the reporting system based on our experience in reporting interventions and discuss the educational implications of using the proposed reporting system.

Improvement of the Validity of the Independent Variable

The contrast between the interventions being examined allowed us to test whether both conditions were indeed valid representations of the intended approaches; a writer-focused instruction or a reader-focused instruction. Based on the theories underlying strategy-focused instruction we included two specific intermediate learning objectives in our writer-focused condition: (1) procedural knowledge about how to revise texts, and (2) self-regulated control in the use of a revision strategy. The knowledge and skills in this kind of instruction are typically imparted to students via various components such as direct teaching, modelling and collaborative or individual practice (Fidalgo & Torrance, 2018; Harris & Graham, 2018). These were exactly the components that we considered in the writer-focused condition. The intermediate learning objectives and instructional design used are in line with the most effective approaches to teaching students to regulate their own behaviour (Graham 2006b; Graham & Harris, 2018a; Graham & Harris, 2018b in this special issue; Harris & Graham 2018). Therefore, the writer-focused instruction condition seems to be a valid representation of the intended approach.

The reader-focused condition was rooted in the communicative paradigm of writing, in which students should be aware of the aim of their communication and their audience, and should be able to gauge their needs. This knowledge can be taught through learners observing readers reading texts aloud (Crasnich & Lumbelli, 2005; Couzijn & Rijlaarsdam, 2005; Lumbelli, Paoletti, & Frausin, 1999) or learners moving from their writer's role into the reader's role (Couzijn, 1999; Couzijn & Rijlaarsdam, 2005, Holliway & McCutchen, 2004). In our reader-focused instruction students observed how

readers responded when reading and evaluating imperfect texts, including suggestions about how to correct the problems they saw. However, an in-depth analysis following the proposed reporting system raised certain concerns about the validity of the condition as we designed it. It became evident that the model scripts and subsequent reflection phase after observation emphasised not only how readers responded to texts, but also the reader's evaluation of the text and their specific suggestions to improve it. So the model in this condition was not just a reader trying to understand a text, but also a reviewer who evaluated the text and provided alternative solutions to problems they noticed. In other words, what students observed was a reflective reader, the reader as reviewer, as an evaluator who also suggested improvements rather than a communicative reader trying to understand. Normally, studies following the reader-focused approach only give students information about how readers respond to imperfect texts (for a review see Rijlaarsdam et al., 2008), without providing evaluation of the text based on specific evaluative criteria and feedback on how problems might be solved. It is therefore possible that the students in this condition acquired more revision knowledge than they would have had, had the intervention been validly based on the literature about observing readers.

From the discussions we had between subsequent versions of the analysis it became clear that the designing author deliberately included this so-called reflective reader, aiming to create two interventions as similar as possible by providing learners with the same set of text evaluation criteria, related to the goal setting process. Obviously, striving to keep the content as similar as possible in the two conditions led to the loss of one of the intended key differences between the interventions. The whole process of analysing the already tested interventions taught us that we must embed the second intervention in a different theoretical framework from the one we started with. It is not the case that the two comparisons between the two conditions are no longer valid after the analysis, but rather that the construct validity of one of the conditions was low: we compared different constructs than we first intended. We assume that this might not be an uncommon experience: it is part of many publication practices that intervention labels or descriptions change along the way, in response to critical questions from reviewers.

Yet it would be preferable for theoretical and practical reasons, to create an intervention report as we reported here along similar lines before the actual implementation, and to organize a trial phase where experts can question the

interventions, their operationalisation and their theoretical embedding. Trialling interventions before actual data collection would be similar to pretesting measuring instruments. Such a validation check, signed off by experts, might be part of the publication requirements of high standard journals in the near future.

Also, the use of the proposed reporting system would allow to better understand the results of an intervention and help authors to detect possible weaknesses which can be improve in future interventions studies (Grabowski, Mathiebe, Hachmeister, Becker-Mrotzek, 2018 in this special issue). In the present study, the lack of results could be explained by the common elements of the contrasting design variable. A common key element in the modelling phase was the text evaluation criteria that were learnt in another stage (communicative goal setting) and now applied by the models to detect inconsistencies, mistakes and so on, while thinking aloud as a reviser or as a reflective reader. It seems, therefore, that the use of these criteria is key, and not the reviewer-model demonstrating the process of making changes. This might imply that part of the intended contrasting intermediate learning objective 'knowledge and application of the revision process' (see Table 3, DP 3A) did not happen. As long as we do not know the extent to which the intermediate objectives were achieved, we cannot say more about the contrasts. It would be important, therefore, to include the evaluation of the intervention's intended intermediate learning objectives in the measurement design.

Finally, now that we know that both conditions were effective, that they were valid in terms of content, but that one of the conditions was not a representation of the intended construct, we must consider new contrasts. Considering the role of the three components in the CDO-strategy, it might be important, given our results, to test whether the addition of the revision-implementation phase as part of the revision process (Operating) has added value over and above comparing, and diagnosing errors. Another contrast, one that we had initially intended to address in this study, is to steer the revision process from a writer to a reader perspective. The modelling in the reader-focused instruction condition should focus on how readers react to imperfect texts, without including more information about evaluative criteria or how to solve problems: this condition should align with the text's communicative function, demonstrating a reader trying to understand the message in the text (Rijlaarsdam, Couzijn, Janssen, Braaksma & Kieft, 2006). In such a condition, the model should represent the intended reader.

Recommendations

We would like to propose the following recommendations:

1. We recommend that JOWR require detailed descriptions and validity checks of the independent variable. Only after an in-depth analysis of our instructional programs in several rounds of critical readings and careful analyses following the proposed reporting system did the concerns about the validity of one of our instructional programs become evident to us, even when high-fidelity measures where considered in the study under analysis (e.g., lesson audio recordings, portfolios, model scripts). Therefore, mandatory use of such a detailed reporting system in instructional research may make it clear what was really taught and how it was taught in each condition in a comparative way (for a guideline on how to report similarities and differences between interventions see De Smedt & Van Keer, 2018 in this special issue), something that sometimes remains unclear or hidden under labels and commonly-used terms in descriptions of the independent variable. At the same time, using the proposed reporting system would encourage replication of research which is critical to ensure contributions to the developmental and instructional theories of writing.
2. We recommend including intermediate learning objectives in the measurement design. This would make it possible to test the extent to which the students achieved the specific intermediate learning objectives during instruction, as well as to test whether the instructional design was effective in the achievement of those objectives. It would make it possible to analyse how far intermediate objectives contribute to final objectives.
3. We recommend that researchers and instructional designers start to apply the descriptive system not only as a reporting tool, but also as a validity check during the design process. In addition to being useful for reporting interventions in scientific publications, such a system may also help in the design of the interventions themselves. Designing interventions is an extremely complex task, entailing juggling many constraints. This system could help researchers and instructional designers to clearly define the rationale for the selection of intermediate learning objectives and the instructional design for the achievement of those objectives. This analysis in the design phase could provide information about gaps, undefined actions, lack of rationales in some of the choices, etc. We would

expect that the use of this reporting system as an instructional design matrix would stimulate deeper thinking and therefore improve the quality of instructional design. It would be preferable to validate the design via an expert panel before the design is operationalised in practice as a research tool.

Educational Implications

Reporting interventions in detail has educational and practical consequences in addition to theoretical implications. Some studies have focused on analysing the inclusion of evidence-based practices in schools in various countries (e.g., Dockrell, Marshall, & Wyse, 2015 in the UK, De Smedt, Van Keer, & Merchie, 2016 in Belgium; Graham, Capizzi, Harris, Hebert, & Morphy, 2014 in the USA; Rietdijk, Janssen, Van Weijen, Van den Bergh, & Rijlaarsdam, 2017 in the Netherlands). A common finding of these studies is that despite teachers indicating that they use a majority of evidence-based practices in teaching writing in their classrooms, the frequency of use was low in all contexts and educational levels examined. This is an issue if we consider the negative findings in various educational reports across many countries where student's writing performance seems not to meet required standards at varying educational levels (e.g., Department of Education, 2012 in the UK; Kühlemeier, Van Til, Feenstra, & Hemker, 2013 in the Netherlands; Ministerio de Educación, 2010 in Spain).

From our point of view, teachers are the key to reducing the gap between research and practice. Of course, providing more details about interventions in empirical papers will not, on its own, have a direct effect on whether teachers use the intervention. However, detailed analyses of the instruction as described in the reporting system would increase pedagogical knowledge on how to teach writing (Koster & Bouwer, 2018 in this special issue; Koster, Bouwer & Van den Bergh, 2017). The availability of such knowledge in teacher education and professional development programs may contribute to the implementation of empirically based writing education, and therefore the improvement of student writing skills and encourage knowledge transfer from scientific to educational fields.

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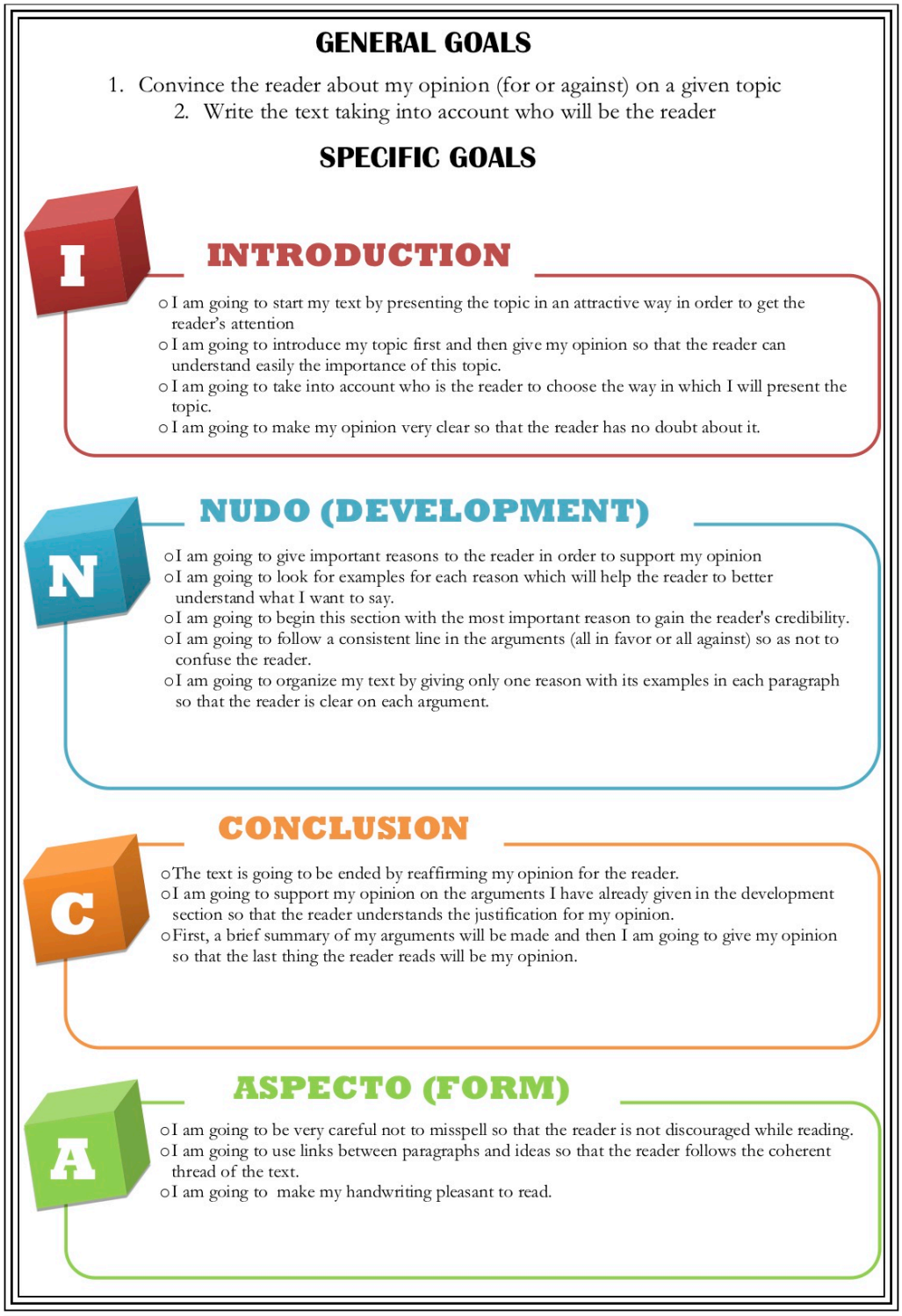
Appendix A. Metacognitive revision student matrix

AFTER WRITING YOU ALWAYS MUST:

REVISE

WHAT IS REVISION?	HOW TO REVISE?	WHEN AND WHY TO REVISE?
REVISION is an essential and necessary sub-process to write a good text.	In your draft you have to: - Detect errors or deficiencies at the grammar structure and organization level. - Diagnose content or rhetorical problems. - Correct or modify the aspects that can be improved (add/delete/substitute/reorganize).	You ALWAYS have to REVISE it after the first draft is done. It is essential and it also will determine the quality of the final text. It helps you to detect many things which can be improved, things that are not well understood, whether or not you have achieved your goals, etc.

Appendix B. Communicative goals student worksheet



GENERAL GOALS

1. Convince the reader about my opinion (for or against) on a given topic
2. Write the text taking into account who will be the reader

SPECIFIC GOALS

I — INTRODUCTION

- I am going to start my text by presenting the topic in an attractive way in order to get the reader's attention
- I am going to introduce my topic first and then give my opinion so that the reader can understand easily the importance of this topic.
- I am going to take into account who is the reader to choose the way in which I will present the topic.
- I am going to make my opinion very clear so that the reader has no doubt about it.

N — NUDO (DEVELOPMENT)

- I am going to give important reasons to the reader in order to support my opinion
- I am going to look for examples for each reason which will help the reader to better understand what I want to say.
- I am going to begin this section with the most important reason to gain the reader's credibility.
- I am going to follow a consistent line in the arguments (all in favor or all against) so as not to confuse the reader.
- I am going to organize my text by giving only one reason with its examples in each paragraph so that the reader is clear on each argument.

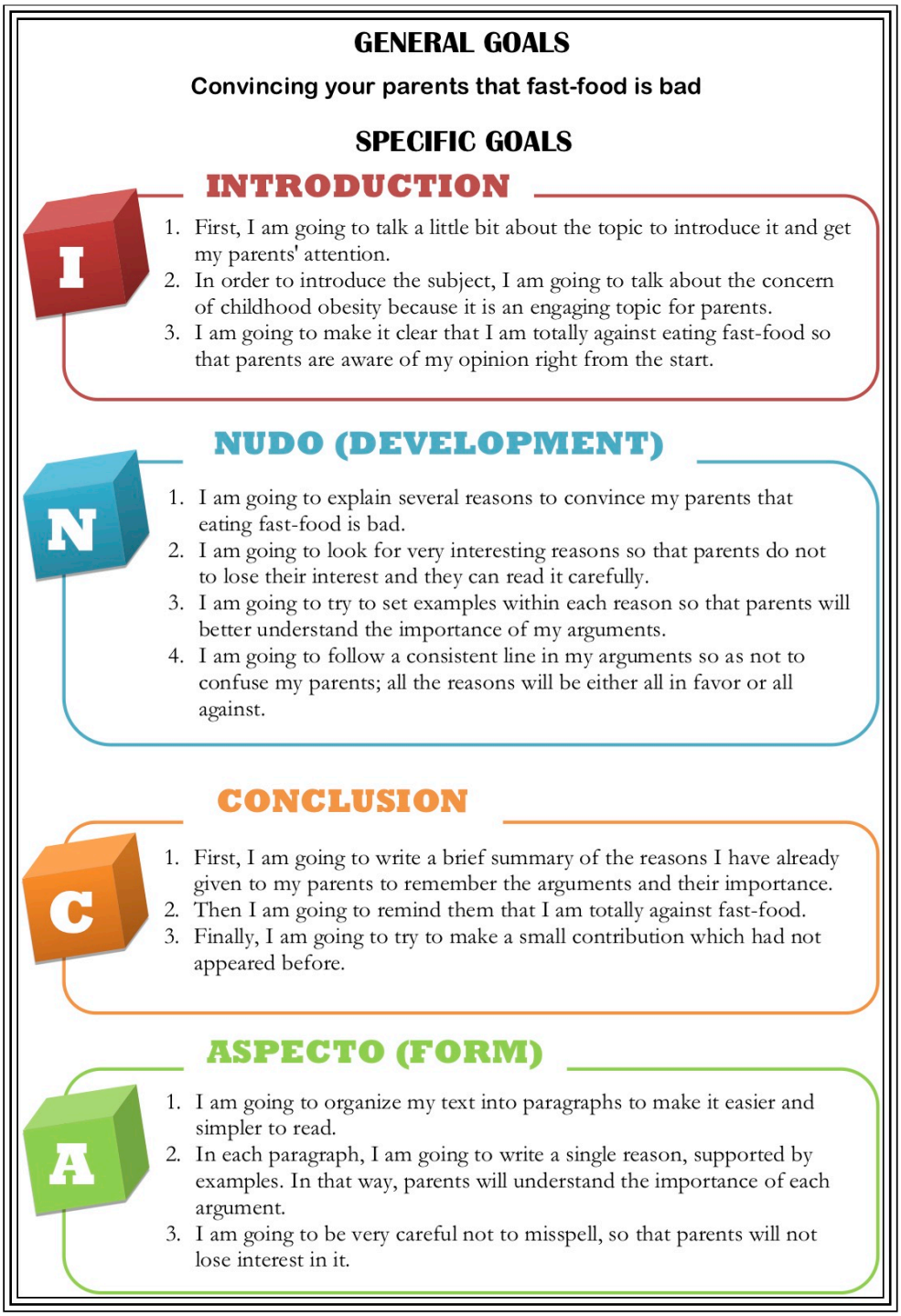
C — CONCLUSION

- The text is going to be ended by reaffirming my opinion for the reader.
- I am going to support my opinion on the arguments I have already given in the development section so that the reader understands the justification for my opinion.
- First, a brief summary of my arguments will be made and then I am going to give my opinion so that the last thing the reader reads will be my opinion.

A — ASPECTO (FORM)

- I am going to be very careful not to misspell so that the reader is not discouraged while reading.
- I am going to use links between paragraphs and ideas so that the reader follows the coherent thread of the text.
- I am going to make my handwriting pleasant to read.

Appendix C. Communicative goals student worksheet with a real example



GENERAL GOALS

Convincing your parents that fast-food is bad

SPECIFIC GOALS

INTRODUCTION

I

1. First, I am going to talk a little bit about the topic to introduce it and get my parents' attention.
2. In order to introduce the subject, I am going to talk about the concern of childhood obesity because it is an engaging topic for parents.
3. I am going to make it clear that I am totally against eating fast-food so that parents are aware of my opinion right from the start.

NUDO (DEVELOPMENT)

N

1. I am going to explain several reasons to convince my parents that eating fast-food is bad.
2. I am going to look for very interesting reasons so that parents do not to lose their interest and they can read it carefully.
3. I am going to try to set examples within each reason so that parents will better understand the importance of my arguments.
4. I am going to follow a consistent line in my arguments so as not to confuse my parents; all the reasons will be either all in favor or all against.

CONCLUSION

C

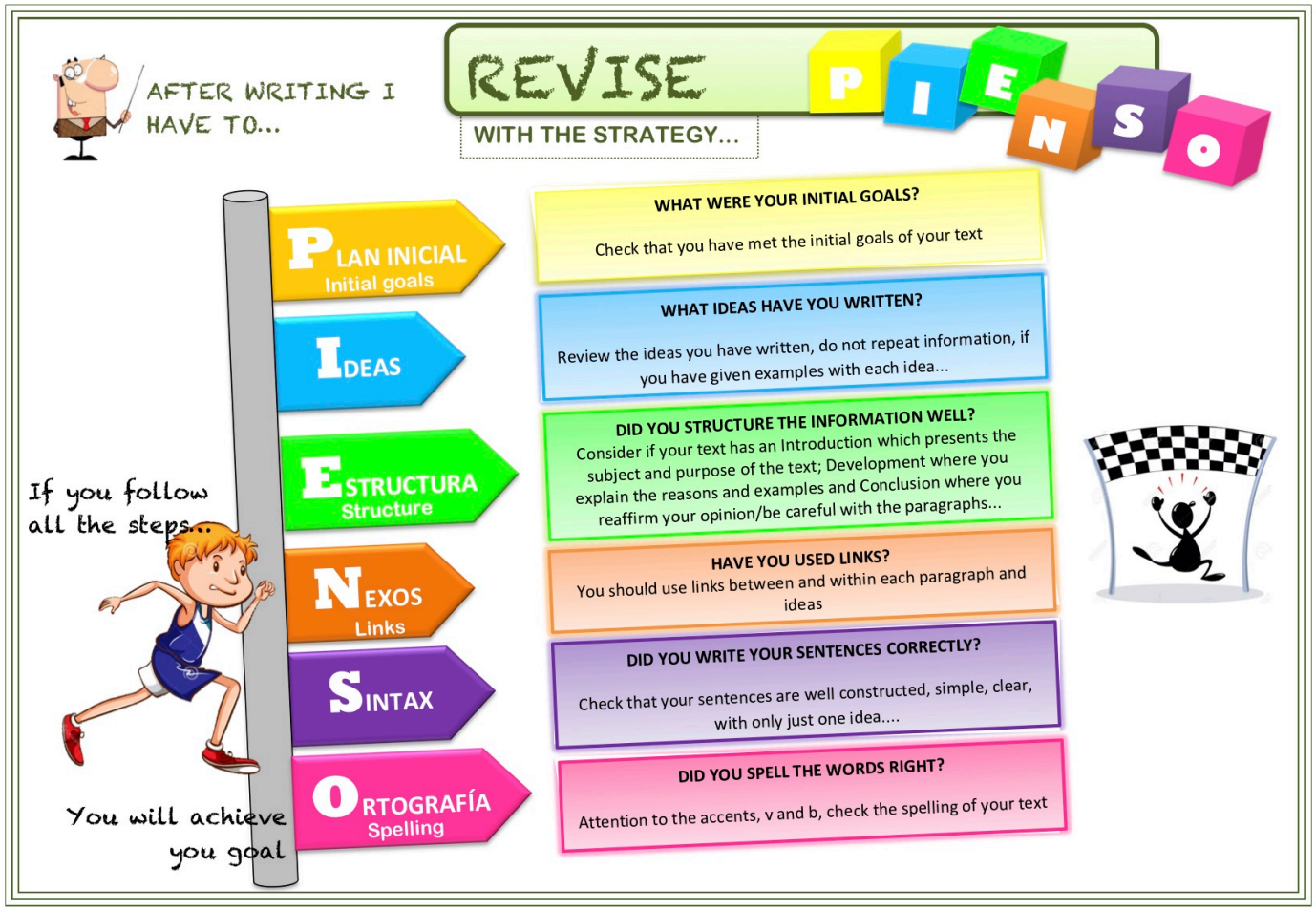
1. First, I am going to write a brief summary of the reasons I have already given to my parents to remember the arguments and their importance.
2. Then I am going to remind them that I am totally against fast-food.
3. Finally, I am going to try to make a small contribution which had not appeared before.

ASPECTO (FORM)

A

1. I am going to organize my text into paragraphs to make it easier and simpler to read.
2. In each paragraph, I am going to write a single reason, supported by examples. In that way, parents will understand the importance of each argument.
3. I am going to be very careful not to misspell, so that parents will not lose interest in it.

Appendix D. Revision strategy student worksheet



Appendix E. Model script for the instructor

WRITER-FOCUSED INSTRUCTION MODELLING

Well, I just finished the first draft of my text after planning it. Now it is time to one of the most important actions, revise it! If I do it well, I will get a perfect text! I will pay a lot of attention and try to use the revision strategy my teacher taught me some years ago. Let's see…the revision strategy was…was…oh yes! PIENSO (in English "I think"), just what I should do to revise my text! I will read my text and implement each of the steps of the strategy. Then I could write the final text!

The first letter was...P about "Planes iniciales" (in English initial goals). Of course, the first think I should do is to revise if I have achieved my initial goals. I used the strategy INCA to set my goals. I will read my goals again and try to check if I have achieved them during the reading. Let's continue!

The next step is the I, so I should revise the ideas of my text. I will read what I have written. I should consider if the ideas are attractive for my parents as I set on my goals. Also, I need to avoid repeat information. In the introduction, I have written about childhood obesity and its main cause, which is fast-food. I think this idea is a good one to introduce the topic! I really like it and I think it is interesting. I think it will catch up my parents' attention. Let's see the ideas of the development. First, I wrote that fast-food is bad because it is unhealthy. Well…I think I need more information to explain it and make the reason clear. I need to convince my parents! So, definitely I am going to add more information. Oh yes! I can add what we learnt in science last week, oh…I hate science! Hey, I should focus on the text! Come on! What I was thinking about…? Oh yes, I should add information. I can write that fast-food is dangerous because eating too much fast-food can raise your cholesterol and it make cause a lot of illnesses. Yeah! Now it looks like a great reason! I am going to write it. But there is something missing…oh yes! I need to add some example! It was on my initial goals. I can add some of the illnesses as heart attacks or lung diseases. I am going to write it and this reason will be perfect! [Write the examples and repeat the information aloud]. I will read the next idea [Read the idea "This kind of food is addictive because of the amount of sugars it conttains"]. I think this idea is good! Fast-food is addictive! Also I have added some examples, so my reason is clear! I will go on with the revision! It is worth the effort. I will read the last reason [Read the reason "Moreover, the poor quality of the products and the amount of sugars that it contains make fast-food very unhealthy."]. Ups, I have repeated information! It is the same reason as the introduction and the first two reasons. Definitely, I should think another different idea. [Take a few second to think]. I cannot find more reasons, I do not have more ideas. Well, given that I do not have more ideas, I am going to write just two. It is better to have two good reasons than have three and one wrong. I'm going to cross this reason out. [Cross out the reason]. Finally, let's see the ideas of the conclusion. [Read the conclusion "In conclusion, fast-food is bad because it is dangerous

for the health, moreover it is addictive and has a low quality. For all these reasons, I am against fast-food and I think it should be banned at least for children."]. I think it is good! I think the ideas of my text are really good! Also because they are interested also for my parents, who will read the text! Without any doubt, the changes I have introduced have improved a lot the quality of the text. Go on with the next step!

Now I should revise the E which means Estructura (in English "structure"). First, I am going to check the general structure of my text. That is, my text should have an attractive introduction in which I should present the topic. I am going to check it. [Reads through and alludes to each part of the introduction as he reads it aloud]. Well done! The introduction is perfect! Now let's see the development, in which I should talk about my reasons and add some examples to clarify them. [Read trough the development]. Great! I have done it! Also, I have written each reason in a single paragraph. And finally, I have a conclusion. Well, the structure of my text is good!

Come on, I am very motivated with this! The next step is the N, so I should revise the Nudo (in English "development"). Oh no, I am wrong! The meaning of N is Nexos (in English "links"). I should check if I have used links between ideas and paragraphs. I should be careful with the links, I always forget use them! First, I am going to check if I have written links between paragraphs. Ups, I only have written one in the conclusion. I am going to add a link at the end of each reason. In the first reason, I am going to write…for example…"First of all". Yes! It definitely looks better! For the second reason I will follow with "To continue". Mmm, I do not like so much. Let's think another one…Maybe "second". Yes, it is better! [Write the link]. I already have a link for the conclusion, so that's all! Now, I will check the links between ideas. [Read over the text]. Ups, I have repeated two times the link "for example", I need to change one of them. For the second reason, I am going to write "in instance" instead of "for example". Same meaning but different words! Good! I should avoid being boring.

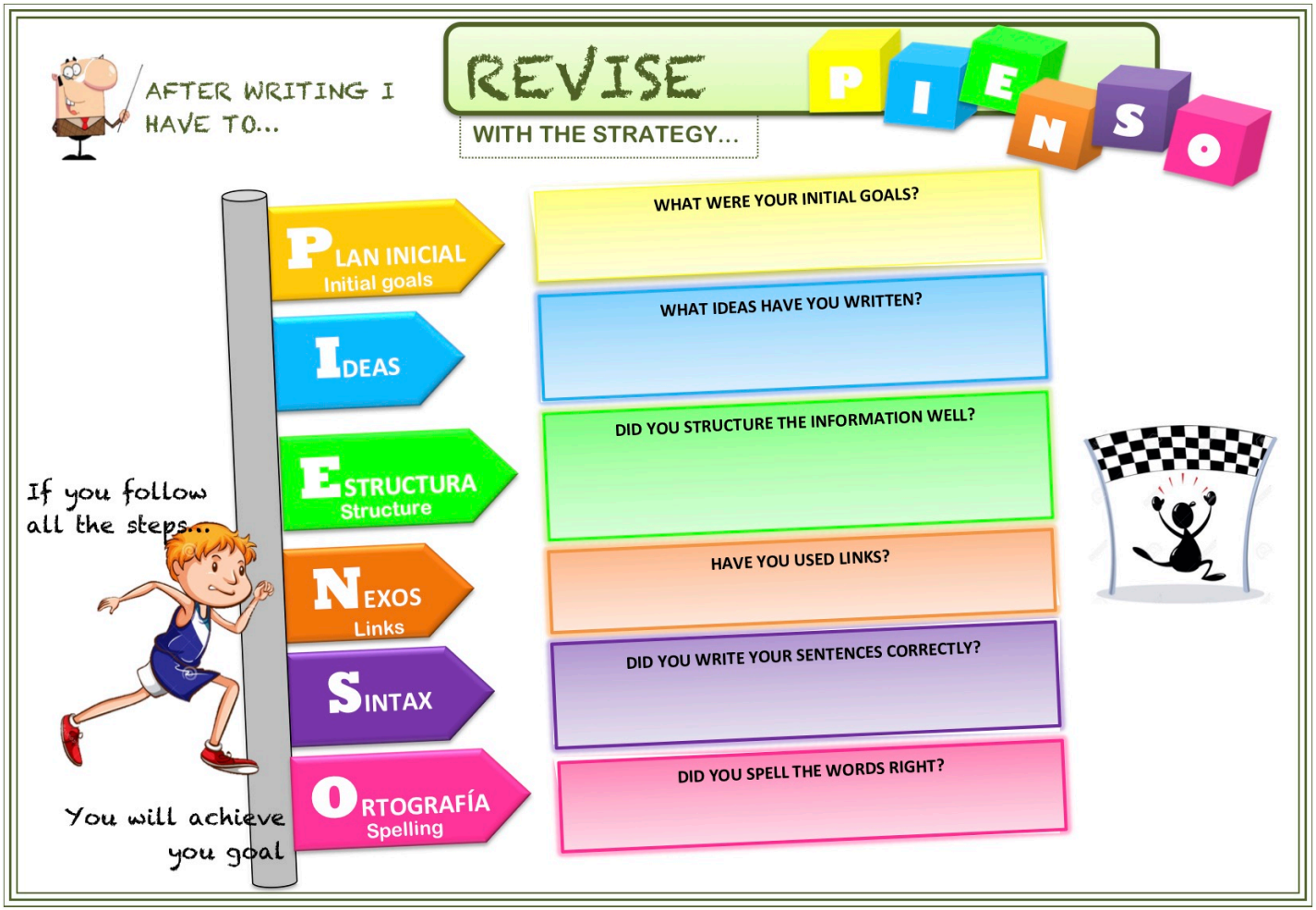
Come on! I have just two steps left. The next step is the S, which is related with the Syntax. I should try to make clear and well-structured sentences. It was also in my initial goals! [Read and analyze the sentences until you reach the long sentence of the second reason]. Uff, this is a too long sentence!! It is very difficult to understand it. I should split it up in two sentences at least. One sentence would be "in instance, it is addictive and that's why people can't stop eating fast-food" so I need to add a dot here. [Write the dot]. Now, I should add a comma. [Add a comma before McDonald's]. I am going to read it again. [Read the sentence]. Yes, now it is ok! Well, let's continue with the other sentences. [Check the sentences aloud].

Oh yes!! There is just one step more! I should revise the O, in which I should be careful and check the Ortografía (in English "Spelling"). I am going to check it to be sure that my text does not contain any spelling mistake! [Read the text carefully]. Ups, what a mistake! I have written contains with two t! Luckily,

I am revising the text! [Correct the mistake and continue reading]. Oh no! It is not possible! Another mistake! I have written dangerous with two g! What a disaster! I am going to change it now! [Correct the mistake and finish reading the text].

Puff.... luckily I have revised my first draft of the text and made the necessary changes. There were some things completely wrong! Now the text looks almost perfect. Also I have achieved my initial goals! I am very proud!!

Appendix F. Take notes student worksheet



Appendix G. Model script for the instructor

READER-FOCUSED INSTRUCTION MODELLING

Well, I'm going to read this text that Juan, a 6th grader who usually writes me things, has given to me. He told me that he was sure it would be interesting to me...I'm intrigued! Oh, it's an argumentative text about fast-food, that's a really interesting topic. The main goal of an argumentative text is to convince the reader of your opinion on a topic. So I hope Juan has made his opinion clear to convince me!

Let's see, I'm going to start reading [read the whole introduction quickly first]. Good! He has written such a good introduction, that's important! Moreover, if the introduction is attractive, I will read it more keenly. I'm going to focus a little more on the introduction.

[Read the first sentence: "Nowadays there is great concern about the diet of the youngest children due to the high rates of childhood obesity in the Spanish society."]. Undoubtedly it was a great way to start his text! He has captured my attention. I have a little brother and I'm worried about this. This is an important issue, especially for children. I will continue reading the text that seems very interesting!

[Read the second sentence: "One of the main issues is the increase in the consumption of so-called "fast-food". The name reflects its poor quality and negative effects on people's health."]. Really interesting, a good way to introduce the topic is to introduce briefly what is fast-food. I like it! But...he has not said whether he is for or against fast-food yet. That is a critical point in the argumentative texts' introduction. Oh, wait! There is another sentence.

[Read the last sentence in the introduction: "I am completely against fast-food and now I will explain some of the reasons which support my opinion."]. Well done, here is the writer's opinion! The topic is not easy. I agree that fast-food is unhealthy…but I love pizza, hotdogs…I need good reasons to be convinced by his opinion. For the moment, I really like the introduction. Clear and well organized, with all the necessary points! I don't think I found any spelling mistake, that's good! It is very pleasant! I'm really looking forward to reading the whole text. Let's see!

Well, I am going to read the first reason. [Read: "Fast-food is unhealthy"]. Uhm… and that's all? I am not sure about this reason. I think it could be better if he explained why he said that. Maybe he forgot to write it. I'm gonna write him a note to noticed it to him that here there is a mistake. [Write: "I do not understand why fast-food is dangerous; you should explain it in more detail. Also it would be good if you added an example. The argument would be clearer"].

Maybe the second reason is better… [Read: "This kind of food is addictive because of the amount of sugars it conttains."]. He has written contains with two t! It is annoying! I'm going to surround it with red so he can be aware this terrible mistake. I have lost my focus a little with this spelling mistake. I will continue reading [Read: "This kind of food is addictive because of the amount of sugars it contains."]. This reason is better than the previous one. [Read: "For example, despite the negative reports about this type of food, people can't stop eating it and that's why hamburger or pizza chains like McDonald's Burger King or Telepizza have been and continue to be very successful, especially among young people."]. Puff…it is a really long sentence. I need to read it again to understand the meaning [Read the sentence again]. The sentence has four lines and no commas nor dots. It would be better if he tried to write his ideas in short sentences. The information is interesting, but it is really difficult to understand the main idea as he wrote it. I am going to write him a note here [Write: "The sentence is too long, I don't quite understand what you mean").

Well, let's see what happens with the last reason. The introduction was really good, but until now the development…it is not good at all. I am getting a little bored. Come on, there is not much left. [Read: "Moreover, the poor quality of the products and the amount of sugars that it contains make fast-food very unhealthy."]. But…it is really another reason? He repeats the information from the previous one. Moreover, he did not explain the reason nor add any example! Your reasons have definitely not convinced me of anything. [Write: "You are repeating information. Also you need to explain your reasons. It is more important have good reasons than write a lot of bad reasons."]. I am disappointed with this development. He has not managed to convince me that fast-food is bad. The reasons are not good enough and also he did not explain it clearly. The text lacks information.

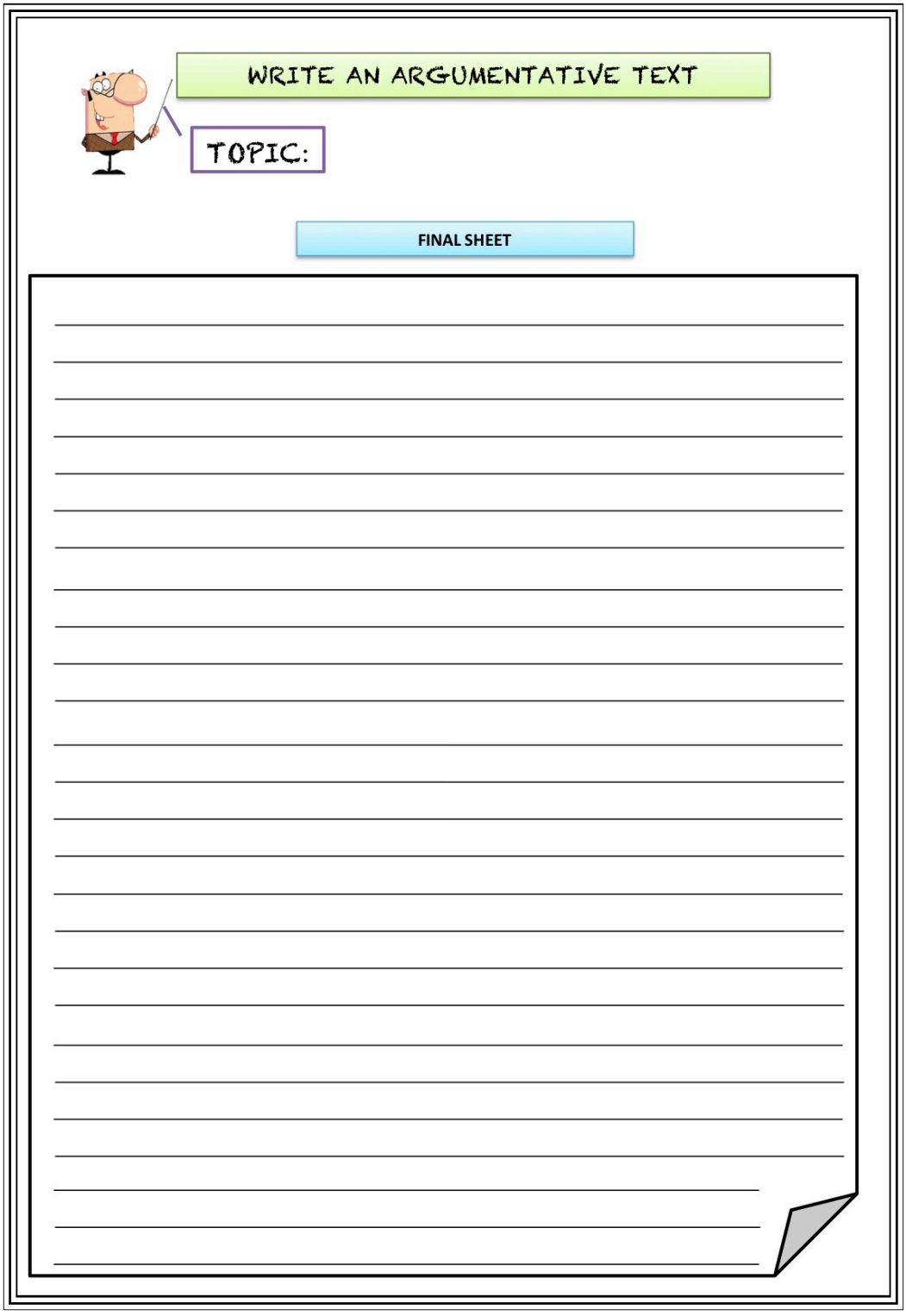
Puff, I do not want to read any more, but I am just going to finish it. [Rad: "In conclusion, fast-food is bad because it is danggerous"]. Oh no! Another spelling issue! I am sure that he did not revise the text. I'm going to surround it in red. [Read: "In conclusion, fast-food is bad because it is dangerous for the health, moreover it is addictive and has a low quality. For all these reasons, I am against fast-food and I think it should be banned at least for children."]. Well, he introduces the conclusion with a link. That is good because I know that he is finishing the text! Maybe, it would be better if he used more links throughout the text. I am going to write a note in the development [Write: "you should use more links between ideas and paragraphs"]. Also, he has summarized his reasons, but…I miss more information in the development! The conclusion is not too bad, it is more or less clear! Anyway, he should be careful with spelling. I think he could improve a lot his text if he revised it and consider my notes!!

Appendix H. Take notes student worksheet

WRITE THOSE ASPECTS THAT THE READER HAS POINTED OUT WHEN READING THE TEXT

POSITIVE COMMENTS	NEGATIVE COMMENTS

Appendix I. Final student worksheet



Appendix J. Research-created student text

Argumentative text: A year abroad

DRAFT SHEET

I am completely in favour of children who do it, although it can also have negative effects.

First, moving away for a year will make it easier for you to learn or improve another language, which is usually English. This has many advantages, for example it will make you get better grades in English when you return to Spain. Also, for example, when you are older, it will be probably easier for you to find a job.

Third, if you go abroad for a year it will be also good because you will meet people from many parts of the world, learn about their cultures and languages.

If you mobe to another country one year, you'll learn to take responsibility for the things you have to do, and it will increase your autonomy, for example, you will have to be responsible for doing your homework on your own, as your parents won't stand over you reminding it all the time.

To sum up, I am all in favour of spending a year away from your country for all the reasons I have given above and many more. I sincerely believe that going abroad is a great experience and I would certainly go, wouldn't you?

Appendix K. Student model text

Argumentative text: Living a year abroad

FINAL SHEET

Nowadays, a lot of importance is given to travelling and living experiences from an early age. For this reason, in recent years the number of children who decide to spend a year of their lives studying abroad has increased greatly. I am completely in favour of children going abroad for a year and now I will explain some of the most important reasons which support my opinion.

First, moving away for a year will make it easier for you to learn or improve another language which is usually English. This has many advantages, for example it will make you get better grades in English when you return to Spain. Another good example is that when you are older it will probably be easier for you to find a job.

Second, going away for a year will make it easier for you to meet people from all over the world, as well as their culture. This is great, because for example, you will realize that things that we don't value here and that are forbidden in other countries (like dress as you like).

Thirdly, if you go to live in another country for a year you will learn to take responsibility for the things you have to do, and that will increase your autonomy. In fact, you'll have to do your homework and things on your own, since your parents won't stand over you to remind you about it.

In conclusion, I am completely in favour of spending a year away from your country for all the reasons I have given above and many more. I sincerely believe that going abroad is a great experience and I would certainly go, and you, are you going to miss it?

7 Conclusions

The research presented in this dissertation is framed within two research lines of interest and analysis. The first research line focuses on the analysis of upper-primary students' writing process in a comprehensive way through the use of online measures. The second and main line of research of the dissertation, focuses on the analysis of the effectiveness of strategy instruction from a componential point of view, exploring the effects of different contents and instructional components on the improvement of upper-primary students' written competence. These lines of research have been operationalized through the design and implementation of four studies that constitute the main body of this dissertation, which have been presented throughout the previous chapters (chapters three to six). Although the results and conclusions of each study have been specified and discussed in each chapter, the overall conclusions of the dissertation go beyond these.

Therefore, the main aim of this chapter is to provide a general picture of the conclusions derived from the research contained in the doctoral dissertation as a whole. Moreover, the contributions of these conclusions at both scientific and educational levels, the research limitations and gaps detected and future lines of research will be presented.

In order to facilitate the reading and organization of the chapter, the general conclusions will be presented according to the two aforementioned research lines, that is, the evaluation of upper-primary students writing process through the use of online measures and the componential analysis of strategy instruction. Moreover, and in accordance with the internal regulations for dissertations presented with the international mention, such as the present one, the chapter will be presented first in English and then a replica in Spanish.

Assessment of Upper-primary Students Writing Process through the Use of Online Measures

The first research line of the dissertation focused on evaluating in a comprehensive way the writing process of upper-primary students (5^{th} and 6^{th}) through the use of online measures. To this end, it will be analyzed not only how much time students devote to the different writing processes or how they distribute them during composition, but also the relationship between both aspects and text quality. This aim arises from the need to know in-depth what the writing process of upper-primary students

is. This serves as a starting point for the design and implementation of effective writing interventions to improve students' writing competence according to students' needs, the second and main research line of the dissertation. Based on the review of the scientific literature, it was possible to verify the scarcity of empirical studies focused on analyzing the process or writing skills of students in the last years of primary school (Koutsoftas & Gray, 2013; Limpo, Alves, & Fidalgo, 2014; Whitaker, Berninger, Johnston, & Swanson, 1994). At the same time, a review of these studies revealed the existence of certain research gaps mainly related to the methodology implemented. Thus, the analysis of the students' writing process was carried out mostly through offline measures, taken either from linear writing tasks in which the students were required to plan, write and revise during a certain period of time, or from specific tasks designed ad hoc to evaluate a specific writing process (Limpo et al., 2014; Whitaker et al., 1994). Therefore, none of these studies actually evaluated the students' writing process but their ability to use the main processes such as planning, writing and revision. These research gaps justify and contextualize the relevance of the first research line of study of the present dissertation. In this context, the first study of this dissertation was designed to overcome this limitation and thus provide detailed information on the writing process of students in the last years of Primary Education and its relationship to textual quality. On the basis of the results obtained, it is possible to draw the following **general conclusions**.

1º.- In the last years of Primary Education, students devote most of their composition time to write their ideas, making little use of crucial processes for writing high-quality argumentative texts such as planning and revision. Likewise, a detailed analysis of the different sub-processes related to planning and revision revealed that these students devote most of their planning time to content generation, without generally setting goals or organizating subprocesses. On the other hand, the main revision subprocess was reading, with students rarely applying evaluation or editing processes at a mechanical or substantive level. This information is especially relevant since it complements the results obtained in previous research. First, according to the developmental theories of writing, low level processes are more automatic in upper-primary students, which reduces the cognitive overload making it possible to use high-level processes such as planning and revision (Berninger & Winn, 2006). Also, previous studies have shown that, at the end of Primary Education, students are able to manage the high-level writing processes (Koutsoftas & Gray, 2013; Limpo et al., 2014; Limpo &

Alves, 2013; Whitaker et al., 1994). However, despite students seem to be in a suitable developmental stage and are, supposedly, sufficiently skilled to handle such processes, they rarely use them during their natural writing process. This was true even for argumentative writing, which, due to its characteristics, demands a greater use of high cognitive level processes as opposed to other textual typologies such as narrative.

2º.- In relation to the time the students devoted to the different writing processes, it could be concluded that upper-primary students followed the "knowledge-telling strategy" proposed by Bereiter and Scardamalia (1987) when writing argumentative texts, text genre they were unfamiliar with. This strategy is usually used by writers who have a text genre scheme available in the long-term memory, so they are able to compose a coherent and high-quality text without the need to reorganize the information or evaluate it. However, the low quality of students' texts suggests that this is not an effective strategy to compose argumentative texts, at least at the end of Primary Education. There can be two possible reasons to explain this. First, students at this age are not familiar with argumentative writing, so they might not have the necessary information about this text genre to be able to follow the "knowledge-telling strategy" effectively. Moreover, it has been shown that, even in expert writers, argumentative writing demands the activation of high-level processes, especially those related to goal setting and organization planning subprocesses (Beauvais, Olive, & Passerault, 2011).

3º.- Upper-primary students seem to follow a linear and non-recursive writing process for the writing of argumentative texts. The results showed that students mainly activate planning processes during the initial stage of writing. Revision, in turn, on the rare occasions when it occurred, tended to appear at the end of the writing process. This suggests that although writing has been generally defined as a recursive process in which writers simultaneously activate the different writing processes (Hayes & Flower, 1980), this is not true for all learners, particularly for upper-primary students This may be due to the instruction received in schools, where students are generally encouraged to write in a sequential way in which they fist plan what to say, then write it down and finally revise it (Gilbert & Graham, 2010). Another possible reason could be that students at these ages are not yet prepared to handle such processes in a recursive way, given that this is a feature of expert writing (Koutsoftas & Grey, 2013).

4º.- From the results, it could be concluded that there is no relationship between the writing process of upper-primary students, considering both the time devoted to different writing processes and their temporal distribution during composition, and the quality of students' argumentative texts. This can be easily explained if one considers that students in the last stage of Primary Education hardly make use of high-level processes such as planning and textual revision, as it was pointed out in the first conclusion presented. These processes are, however, particularly relevant for the writing of high-quality argumentative texts, not only in young people but also in adults writers (see Berninger, 2012 for a review). However, it is necessary to consider that even when students made use of these high-level cognitive processes, this was not related to the writing of higher quality texts. Therefore, it is suggested that upper-primary students' use of writing processes might be ineffective, regardless of the time devoted to them or the moment during the composition in which they are activated.

Once the conclusions have been presented, the **contributions** derived from them are presented below.

1º.- First, as a contribution to the scientific field, to the best of our knowledge, this is the first study that have explored the writing process of upper-primary students in detail through the use on online measures. Thus, not only the writing process of upper-primary students was analyzed, but also the distribution of writing processes during composition and the relationship of both aspects with textual quality. That investigation is relevant for two reasons. First, the results found in this research confirm that upper-primary students make inefficient use of high-level processes, which is in line with the results found in previous studies through the use of offline measures (Limpo et al., 2014; Whitaker et al., 1994). Second, and arguably more important, this study fills an existing research gap related to the analysis of the upper-primary students writing process in a comprehensive way through the use of online measures. This has allowed us to obtain useful and relevant information about students' use of writing processes and subprocesses, their temporal distribution during composition, or the relation of both aspects to text quality. This information is particularly important since it allows us to comprehensively understand what needs or difficulties upper-primary students have, which will undoubtedly contribute to the design of writing interventions adjusted to the students' needs, thereby resulting in a greater students' performance in writing.

2º.- Moreover, as a contribution to the educational field, based on the results it seems necessary that upper-primary students receive instruction that allows them to acquire a self-regulated control of high-level writing processes such as planning and revision. Thus, students would be capable of using them in an effective way, which, in turn, would improve their writing competence. To this end, it would be essential to implement evidence-based writing instructional practices in schools in order to improve upper-primary students' writing competence. In this context, from an exhaustive review of empirical studies in the instructional research field, it was possible to determine that strategy instruction is one of the most effective instructional approaches for the improvement of students' writing competence (see Graham & Harris 2018 for a meta-analysis of meta-analyses). This instructional approach aims to teach students to self-regulated their own writing process through the use of planning and revising strategies. Therefore, in order to provide students with the opportunity to become proficient writers, strategy instruction would be one of the most suitable approaches for their implementation in real classroom settings.

Finally, the conclusions and contributions previously presented must be considered within the **limitations of the research** presented, around which **future lines of research** are proposed.

1º.- One of the limitations is related to the sample participating in the study, given that the results obtained may vary depending on the educational context in which the students have been previously instructed. In this study, all students had previously been instructed in the Spanish educational context, in which writing instruction generally focuses on providing students with knowledge of different textual genres, with great emphasis on mechanical aspects and without any kind of self-regulated instruction on the use of planning and revision processes. It should also be noted that all students belonged to the same school. Therefore, it would be necessary to replicate the present study with students instructed in different educational contexts and schools. This would provide a greater sample of students and therefore, better generalization of the results obtained. This would make it possible to obtain a comprehensive picture about upper-primary students' writing process, considering the particular features of the different educational contexts in which they have been instructed. Finally, it is necessary to point out that the sample considered in the present research belongs to a single age cohort, so we only have a limited picture of elementary school students' writing process. In this context, in spite of

going beyond what is proposed in the present dissertation, it would be interesting to analyze in a comprehensive way, the writing process of students at different educational stages. In this way, it would be possible to obtain a detailed picture of students' writing process throughout schooling and its relationship with text quality, providing information about the changes that may occur during this period. This data might contribute to extend the research on developmental theories of writing.

2º.- Another limitation of the present research is that the writing process seems to vary according to the text genre considered (Beauvais et al., 2011). In the present study, we decided to focus only on argumentative writing, since we assumed that, due to its characteristics, it would demand a greater use of high-level writing processes from the writers in comparison with other genres, such as narrative. However, it would be advisable for future research to explore how students' writing process looks like in other text genre varying in terms of level of difficulty, students' knowledge about them and so on. All this would allow to analyse the possible influence of these variables in the students' writing process and the relation between the quality of different texts written by upper-primary students.

3º.- Finally, another limitation is related to the assessment of the writing process through the use of online measures. It is necessary to consider that collecting data from upper-primary students' writing processes through online measures is, generally, problematic. In the present study, the use of thinking aloud might have imposed greater cognitive demands on the students, thereby influencing their writing process and, subsequently, the quality of their written compositions. However, in the field of written composition, previous research has shown that asking writers to verbalize their actions and thoughts during composition does not have any effect on students' writing process or the quality of their compositions, though it does decrease writing fluency (Olive, Kellogg, & Piolat, 2002). However, it is necessary to consider that these studies were implemented with older and more competent writers than those in the present study, with research with younger students being non-existent. Therefore, future research would need to analyse the reactivity of the thinking aloud measures in the writing process of upper-primary students and in the resulting quality of students' texts. Similarly, it would also be interesting to triangulate the data collected with other kind of less intrusive online measures, with the aim to evaluate students' writing in-depth. In particular, the use of smartpens seems to be one of the most suitable online measures for upper-primary

students. These digital devices allow us to collect real time data about students' writing process. This would undoubtedly allow to explore the dynamics of writing in a complementary way, in terms of bursts and pauses, considering both their duration and location in the text. This line of research is consistent with the last scientific international advances (Alves, Leal, & Limpo, 2019; Alves & Limpo, 2015; Barbier & Spinelli-Jullien, 2009; López & Fidalgo, 2018).

Component Analysis of Strategy Instruction for the Improvement of Upper-primary Students' Writing Competence

The second and main research line of this dissertation focused on the analysis of strategy instruction for the improvement of upper-primary students' written competence from a componential point of view. The relevance and contribution to the scientific field of this research line is not simply related to the effectiveness of a certain strategy program for the improvement of students writing competence. This has already been proved by previous literature, which points to strategy-focused instruction as the most effective instructional approach for the improvement of students' writing skills (Graham & Harris, 2018). The scientific contribution of this focus of study goes beyond. It relies in the analysis of the effects that different components and instructional contents usually included in strategy instruction have for the improvement of upper-primary students' writing competence. This line of research is of great relevance nowadays in the international context (De la Paz, 2007; Fidalgo, Torrance, Rijlaarsdam, Van den Bergh, & Álvarez, 2015; Graham & Perin, 2007; Rijlaarsdam et al., 2008; Torrance, Fidalgo, & Robledo, 2015). This scientific contribution is particularly relevant when one realises that the complex and multicomponent nature of this kind of instruction has negative implications at the scientific and educational level. First, from a scientific point of view, it makes it difficult to know the mechanisms by which strategy instruction is effective to improve students' written competence. In other words, considering that strategy interventions generally include a wide range of instructional contents and components generally and their efficacy is usually assessed globally, it is not possible to know which components and contents are actually responsible for the improvement students' writing skills. On the other hand, from an educational point of view, the implementation of this kind of instructional programs in real classroom settings is frequently problematic. This is mainly because its implementation in the classroom would require, first, a considerable amount of time, and second, teacher training on the different instructional techniques

involved in strategy instruction. These difficulties could be reduced if the complex instructional sequence of strategy instruction were optimized. To achieve this, a detailed analysis of the effects of the different instructional contents and components generally included in this type of instruction is essential.

In this context, after the design and implementation of two instructional and one descriptive studies focused on this research line, it is possible to present the following **general conclusions**.

1º.- Strategy instruction programs focused on planning and revision processes have shown to be effective in improving the writing competence of students in the final years of Primary Education. This effectiveness is evidenced by a significant improvement in the overall quality of the texts written by the students, measured in terms of structure, coherence and quality, after their participation in these strategy instructional programs. It is worth noting that this significant improvement was obtained even when the effects of instruction were compared with those obtained in not business-as-usual control groups. In our control groups, we also implemented writing interventions that have proved effective for the improvement of students writing skills, such as text structure analysis (Bouwer & Koster, 2016; Rietdijk, Janssen, Van Weijen, Van den Bergh, Rijlaarsdam, 2017). It is also necessary to point out that the positive effects of strategy instruction on students' writing competence was found even after short instructional programs (between two and four sessions). This conclusion is consistent with the results obtained in previous research in two levels: a general level related to the effectiveness of strategy instruction for improving the writing competence of students of all ages compared with other instructional approaches (Graham, 2006; Graham & Harris, 2018; Graham, McKeown, Kiuhara, & Harris, 2012; Koster, Tribushinina, De Jong, & Van den Bergh, 2015); and a specific level related to the need and importance of instructing upper-primary students in high-level processes such as planning and revision for the writing of high quality texts (Graham & Harris, 2000; Harris, Santangelo, & Graham, 2010; Zimmerman & Risemberg, 1997).

2º.- Regarding the componential analysis of strategy instruction considering its instructional components, it is possible to conclude that both modelling and direct instruction are equally effective for instructing upper-primary students in high-level processes, which results in an increase of the quality of students' texts as it was shown in

the instructional studies included in this dissertation. In other words, based on the results obtained, it could be concluded that students, at least at these ages, do not need to be explicitly instructed in planning and revision strategies through the use of mnemonics, but rather they have the necessary cognitive skills to be able to infer the knowledge through learning by observation, as it has been corroborated in previous research (e.g., Fidalgo et al., 2015). It is important to consider that this conclusion seems to be especially consistent, since the direct comparison of both instructional components in the first instructional study showed that these techniques are equally effective regardless of the type of assessment task implemented (collaborative or individual) or the students' level of writing competence (considering the scores they obtained at pre-test). Such findings would, therefore, confirm the results found in previous research about the effectiveness of both components, determining that at least in upper-primary students without learning disabilities both techniques are equally effective for the improvement of their writing competence.

3º.- As for the contents typically included within strategy instruction, the results obtained in this dissertation allow us to conclude that instruction in planning strategies is highly effective in improving students' written competence at the end of the elementary school. This result is in line with previous research (Graham et al., 2012; Graham & Perin, 2007; Sadler, Moran, Graham, & Harris, 2017). In fact, previous studies have shown that even in very young students (6 years old), in which low cognitive processes are expected to entail a great cognitive cost that prevents them from effectively using high-level cognitive processes, planning instruction has proved to be effective (Arrimada, Torrance, & Fidalgo, 2018). However, a particularly relevant conclusion is that instructing students on revision processes provides additional benefits on text quality and revision skills than instructing them just on planning processes focuses on establishing communicative goals. From our knowledge, no studies have explored this issued before, with our studies, therefore, overcoming an information gap in the writing research instructional field. Also, it is important to consider that goal setting instruction have shown to be effective to improve not only students' writing competence (Koster et al., 2015) but also their revision skills (MacArthur, 2012; 2016).

This conclusion seems to be especially relevant, given that it provides information on the positive effects of instructing students in both processes, something that had been

questioned in previous research for developmental and motivational reasons (Berninger & Swanson, 1994; Fidalgo, 2005; Torrance, Fidalgo, & García, 2007).

4º.- Again in relation to the instructional content, it is possible to conclude that revision instruction is equally effective both through the explicit instruction of revision strategies supported by the use of mnemonics or through the promotion of audience awareness, at least in upper-primary students. It is noteworthy that both instructional approaches proved effective in improving both the quality of the students' writing outputs and their revision skills in relation to the detection and correction of substantive errors. This is particularly relevant, as these kinds of substantive revisions have shown to be related to the composition of high-quality texts (Limpo et al., 2014; MacArthur, 2018). Also, these effects are consistent, given that the improvement in students' writing competence was maintained two months after the end of the intervention as well as transferred to an untaught text genre. These results are consistent with previous research in which the effectiveness of both approaches was assessed independently (Graham & Harris, 2018; Pritchard & Honeycutt, 2006). However, it provides new information given that no previous studies, from our knowledge, have explored the effect of both contents in a comparative way. Also, it is the first study that have shown the positive effects of instructing specifically upper-primary students following the audience awareness instructional approach for the improvement of their written competence (for review see Rijlaarsdam et al., 2008). Thus, the results of this study show that it is not necessary to instruct students in explicit revision strategies. Instead, the students can infer the necessary knowledge related to the revision process that allow them to improve their written competence and their revision skills just through the modelling implemented by a reader during the reading of imperfect texts.

5º.- Finally, it seems appropriate to conclude that the use of a report system that allows exhaustive analysis and comparison of writing interventions at both the content and instructional design level, is not only relevant for research dissemination (see the scientific and educational repercussions that have been pointed out in previous chapters) but also for designing interventions. The use of such a reporting system could help researchers to follow a standard in which they would have to define and justify in a specific way, both theoretically and empirically, the choice of the different contents included in the intervention and its aims, as well as the instructional design implemented for their achievement. Such a detailed analysis of interventions in the design phase would

provide key information about possible errors or gaps in their rationale and/or instructional design, which would be critical in assessing the validity of writing interventions prior to their implementation with students. This, therefore, would be a similar process to the analysis of the validity and reliability of the assessment instruments for evaluating the dependent variables considered in empirical studies, which is crucial in their design. This kind of analysis, however, are usually forgotten when it comes to the independent variable, despite being crucial in order to ensure the validity of the intervention.

Once the general conclusions from this dimension of the study have been presented, the **contributions** derived from it are reported below.

1º.- In this dissertation we have empirically validated the effectiveness of two strategy instructional programs focused on the strategic and self-regulated mastery of high-level writing processes such as planning and revision for the improvement of upper-primary students' writing competence, which can be feasibly implemented in real classroom settings by ordinary elementary schools teachers. It is important to notice that, specifically in the second instructional study, it was found that this kind of instruction has direct implications on the revision skills of students at these ages. This aspect is especially relevant given that, as it was concluded in the first study of the dissertation (p. 97), upper-primary students show serious difficulties in the use of this kind of process. Thus, the contribution to the educational field is clear: it is essential to have instructional practices whose effectiveness has been empirically validated for the improvement of a deficient area in elementary students, such as writing competence, as has been shown by different national reports (Ministerio de Educación, 2010; 2011).

2º.- The analysis of the effects of the different instructional components typically included in strategy instruction, in this case in relation to the direct instruction and modelling instructional techniques, is key to facilitate the transfer of this instructional approach to the educational field. This is especially important given its high effectiveness in improving students' written competence. In this sense, it is necessary to consider that it can be difficult for teachers to implement a strategy program for the teaching of writing as a whole in their classrooms. On the one hand, this may be due, to the inflexible curricular programs established in schools to which teachers must adapt, and, on the other hand, to the need to train teachers in order to provide them with the needed knowledge

and skills for the effective application of these programs in the classroom. For this reason, providing specific information on the effectiveness of certain instructional techniques, such as modelling or direct instruction of strategies, can facilitate the applicability of this type of program in schools and make its implementation in the classroom easier for teachers.

3º.- Regarding the component analysis of strategy instruction in relation to planning and revision processes, this contributes to the educational field since it shows the greater pertinence of instructing upper-primary students in a comprehensive way in both processes. This will ensure a greater effectiveness of instructional programs for the improvement of students' writing competence at these ages.

On the other hand, the conclusions offered also have significant **contributions** at the scientific level.

4º.- The scientific contribution of the report system of writing interventions proposed and exemplified in this dissertation is related to two phases of the scientific method: the design and the dissemination stages. Regarding the design phase, this report system can be a key tool to facilitate the design of the proposed writing instructional programs. Also, it might serve as a tool to check validity of these interventions according to the instructional approaches and aims set previous to their implementation with the students. With regard to the dissemination phase, this report system can be used in scientific publications, which would significantly expand scientific knowledge on both developmental theories of writing and instructional psychology, as it was discussed in previous chapters (chapter 6, p. 175).

5º.- At the scientific level, it can be concluded that, in relation to the componential analysis of strategy instruction, it does not seem necessary to explicitly instruct students in planning and revision strategies through direct instruction based on the use of mnemonics. In seems to be that, at least with students in the last years of Primary Education without learning difficulties, learners are able to infer key writing knowledge which revert to greater textual quality of their written compositions through learning by observation, as previous studies have demonstrated (Braaksma et al., 2004; Rijlaarsdam et al., 2008).

Finally, it is necessary to refer to certain **limitations or research gaps**, which, in turn. open **future lines of research** to address.

1º.- One of the most important limitations of this research, shared by both instructional studies, is that the effects of the intervention were considered in a partial way, since we just analyze their effects through the analysis of students' writing outputs. This is an important limitation, since one of the main aims of strategy instruction is to promote students' use of a self-regulated writing process (Graham & Harris, 2018). Therefore, it seems necessary to explore the effects of strategy instruction, both as a whole, and also considering the effects of different content and instructional components on the students' writing process, through the use of online measures in future studies. In fact, in the context of the research included in this dissertation, this aspect seems even more necessary. The analysis of the writing process could provide information about the differential effects that direct instruction or modelling might have on the students' writing process. In exactly the same way, valuable information on the instructional content could be obtained by analyzing specific changes in planning and revision processes, and their influence on the quality of students' texts. In this same line, it would also have been suitable to carry out a comprehensive evaluation of other variables that may have varied as a result of the intervention, such as: students' writing strategies, metacognitive knowledge or their motivation, among others. This would have provided a comprehensive picture of the effects of the different content and instructional components. Moreover, in line with the detailed analysis of intermediate learning objectives included in the report system proposed in this dissertation, it would have been interesting to measure to what extent these intermediate learning objectives were achieved. This would provide key information on the changes that underlie instruction on different contents typically included on strategy instruction and, in turn, on the link between instructional design and student learning. This would be key to the advancement of scientific knowledge in both the instructional and writing composition domains.

2º.- It is necessary to point out that the sample in both instructional studies comprised typically-developing students in the last two years of Primary Education. In this sense, the results obtained may vary considerably with other types of students. Thus, in order to generalize the results obtained, it would be interesting to explore the effectiveness of different contents and components of strategy instruction in other kind of populations, such as, for example, students with learning disabilities, younger students,

etc. Understanding the effects of the different instructional contents and components in different populations would provide useful information from educational and scientific points of view. From an educational level, it would allow to design writing instructional programs as tailored as possible to students' needs. Also, from a scientific perspective, it would inform on developmental and instructional theories of writing.

3º.- In both instructional studies, the interventions were implemented by the researchers themselves and not by the ordinary teachers of Spanish Language and Literature, the subject in which the teaching of writing is explicitly considered. While this does not limit the conclusions of the study, it does limit the transfer of knowledge from the scientific to the educational field. If teachers are not involved in writing instructional studies, it is difficult to expect them to apply this kind of effective instructional in their regular classroom once the intervention is over. Therefore, future research should consider involving teachers in instructional studies in a meaningful way, providing them with the opportunity to participate in professional development programs around the mastery of evidence-based practices for the improvement of students' written competence, such as strategy instruction. Teacher training would enable them to use such practices effectively and autonomously in their ordinary classrooms, line of research around which we are currently working.

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8 Conclusiones

El trabajo desarrollado a lo largo de esta tesis doctoral se enmarca dentro de dos focos de interés y análisis. El primero de ellos, se centra en el análisis del proceso de escritura de los estudiantes de últimos cursos de Educación Primaria de manera pormenorizada a través del uso de medidas online. Por su parte, el segundo eje, foco principal de la tesis, se centra en el análisis de la efectividad de la instrucción estratégica desde un punto de vista componencial, analizando los efectos que diferentes componentes y contenidos instruccionales tienen sobre la mejora de la competencia escrita del alumnado en últimos cursos de Educación Primaria. Dichos focos de estudio se han operacionalizado a través del diseño e implementación de los cuatro estudios empíricos que constituyen el cuerpo de esta tesis doctoral, los cuales han sido presentados a lo largo de los anteriores capítulos (capítulos tres al seis). A pesar de que en cada capítulo se han especificado y discutido los resultados y conclusiones derivadas de cada uno de los estudios de forma individual, las conclusiones generales de la tesis van más allá.

Por tanto, el objetivo principal de este capítulo se centra en proporcionar una visión global de las conclusiones derivadas de la investigación contenida en la tesis doctoral. Igualmente, se expondrán las aportaciones que dichas conclusiones tienen tanto a nivel científico como educativo, así como las limitaciones o lagunas de investigación detectadas y futuras líneas de investigación a seguir.

Con el fin de facilitar la lectura y organización del capítulo, se expondrán las conclusiones generales obtenidas en la presente tesis doctoral en base a los dos ámbitos de estudio anteriormente mencionados, es decir, la evaluación del proceso de escritura del alumnado de últimos cursos de Educación Primaria a través de medidas online y por otro lado, el análisis componencial de la instrucción estratégica y autorregulada. Igualmente, y de acuerdo con la normativa que regula la estructura de las tesis doctorales presentadas con mención internacional, este capítulo constituye una réplica es español del capítulo anterior.

Evaluación del Proceso de Escritura del Alumnado de Últimos Cursos de Educación Primaria a través de Medidas Online

El primer foco de estudio de la tesis doctoral se centró en evaluar de manera pormenorizada el proceso de escritura de los estudiantes de últimos cursos de Educación Primaria (5º y 6º) a través del uso de medidas online, analizando no sólo cuánto tiempo

dedican los estudiantes a los diferentes procesos de escritura o cómo distribuyen dichos procesos durante el tiempo de composición sino también la relación entre ambos aspectos y la calidad textual resultante de las composiciones del alumnado. El establecimiento de dicho objetivo surgió ante la necesidad de conocer de forma precisa cuál es el proceso de escritura del alumnado de últimos cursos de Educación Primaria como punto de partida para el diseño e implementación de intervenciones para la mejora de la competencia escrita eficaces y lo más ajustadas posible a las necesidades del alumnado, segundo foco y eje central de la presente tesis. En relación a este campo, a partir de la revisión de la literatura científica realizada, se pudo comprobar la escasez de estudios empíricos centrados en analizar el proceso o habilidades de escritura de los estudiantes en últimos cursos de primaria (Koutsoftas & Gray, 2013; Limpo, Alves, & Fidalgo, 2014; Whitaker, Berninger, Johnston, & Swanson, 1994). A su vez, una revisión de los mismos permitió constatar la existencia de determinadas lagunas de investigación principalmente relacionadas con la metodología implementada. Así, se pudo comprobar que el análisis del proceso de escritura del alumnado se realizó a través de medidas offline, bien a través de la aplicación de tareas de escritura implementadas de manera lineal en las que se exigía al alumnado planificar, escribir y revisar durante un determinado periodo de tiempo, o a través de tareas específicas diseñadas ad hoc para evaluar un determinado proceso de escritura (Limpo et al., 2014; Whitaker et al., 1994). Por tanto, ninguno de estos estudios evaluó realmente el proceso de escritura del alumnado sino su habilidad para utilizar los principales procesos de planificación, redacción y revisión. Dicha limitación justifica y contextualiza la relevancia del primer foco de estudio de la tesis. En este contexto, se implementó un estudio diseñado para suplir dicha limitación y proporcionar así información detallada sobre el proceso de escritura de los estudiantes de últimos cursos de Educación Primaria y la relación de éste con la calidad textual. En base a los resultados obtenidos es posible establecer las siguientes **conclusiones generales**.

1º.- En los últimos cursos de Educación Primaria el alumnado dedica la mayor parte del tiempo de composición a escribir sus ideas directamente en el papel, haciendo un escaso uso de procesos cruciales para la escritura de textos argumentativos de calidad como son la planificación y revisión textual. Igualmente, un análisis pormenorizado de los diferentes subprocesos relacionados con la planificación y revisión ha permitido conocer que dichos estudiantes dedican la mayor parte de su tiempo de planificación a la generación de contenido, sin recurrir generalmente a los subprocesos de establecimiento

de objetivos y organización de la información, mientras que el principal subproceso relacionado con la revisión fue la lectura, sin aplicar en general procesos de evaluación o edición a nivel mecánico ni sustantivo. Dicha información resulta especialmente relevante dado que complementa los resultados obtenidos en investigaciones previas. En primer lugar, de acuerdo con las teorías del desarrollo escritor, los escritores en los últimos cursos de Educación Primaria tienen un mayor nivel de automatización de los procesos de bajo nivel cognitivo, lo que favorecería el uso de procesos de alto nivel como la planificación y revisión textual (Berninger & Winn, 2006). Por su parte, estudios previos han evidenciado que al final de la etapa de Educación Primaria los estudiantes son capaces de manejar los diferentes procesos de escritura (Koutsoftas & Gray, 2013; Limpo et al., 2014; Limpo & Alves, 2013; Whitaker et al., 1994). Sin embargo, los datos recogidos en la presente tesis parecen evidenciar que a pesar de encontrarse en una etapa evolutiva adecuada para su uso o contar con la habilidad necesaria para manejar dichos procesos, estos alumnos raramente los utilizan durante su proceso de escritura de forma espontánea, incluso en géneros textuales como es el argumentativo el cual por sus características demanda un mayor uso de procesos de alto nivel cognitivo frente a otras tipologías textuales como la narrativa.

2º.- En relación con el tiempo dedicado por los estudiantes a los diferentes procesos de escritura señalado anteriormente, podría concluirse que los estudiantes de últimos cursos de Educación Primaria siguieron para la escritura de textos argumentativos, género textual con el que no están familiarizados, un proceso de escritura que se identifica con la estrategia de "contar el conocimiento" propuesta por Bereiter y Scarcamalia (1987). Dicha estrategia suele ser utilizada por escritores que tienen un esquema disponible sobre una determinada tipología textual en la memoria a largo plazo por lo que son capaces de componer un texto coherente y de calidad sin necesidad de reorganizar la información generada o evaluarla. Sin embargo, la baja calidad de los textos escritos por el alumnado pondría de manifiesto que ésta no resulta una estrategia efectiva para la escritura de textos argumentativos, al menos en alumnado en estas edades. Esto podría explicarse por dos motivos. En primer lugar, en estas edades el alumnado no suele estar familiarizado con la escritura de textos argumentativos, por lo que es difícil que cuente con la información necesaria sobre esta tipología textual para poder seguir la estrategia de "contar el conocimiento" de forma efectiva. Por otra parte, se ha demostrado que incluso en escritores expertos, la tipología textual argumentativa demanda que éstos

activen procesos de alto nivel cognitivo especialmente relacionados con los subprocesos de planificación de establecimiento de objetivos y organización de la información (Beauvais, Olive, & Passerault, 2011).

3º.- El proceso de escritura del alumnado al final de la Educación Primaria es un proceso lineal y no recursivo al menos en relación a la escritura de textos argumentativos. Los resultados obtenidos han puesto de manifiesto que los estudiantes activan los procesos de planificación principalmente durante los primeros momentos de escritura mientras que los procesos de revisión, en las escasas situaciones en que son utilizados, se activan al final. Esto parece evidenciar que a pesar de que la escritura se concibe como un proceso recursivo en el que los escritores activan de manera simultánea los diferentes procesos de escritura (Hayes & Flower, 1980), al menos el alumnado de últimos cursos de Educación Primaria parece seguir un proceso de escritura más lineal. Esto podría deberse a la instrucción recibida en los centros educativos, en los que en general se instruye al alumnado para que escriban de forma secuencial de manera que primero planifiquen, luego escriban y por último revisen sus composiciones (Gilbert & Graham, 2010). Otra posible explicación podría ser que el alumnado en estas edades no está preparado aún para manejar dichos procesos de manera recursiva, siendo ésta una característica de la escritura experta (Koutsoftas & Grey, 2013).

4º.- A partir de los resultados obtenidos podría concluirse que no existe una relación entre el proceso de escritura de los estudiantes en la última etapa de Educación Primaria, considerando tanto el tiempo dedicado a los diferentes procesos de escritura como su distribución temporal durante la composición, y la calidad textual de sus composiciones escritas, al menos para la tipología textual argumentativa. Este hecho podría explicarse fácilmente si se considera que en la última etapa de Educación Primaria el alumnado apenas hace uso de procesos de alto nivel cognitivo como la planificación y revisión textual, como se señaló en la primera conclusión presentada, los cuales son especialmente relevantes para la escritura de textos de calidad no sólo en jóvenes si no también en adultos (para revisión ver Berninger, 2012). Sin embargo, es necesario tener en cuenta que incluso cuando los estudiantes hicieron uso de procesos de alto nivel cognitivo, esto no se relacionó con la escritura de textos de mayor calidad. Es por ello que podría concluirse que el uso que dichos estudiantes hacen de los diferentes procesos de escritura, parece ser ineficaz, independientemente del tiempo dedicado a los mismos o el momento durante la composición en el que los utilicen.

Una vez expuestas las conclusiones, se presentan a continuación las **aportaciones** derivadas de las mismas.

1º.- En primer lugar, como aportación al ámbito científico, desde nuestro conocimiento, este es el primer trabajo de investigación que aborda el estudio del proceso de escritura del alumnado en los últimos cursos de Educación Primaria de forma pormenorizada a través del uso de medidas online, analizando no sólo el proceso de escritura de dicho alumnado sino su recursividad y la relación de ambos aspectos con la calidad textual. Dicha investigación resulta relevante por dos motivos. En primer lugar, los resultados encontrados en la presente investigación corroboran que los estudiantes de últimos cursos de Educación Primaria hacen un uso ineficaz de los procesos de alto nivel cognitivo, resultado coherente con lo encontrado en estudios previos a través del uso de medidas offline (Limpo et al., 2014; Whitaker et al., 1994). Mientras que, por otra parte, dicho estudio cubre una laguna de investigación existente relacionada con el análisis del proceso de escritura de los estudiantes de estas edades de forma pormenorizada, lo que ha permitido obtener información con la que no se contaba, desde nuestro conocimiento, relacionada con el uso que los estudiantes hacen de los diferentes procesos y subprocesos de escritura, la distribución de los mismos durante su proceso de composición así como la falta de relación entre ambos aspectos y la calidad textual de las composiciones de los estudiantes. Esta información parece especialmente relevante dado que permite conocer de forma comprehensiva qué necesidades o dificultades tienen los estudiantes de estas edades, lo que sin duda contribuirá al diseño de intervenciones de escritura ajustadas a sus necesidades repercutiendo en un mayor rendimiento escritor del alumnado.

2º.- Por su parte, como aportación al ámbito educativo, a partir de los resultados y conclusiones obtenidas parece necesario que el alumnado de los últimos cursos de Educación Primaria reciba una instrucción que permita el logro de un dominio autorregulado de los procesos de alto nivel cognitivo de la escritura como son la planificación y revisión textual, logrando un uso efectivo de los mismos que revierta en una mejora de la calidad de sus composiciones escritas. Para ello, sería fundamental que en los centros educativos se implementasen prácticas instruccionales que hayan demostrado ser efectivas a nivel científico para la mejora de la competencia escrita del alumnado. En este contexto, a partir de la revisión empírica del campo instruccional realizada, se ha podido determinar que uno de los enfoques instruccionales más efectivos para la mejora de la competencia escrita del alumnado, el cual tiene precisamente como

objetivo que los estudiantes adquieran un proceso de escritura autorregulado a través del uso de estrategias de planificación y revisión, es la denominada instrucción estratégica y autorregulada (Graham & Harris 2018 para ver un meta-análisis de meta-análisis). Por ello, con el fin de proporcionar al alumnado la oportunidad de comunicarse por escrito de manera efectiva, la instrucción estratégica se expondría como uno de los enfoques más recomendables para su aplicación en las aulas.

Por último, las conclusiones y aportaciones presentadas deben ser consideradas dentro de las propias **limitaciones** de la investigación presentada, en torno a las cuales se plantean **futuras líneas de investigación** a seguir.

1º.- Una de las limitaciones está ligada a la muestra considerada, dado que los resultados obtenidos pueden variar en función del contexto educativo en el que los estudiantes han sido instruidos. En este sentido, todos los estudiantes habían sido instruidos previamente en el contexto educativo español, en el que generalmente la instrucción en escritura se ha centrado en proporcionar al alumnado conocimiento sobre las diferentes tipologías textuales, con un gran énfasis en aspectos mecánicos, sin ningún tipo de instrucción en procedimientos de autorregulación relacionados con los procesos de planificación y revisión textual. Igualmente, es necesario señalar que todos los estudiantes pertenecían al mismo centro educativo. Por lo tanto, sería necesario que dicho estudio fuese replicado en futuras investigaciones considerando alumnado que haya sido instruido en diferentes contextos y centros educativos, contando con una mayor muestra de estudiantes y por tanto proporcionando una mayor generalización de los resultados obtenidos. Esto permitiría obtener una visión comprehensiva del proceso de escritura del alumnado en éstas edades considerando las características particulares de los diferentes contextos educativos en los que han sido instruidos. Por último, es necesario señalar que la muestra considerada en el presente trabajo de investigación pertenece a un único cohorte de edad, por lo que tan sólo se ha podido proporcionar una visión limitada del proceso de escritura del alumnado en la última etapa de Educación Primaria. En este sentido, a pesar de ir más allá de lo planteado en la presente tesis, sería interesante que en futuros estudios se analizase el proceso de escritura de los estudiantes de forma comprehensiva, tal y cómo se ha realizado en la presente investigación, considerando alumnado de otros cursos. De esta forma se podría obtener una visión detallada del proceso de escritura del alumnado a lo largo del proceso de escolarización y la relación de este con la calidad textual, constatando los cambios que pueden producirse durante

este periodo. Esto podría proporcionar información relevante que podría ser considerada en las teorías del desarrollo escritor en los estudiantes.

2º.- Otra limitación que debe considerarse es que el proceso de escritura parece variar en función del género textual considerado (Beauvais et al., 2011). En este sentido, el presente estudio se centró únicamente en la escritura de textos argumentativos, al asumirse que esta tipología textual, por sus características, tendría un mayor nivel de exigencia en los escritores, demandando una utilización mayor de procesos de alto nivel cognitivo como la planificación y revisión en comparación con otros géneros textuales, como el narrativo. Sin embargo, sería recomendable que futuras investigaciones explorasen cuál es el proceso de escritura del alumnado en diferentes géneros textuales, que variarán en el grado de dificultad y dominio por parte del alumnado, así como en el nivel de conocimiento de la tipología textual. Todo ello abriría la puerta a analizar la posible influencia que otras variables como la tipología textual, el grado de conocimiento metacognitivo de la tipología textual, las actitudes hacia las tipologías textuales, etc., podrían jugar en el proceso de composición escrita y su relación o aportación a la calidad textual final de las composiciones del alumnado.

3º.- Finalmente, otra limitación está ligada a la evaluación del proceso de escritura a través de medidas online que se ha implementado en esta investigación. Es necesario considerar que la obtención de datos sobre el proceso de escritura de los estudiantes en la última etapa de Educación Primaria a través del uso de medidas online, es en general problemático. En este sentido, el uso de la técnica de pensamiento en voz alta considerada en el presente estudio podría haber supuesto un incremento de la demanda cognitiva del alumnado, lo que habría podido influir en su proceso de escritura y por ende también en la calidad de sus composiciones escritas. Sin embargo, en el ámbito de la composición escrita se ha evidenciado que pedir a los escritores que verbalicen sus acciones y pensamientos durante el proceso de composición no afecta ni a las estrategias de escritura ni a la calidad textual, reduciendo tan sólo la fluidez de los escritores (Olive, Kellogg, & Piolat, 2002). A pesar de ello, es necesario considerar que dichos estudios han sido implementados con participantes de mayor edad y nivel de competencia que los considerados en el presente estudio, careciendo de investigaciones en estudiantes de menor edad. Por todo ello, sería necesario el planteamiento de investigaciones futuras que analicen la reactividad de esta técnica en el proceso de escritura del alumnado de estas edades y en el producto textual resultante. De igual forma, también resultaría interesante

triangular los datos recogidos con otro tipo de técnicas online de carácter menos intrusivo que permitiesen evaluar dicho proceso de manera exhaustiva. En este sentido, el registro a través de smartpens, el cual permite recoger información sobre el proceso de escritura del alumnado en tiempo real, permitiría estudiar de forma complementaria la dinámica del proceso escritor en términos de pausas y ejecuciones, considerando tanto su duración como localización en el texto; línea de investigación coherente con los últimos avances científicos a nivel internacional (Alves, Leal, & Limpo, 2019; Alves & Limpo, 2015; Barbier & Spinelli-Jullien, 2009; López & Fidalgo, 2018).

Análisis de la Efectividad de la Instrucción Estratégica para la Mejora de la Competencia Escrita de Alumnado de Últimos Cursos de Educación Primaria desde un Punto de Vista Componencial

El segundo y principal foco de estudio de la presente tesis doctoral se centró en el análisis de la instrucción estratégica y autorregulada para la mejora de la competencia escrita del alumnado de últimos cursos de Educación Primaria desde un punto de vista componencial. La relevancia y aportaciones al campo científico de dicho foco de estudio no proviene simplemente de la comprobación de la eficacia de un determinado programa de carácter estratégico para la mejora de la competencia escrita del alumnado, ya que como se ha concluido a partir de la revisión empírica del campo de conocimiento realizada en el capítulo introductorio, dicho tipo de instrucción ha demostrado ser altamente eficaz para la mejora de las habilidades de escritura del alumnado en todos los niveles educativos (Graham & Harris, 2018). La aportación científica de dicho foco de estudio radica en el análisis de la efectividad que diferentes componentes y contenidos instruccionales incluidos comúnmente en la instrucción estratégica, tienen en la mejora de la competencia escrita del alumnado al final de la etapa de Educación Primaria; línea de investigación de gran relevancia y trascendencia a nivel internacional (De la Paz, 2007; Fidalgo, Torrance, Rijlaarsdam, Van den Bergh, & Álvarez, 2015; Graham & Perin, 2007; Rijlaarsdam et al., 2008; Torrance, Fidalgo, & Robledo, 2015). Dicha aportación científica cobra especial relevancia si se considera que el carácter complejo y multicomponente de este tipo de instrucción tiene repercusiones negativas a nivel científico y educativo. En primer lugar, desde el punto de vista científico, dificulta conocer los mecanismos por los que la instrucción estratégica es efectiva para la mejora

de la competencia escrita del alumnado. Es decir, considerando la amplia gama de contenidos y componentes instruccionales incluidos generalmente en este tipo de instrucción y que sus efectos sobre la competencia escrita del alumnado son evaluados generalmente de manera global, no es posible conocer qué componentes y contenidos son realmente responsables de la mejora de la escritura del alumnado. Por otro lado, a nivel educativo, la implementación de este tipo de programas en el aula ordinaria es en general problemática. Esto se debe principalmente a que su aplicación en el aula demandaría en primer lugar, dedicar un tiempo considerable para su puesta en práctica, y en segundo lugar, formar al profesorado en las diferentes técnicas consideradas en este tipo de instrucción. Dichas dificultades podrían disminuir si se pudiese optimizar la compleja secuencia instruccional, para lo que es imprescindible un análisis pormenorizado de los efectos de los diferentes contenidos y componentes instruccionales generalmente incluidos en este tipo de instrucción. En este contexto, tras el diseño e implementación de dos estudios de carácter instruccional y uno de naturaleza descriptiva, los cuales contribuyen a está dimensión de la tesis doctoral, es posible presentar las siguientes **conclusiones generales**.

1º.- De manera general, la instrucción estratégica centrada en procesos de planificación y revisión textual resulta efectiva para la mejora de la competencia escrita del alumnado en los últimos cursos de Educación Primaria. Dicha efectividad se ha evidenciado en una mejora significativa de la calidad de los textos escritos por los estudiantes en términos de estructura, coherencia y calidad tras su participación en dichos programas. Así mismo, es importante considerar que dicha mejora significativa se obtuvo incluso frente grupos controles en los que no se siguió el currículum ordinario, como suele hacerse generalmente en este tipo de estudios, sino que se implementaron intervenciones que también han demostrado ser efectivas para la mejora de la escritura del alumnado como el análisis de tipologías textuales (Bouwer & Koster, 2016; Rietdijk, Janssen, Van Weijen, Van den Bergh, Rijlaarsdam, 2017). Igualmente, es necesario señalar que la notable mejoría de la competencia escrita del alumnado que fue entrenado en estrategias de planificación y revisión se constató incluso después de haber sido instruidos durante un breve periodo de tiempo de entre dos y cuatro sesiones de instrucción. Dicha conclusión es coherente con los resultados obtenidos en investigaciones previas, tanto a nivel general en relación a la efectividad de la instrucción estratégica para la mejora de la competencia escrita del alumnado de todas las edades

frente a otros enfoques instruccionales (Graham, 2006; Graham & Harris, 2018; Graham, McKeown, Kiuhara, & Harris, 2012; Koster, Tribushinina, De Jong, & Van den Bergh, 2015), como a nivel específico en relación a la necesidad e importancia de instruir al alumnado de últimos cursos de Educación Primaria en procesos alto nivel cognitivo como son la planificación y revisión textual para la escritura de textos de calidad (Graham & Harris, 2000; Harris, Santangelo, & Graham, 2010; Zimmerman & Risemberg, 1997).

2º.- Respecto al análisis componencial de la instrucción estratégica considerando sus componentes instruccionales, es posible concluir que tanto el modelado como la instrucción directa son técnicas igualmente efectivas para instruir al alumnado de últimos cursos de Educación Primaria en procesos de alto nivel cognitivo, como son la planificación y revisión textual, lo que revierte en un incremento de la calidad textual de sus composiciones tal y como se ha evidenciado en los dos estudios instruccionales implementados en la presente tesis doctoral. Es decir, en base a los resultados obtenidos podría concluirse que los estudiantes, al menos en estas edades, no necesitan ser instruidos de forma explícita en estrategias de planificación y revisión textual a través del uso de reglas nemotécnicas sino que cuentan con las habilidades cognitivas necesarias para poder inferir el conocimiento necesario a través del aprendizaje por observación tal y como se ha corroborado en investigaciones previas (e.g., Fidalgo et al., 2015). Es importante considerar que esta conclusión parece ser especialmente sólida, ya que la comparación directa de ambos componentes instruccionales en el primer estudio instruccional, puso de manifiesto que dichas técnicas son igualmente efectivas con independencia del tipo de tarea de evaluación implementada, escritura por parejas y escritura individual, o el nivel de competencia escrita del alumnado considerando las puntuaciones obtenidas por los estudiantes en el pre-test. Dicha conclusión por tanto complementaría los resultados encontrados en investigaciones previas sobre la efectividad de ambos componentes, determinando que al menos en alumnado de últimos cursos de Educación primaria sin dificultades de aprendizaje ambas técnicas son igualmente efectivas para la mejora de su competencia escrita.

3º.- En cuanto a los contenidos típicamente incluidos dentro de la instrucción estratégica los resultados obtenidos en la presente tesis permiten concluir que la instrucción en estrategias de planificación es efectiva para la mejora de la competencia escrita del alumnado al final de la etapa de Educación Primaria. Dicho resultado es coherente con lo encontrado en investigaciones previas (Graham et al., 2012; Graham &

Perin, 2007; Sadler, Moran, Graham, & Harris, 2017). De hecho, estudios previos han evidenciado que incluso en alumnado de muy corta edad (6 años), en el que se espera que los procesos de bajo nivel cognitivo supongan un gran coste cognitivo que les impida usar de forma efectiva procesos de alto nivel cognitivo, la instrucción en planificación ha resultado ser efectiva (Arrimada, Torrance, & Fidalgo, 2018). Sin embargo, una conclusión especialmente relevante en este sentido, cubriendo una laguna de conocimiento existente desde nuestro conocimiento en el ámbito de instrucción en escritura, es que instruir al alumnado en procesos de revisión textual supone una mejora adicional no solo de la calidad textual de las composiciones del alumnado sino en sus habilidades de revisión frente a la instrucción exclusiva en procesos de planificación relacionados con el establecimiento de objetivos comunicativos, lo cual ha demostrado ser de gran efectividad para la mejora de la competencia escrita del alumnado no solo en relación con la calidad textual (Koster et al., 2015) sino también para la mejora de las habilidades de revisión (MacArthur, 2012; 2016). Dicha conclusión parece ser especialmente relevante, dado que aporta información sobre los efectos positivos de instruir al alumnado en ambos procesos, algo que se había cuestionado en investigaciones previas por cuestiones evolutivas y motivacionales (Berninger & Swanson, 1994; Fidalgo, 2005; Torrance, Fidalgo, & García, 2007).

4º.- Por su parte, de nuevo en relación al contenido instruccional, es posible concluir que la instrucción en procesos de revisión es igualmente efectiva tanto a través de la instrucción explícita de estrategias de revisión apoyadas en el uso de reglas nemotécnicas como a través del fomento de la conciencia de la audiencia, al menos en la población de referencia analizada. Es necesario señalar que ambos enfoques mostraron ser efectivos tanto para la mejora de la calidad del producto textual de los estudiantes como para la mejora de sus habilidades de revisión en relación a la detección y corrección de errores sustantivos. Esto es especialmente relevante, siendo este tipo de revisiones sustantivas las que han demostrado relacionarse con la escritura de textos de mayor calidad (Limpo et al., 2014; MacArthur, 2018). Igualmente, dichos efectos parecen ser especialmente solidos dado que la mejora de la competencia escrita del alumnado se mantuvo dos meses después de la finalización de la intervención, así como se transfirió a un género textual no trabajado durante la instrucción. Dichos resultados son coherentes con lo encontrado en investigaciones previas en los que se evalúo la efectividad de ambos enfoques de forma independiente (Graham & Harris, 2018; Pritchard & Honeycutt,

2006), sin embargo aporta información nueva dado que no existen estudios previos, desde nuestro conocimiento, que hayan explorado el efecto de ambos contenidos de forma comparativa al mismo tiempo que es el primer estudio que instruye al alumnado de estas edades siguiendo el enfoque instruccional centrado en el fomento de la audiencia para la mejora de su competencia escrita (para revisión ver Rijlaarsdam et al., 2008). Así, los resultados encontrados en el presente estudio pondrían de manifiesto que no es necesario instruir al alumnado en estrategias explícitas del proceso de revisión a través del uso de reglas nemotécnicas, si no que a través del modelado implementado por un lector durante la lectura de textos imperfectos el alumnado es capaz de inferir el conocimiento necesario relacionado con el proceso de revisión que le permita no sólo mejorar su competencia escrita si no sus habilidades de revisión, al menos como se señaló anteriormente en el alumnado objeto de estudio de la presente tesis doctoral.

5º.- Por último, parece pertinente concluir que la utilización de un sistema de reporte de intervenciones en escritura que permita el análisis y comparación de las mismas de forma exhaustiva en relación tanto al contenido de la intervención como a su diseño instruccional, no solo resulta relevante desde el punto de vista de la difusión de la investigación, por las repercusiones científicas y educativas que se han señalado en capítulos anteriores, sino que también podría ser utilizado durante el complejo proceso de diseño de las intervenciones. En este sentido, la utilización de dicho sistema de reporte podría ayudar a los investigadores a la hora de seguir un estándar en el que tuviesen que definir y justificar de forma específica, tanto a nivel teórico como empírico, la selección de los diferentes contenidos incluidos en la intervención y su objetivo, así como el diseño instruccional implementado para alcanzar su logro. Dicho análisis pormenorizado de las intervenciones en la fase de diseño podría proporcionar información clave sobre posibles errores o lagunas en su fundamentación y/o diseño, lo que resultaría fundamental para evaluar la validez de las intervenciones de escritura de forma previa a su implementación con los estudiantes. Este sería, por tanto, un proceso similar al análisis de la validez y fiabilidad de los instrumentos de evaluación de las variables dependientes considerados en las investigaciones, el cual resulta crucial en el diseño de las mismas. Análisis sin embargo generalmente olvidado cuando se trata de la variable independiente, pese a ser crucial con el fin de asegurar la validez de la intervención.

Una vez presentadas las conclusiones generales extraídas en esta dimensión de estudio, se exponen a continuación las **aportaciones** derivadas del mismo.

1º.- Se ha validado empíricamente la efectividad de dos programas instruccionales centrados en el dominio estratégico y autorregulado de los procesos de alto nivel cognitivo de la escritura como son la planificación y revisión textual para la mejora de la competencia escrita del alumnado de los últimos cursos de la etapa de Educación Primaria, siendo éstos susceptibles de aplicarse de forma contextualizada en el grupo clase por el profesorado de esta etapa. Es importante considerar, que concretamente en el segundo estudio instruccional se pudo comprobar que este tipo de instrucción tiene implicaciones directas sobre las habilidades de revisión de los estudiantes en estas edades. Este aspecto es especialmente relevante dado que como se pudo concluir en el primer estudio de la tesis doctoral (p. 97), los estudiantes de últimos cursos de Educación Primaria muestran serias dificultades en el uso de este tipo de procesos. En este sentido, la aportación al ámbito educativo es clara, dado que es fundamental contar con prácticas instruccionales cuya efectividad haya sido contrastada a nivel empírico para la mejora de un área deficitaria en nuestro alumnado como es la competencia escrita, tal y como han puesto de manifiesto diferentes informes elaborados a nivel nacional (Ministerio de Educación, 2010; 2011).

2º.- El análisis de los efectos de los diferentes componentes instruccionales incluidos típicamente en la instrucción estratégica, en este caso en relación a las técnicas instruccionales de instrucción directa y modelado consideradas en la presente tesis, es clave a la hora de facilitar la transferencia de este enfoque instruccional al ámbito educativo, aspecto fundamental dada su alta efectividad para la mejora de la competencia escrita del alumnado. En este sentido, es necesario considerar que para los docentes la implementación de forma global de un programa de carácter estratégico en su práctica docente puede ser difícil. Esto puede deberse por una parte a la rígida programación curricular establecida en los centros educativos a la que deben adaptarse los docentes, y por otra parte, a la necesidad de formar y asesorar al profesorado para que cuente con los conocimientos y habilidades necesarias para su aplicación efectiva en el aula. Por este motivo, proporcionar información específica sobre la eficacia que por sí mismas tienen determinadas técnicas instruccionales, como el modelado o la instrucción directa de estrategias, puede facilitar la aplicabilidad de este tipo de programas en los centros educativos, así como hacer más sencilla su implementación en el aula para los docentes.

3º.- Por su parte, el análisis componencial de la instrucción estratégica en relación a los procesos de planificación y revisión textual, supone una aportación al ámbito

educativo ya que pone de manifiesto la mayor pertinencia de instruir al alumnado en los últimos cursos de Educación Primaria de forma comprehensiva en ambos procesos; lo que asegurará una mayor eficacia de los programas instruccionales de cara a la mejora de la competencia escrita del alumnado en estas edades.

Por otro lado, las conclusiones ofrecidas también tienen aportaciones significativas a nivel científico.

4º.- En relación al sistema de reporte de intervenciones en escritura que se ha diseñado y ejemplificado, su aportación a nivel científico está vinculada a dos fases del método científico: en la de diseño, como herramienta clave para facilitar el diseño ajustado del programa instruccional pretendido y análisis de su validez, de acuerdo con las variables de estudio y los objetivos planteados en la investigación; y en la fase de difusión de resultados, de cara a su utilización en publicaciones científicas, lo que significativamente influiría en el avance del conocimiento científico en torno a las teorías sobre el desarrollo de la competencia escrita y la psicología de la instrucción; tal como se ha discutido en anteriores capítulos de la tesis (capítulo 6, p. 175).

5º.- Por su parte, a nivel científico se puede concluir que en relación al análisis componencial de la instrucción estratégica y autorregulada no parece necesario instruir al alumnado en estrategias de planificación y revisión de forma explícita a través de la instrucción directa apoyada en el uso de reglas nemotécnicas. En este sentido, al menos en alumnado de últimos cursos de Educación Primaria sin dificultades de aprendizaje, el alumnado parece ser capaz de inferir a través del aprendizaje por observación aquellos conocimientos necesarios o clave en la escritura los cuales revierten en una mayor calidad textual de sus composiciones escritas, tal y como han demostrado estudios previos (Braaksma et al., 2004; Rijlaarsdam et al., 2008).

Por último, como en toda investigación, también aquí es necesario hacer alusión a ciertas **limitaciones o lagunas presentes en esta investigación**, que a su vez abren **futuras líneas de investigación** a seguir.

1º.- Una de las mayores lagunas encontradas en el presente trabajo y compartida por ambos estudios de carácter instruccional es que los efectos de la intervención fueron analizados de forma parcial, ya que tan sólo se tuvo en cuenta el análisis de sus efectos a nivel del producto textual. Este hecho supone una importante limitación ya que uno de

los objetivos de la instrucción estratégica es favorecer que el alumnado adquiera un proceso de escritura auto-regulado (Graham & Harris, 2018). Por ello, parece necesario que futuras investigaciones exploren los efectos que este tipo de instrucción, de manera global, así como sus componentes de manera específica tienen en el proceso de escritura de los estudiantes a través del uso de medidas online. De hecho, en el contexto de la investigación incluida en la presente tesis, dicho aspecto parece aún más necesario. Analizar el proceso de escritura podría aportar información sobre los efectos diferenciales que la instrucción directa o el modelado pueden tener sobre el proceso de escritura de los estudiantes. Exactamente de la misma manera se podría obtener información valiosa sobre los contenidos instruccionales, analizando los cambios específicos en la planificación y en la revisión textual, y su influencia en el logro de la calidad textual. En esta misma línea, y con la finalidad de obtener información complementaria que permitiese obtener una visión comprehensiva de los efectos de los diferentes componentes y contenidos instruccionales, también habría sido pertinente realizar una evaluación comprehensiva de otras variables que pueden haber variado como fruto de la intervención, como: las estrategias de escritura del alumnado, su conocimiento metacognitivo o su motivación, entre otros. En este sentido, en línea con el análisis pormenorizado de los objetivos de aprendizaje intermedios (intermediate learning objectives) que se presenta en el sistema de reporte propuesto en esta tesis doctoral, habría sido interesante contar con medidas intermedias del logro de estos objetivos intermedios. Esto proporcionaría información clave sobre los cambios que subyacen a la instrucción en diferentes componentes de la instrucción estratégica y a su vez a la vinculación entre el diseño instruccional y el aprendizaje logrado por el alumnado, todo ello clave para el avance del conocimiento científico, tanto en el ámbito instruccional y como en el de la composición escrita.

2º.- Es necesario tener en cuenta que ambos estudios instruccionales se han dirigido a estudiantes de desarrollo normalizado, pertenecientes a los dos últimos cursos de la etapa de Educación Primaria. En este sentido, los resultados obtenidos podrían variar considerablemente con otro tipo de alumnado. Así, con el fin de poder generalizar los resultados obtenidos, sería interesante el planteamiento de nuevas investigaciones que explorasen la efectividad de diferentes componentes de la instrucción estratégica en otro tipo de poblaciones, como por ejemplo, alumnado con dificultades de aprendizaje, alumnado de menor edad, etc. Conocer los efectos de los diferentes contenidos y

componentes instruccionales en diferentes poblaciones aportaría información de gran utilidad a nivel educativo que permitiría proporcionar al alumnado una instrucción lo más ajustada a sus necesidades, y también a nivel científico, por su aportación a nivel de teorías del desarrollo de la competencia escrita.

3º.- En ambos estudios instruccionales las intervenciones fueron implementadas por los investigadores y no por el profesorado que normalmente imparte clase en la asignatura de Lengua Castellana y Literatura, asignatura en la que se considera de forma explícita la enseñanza de la escritura. Si bien esto no limita las conclusiones del estudio, si limita la transferencia del conocimiento del ámbito científico al educativo. Si no se involucra al profesorado en los estudios instruccionales difícilmente podremos esperar que éstos apliquen este tipo de instrucción en su aula ordinaria una vez finalizada la intervención. Por ello, futuras investigaciones deberían considerar hacer partícipe al profesorado en los estudios instruccionales de manera significativa, proporcionándoles la oportunidad de participar en programas de desarrollo profesional en torno al dominio de prácticas basadas en la evidencia para la mejora de la competencia escrita, como la instrucción estratégica, que les permitan utilizar dichas prácticas de manera efectiva y autónoma en sus aulas ordinarias; línea de investigación en torno a la cual se está trabajando.

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