Universidade do Minho
Escola de Psicologia

Julia Helene Högemann

Promoção de Competências de Autorregulação na Escrita: um estudo com alunos do 4.º ano do Ensino Básico

outubro de 2015

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Tese de Doutoramento em Psicologia Aplicada

Trabalho efetuado sob orientação do
Professor Doutor Pedro Sales Luís da Fonseca Rosário

outubro de 2015

DECLARAÇÃO DE INTEGRIDADE

Declaro ter atuado com integridade na elaboração da presente tese. Confirmo que em todo o trabalho conducente à sua elaboração não recorri à prática de plágio ou a qualquer forma de falsificação de resultados.

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Universidade do Minho, 30 de Outubro de 2015

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PROMOÇÃO DE COMPETÊNCIAS DE AUTORREGULAÇÃO NA ESCRITA: UM ESTUDO COM ALUNOS DO 4.º ANO DO ENSINO BÁSICO

RESUMO

A escrita de composições consiste numa atividade extremamente complexa que exige dos alunos não só conhecimentos acerca do texto, do assunto a escrever, como também de estratégias a utilizar durante o planeamento, escrita e revisão do texto. Segundo dados nacionais e internacionais, grande parte dos alunos manifestam severas dificuldades nesta atividade, tendo repercussões negativas ao longo de todo seu percurso escolar e vida adulta. Por este motivo, nas últimas décadas, têm sido efetuadas reformas para o ensino da escrita, contudo, as dificuldades face à mesma subsistem, sendo superiores à leitura e à matemática. Dado o cenário apresentado, que reúne preocupações diversas, urge a necessidade de desenhar programas com diferentes graus de intervenção para responder ao variado leque de necessidades educativas de acordo com os recursos existentes. De modo a responder às lacunas identificadas, a presente tese encontra-se estruturada em quatro capítulos correspondentes a quatro trabalhos científicos.

No primeiro capítulo salienta-se (i) o papel da autorregulação da aprendizagem no ensino das estratégias de escrita para a melhoria da qualidade da escrita; (ii) a utilização das estórias como eficazes ferramentas promotoras de competências de autorregulação da aprendizagem; e (iii) o contributo das estórias na promoção de competências de autorregulação na escrita. Este trabalho, aceite para publicação num capítulo de um livro internacional sintetiza todo o corpo teórico que sustenta os estudos empíricos incluídos na presente tese.

O segundo capítulo providencia um manual prático dirigido a professores do 1.º ciclo do Ensino Básico sobre um programa de promoção de competências de autorregulação na escrita de composições que combina um modelo de intervenção na escrita empiricamente validado e uma estória-ferramenta. Este capítulo, que correspondeu a um convite dos investigadores do *SIG* (i.e., Special Interested Group) de escrita da EARLI será publicado oportunamente num *e-book*. Este descreve todas as sessões do programa, fornecendo estratégias e materiais para melhorar a qualidade da escrita de composições.

No terceiro capítulo é apresentado o primeiro estudo empírico desta tese (submetido a uma revista científica internacional) que avalia o impacto da utilização de atividades livres de escrita (i.e.,

escrever um *journal* sobre as experiências vividas durante semana) na melhoria da qualidade da escrita de composições ao longo de 12 semanas. Este estudo é de grande relevância educacional e social, uma vez que revela que escrever *journals* semanalmente, contribui significativamente para a melhoria da qualidade da escrita de composições de alunos do 4.º ano de escolaridade num reduzido período de tempo. O estudo revela ainda que as melhorias são tanto maiores quanto melhor for a qualidade dos *journals* escritos pelos alunos. Contudo, esta atividade de escrita apresenta um efeito de teto após três semanas de utilização. Apesar dos resultados serem promissores, continua a haver necessidade de intervir sobre as dificuldades de escrita dos alunos, passando para campos de ação que envolvam programas especializados na promoção de competências de escrita e autorregulação da aprendizagem.

O último capítulo apresenta um segundo estudo empírico, submetido a uma revista científica internacional, que procurou avaliar, ao longo de 12 semanas, o impacto de três intervenções promotoras da qualidade da escrita de composições com grau crescente de especialização destinadas a alunos do 4.º ano de escolaridade (i.e., escrita de *journals* semanais; programa de intervenção na escrita empiricamente validado; programa de intervenção na escrita empiricamente validado combinado com uma estória-ferramenta promotora de competências de autorregulação da aprendizagem). Os dados revelam que a melhoria da qualidade da escrita de composições aumenta tanto quanto maior é o grau de especialização da intervenção implementada. Contudo, as diferenças entre os alunos que participaram no programa de intervenção na escrita empiricamente validado e os alunos que participaram no programa de intervenção combinado não são estatisticamente significativas. Apesar de não se verificar uma melhoria significativamente superior nos alunos que participaram no programa combinado, os relatos dos professores e a experiência no terreno indicam que a utilização da estória-ferramenta facilitou o envolvimento dos alunos na aprendizagem das estratégias de escrita. No futuro são necessários mais estudos que aprofundem o conhecimento sobre o processo de autorregulação na escrita, por exemplo, combinando metodologias quantitativas e qualitativas de investigação. Os trabalhos desenvolvidos permitem concluir que é possível melhorar a qualidade da escrita de composições em diferentes níveis de atuação consoante as necessidades e recursos existentes, através, por exemplo, de uma lógica de *Response to Intervention* (RTI).

Palavras-Chave: Autorregulação da Aprendizagem, Escrita de Composições, *Week-Journals*, *Self-Regulated Strategy Development*, Estórias

IMPROVING SELF-REGULATION PROCEDURES IN WRITING: A STUDY WITH 4TH-GRADE STUDENTS IN THE ELEMENTARY SCHOOL

ABSTRACT

Writing compositions is an activity extremely complex that requires from students, not only, knowledge about text and the topic, but also about the strategies regarding planning, writing and revision of the text.

According to national and international data, a great number of students demonstrate to have severe difficulties in this activity, leading to negative repercussions throughout schooling and adult life. For this reason, in the last decades, reforms have been made in the field of the teaching of writing. However these writing difficulties tend to subsist, being higher than in reading or in mathematics. Given the scenario presented, which brings together several concerns, there is an urgent need to design programs with different levels of intervention in order to address the wide range of educational needs according to the existing resources.

In order to meet the identified gaps, the current doctoral thesis presents four chapters corresponding to four accepted and submitted scientific works.

The first chapter covers: (i) the role of self-regulated learning in the teaching of writing strategies to enhance writing quality; (ii) the usage of stories as effective tools to promote self-regulation skills; and (iii) the contribution of stories to the promotion of self-regulation in writing. This work, accepted for publication in an international book chapter, synthetizes the theoretical background that supports the empirical studies included in the current thesis.

The second chapter provides a practical guide, targeted to elementary school teachers, that is based on a program to promote self-regulation in writing compositions that combines an evidence-based writing intervention model with a story-tool. This chapter, results from an invitation of researchers of SIG (i.e., Special Interested Group) Writing of EARLI, which will be published in the form of an e-book. It describes all the sessions of the program and provides strategies and materials to enhance the writing quality of compositions.

The third chapter corresponds to the first empirical study of this thesis, which has been recently submitted for peer-review in an international scientific journal. This research assessed the

impact of a free writing activity (i.e., writing a journal on the real-life experiences of the week) on writing quality of compositions for 12 weeks. This study has important educational and social relevance, showing that writing week-journals significantly contributes to fourth graders' writing quality of compositions in a short period of time. This study has also found that the improvements in writing quality increase with the quality of the journals written by students. Nevertheless this writing activity has a ceiling effect after three weeks of intervention. Despite of the promising results, there remains a need to intervene on the students' writing difficulties, moving to areas of action that involves specialized programs to promote writing and self-regulated learning skills.

The last chapter presents the second empirical study of this thesis, which has been recently submitted for peer-review in an international scientific journal, that examined, for 12 weeks, the impact of three interventions with increasing levels of specialization aiming to promote the writing quality of compositions of fourth graders (i.e., week-journals, evidence-based writing intervention model, and evidence-based writing intervention model combined with a story-tool as a promoter of self-regulated learning). Data showed that students' writing quality is higher for students enrolling in a treatment condition with a high degree of specialization. Notwithstanding, the differences found between students who participated in the evidence-based writing intervention and the students who participated in the combined intervention program were not statistically significant. Despite the writing quality is not significantly higher for students who participated in the combined intervention program, teachers' reports and the experience from the research field indicated that the usage of the story-tool facilitated students' engagement during the learning of writing strategies. Further research is needed to deepen the knowledge concerning the process of self-regulation in writing using, for example, quantitative and qualitative research methods.

The developed works allowed concluding that it is possible to improve students' writing quality of compositions using different levels of action according to extant needs and resources through a logic of Response to Intervention (RTI).

Keywords: Self-Regulation in Learning, Writing Compositions, Week-Journals, Self-Regulated Strategy Development, Story-tools

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1. INTRODUÇÃO

A escrita é uma ferramenta poderosa e fundamental ao aluno, não apenas para a aprendizagem de conteúdos académicos, mas igualmente para a promoção da partilha de conhecimentos (Graham, 2006), experiências, ideias e pensamentos (Kim, Otaiba, & Wanzek, 2015).

As últimas três décadas têm sido caracterizadas por uma preocupação crescente à escala mundial (Applebee & Langer, 2011), e com particular incidência em Portugal, sobre a qualidade no ensino da escrita e no desenvolvimento de novas reformas educativas com o intuito de prevenir o insucesso escolar, promover competências capazes de melhorar a qualidade da escrita (e.g., gramática, construção frásica, organização do texto) e equipar os docentes com ferramentas mais eficazes (Applebee & Langer, 2011; Harris, Graham, & Adkins, 2015; OCDE, 2013). De acordo com resultados académicos recolhidos pelo Ministério da Educação e Ciência (2013), os alunos Portugueses do 4.º ano de escolaridade têm vindo, continuamente, a evidenciar maiores dificuldades na escrita, em comparação com a matemática ou a leitura. A falta de intervenção cirúrgica nestas idades poderá ter consequências ainda mais alarmantes, dado que as dificuldades na escrita se tendem a arrastar até ao ensino superior, tal como referido por Carvalho e Pimenta (2005).

De facto, apesar dos esforços já realizados, a escrita é ainda hoje um motivo de grande preocupação e dificuldade para muitos alunos (Graham, Harris, & Santangelo, 2015), uma vez que exige do aluno: (i) elevados níveis de autorregulação e atenção; (ii) conhecimento sobre o tópico apresentado, do tipo de texto pedido e dos processos e competências envolvidos na escrita (Zimmerman & Riesemberg, 1997); (iii) conhecimento sobre estratégias a usar durante a planificação e escrita do texto (Fitzgerald, 2013; Harris & Graham, 2009); (iv) conhecimento sobre estratégias a usar na monitorização da atividade (Scardemalia & Bereiter, 1986); (v) e, por fim, alcançar os objetivos previamente estabelecidos (Alexander, Graham, & Harris, 1998). Assim, nas últimas décadas, vários autores têm aclamado a importância de treinar estratégias de autorregulação na escrita a fim de promover a qualidade das composições dos alunos (e.g., Graham et al., 2015; Hillocks, 1986).

1.1 O papel da autorregulação na escrita

De acordo com o modelo desenvolvido por Flower e Hayes (1981) a escrita é entendida "como um conjunto de processos mentais, hierarquicamente organizados, controlados pelo sujeito que escreve através da definição e redefinição constante de objetivos de natureza mais geral ou mais concreta" (Carvalho, 2001, p. 144), envolvendo três elementos principais: o ambiente educativo, a memória a longo prazo (i.e., conhecimento sobre o tópico, o tipo de texto pedido e o destinatário) e, por fim, o processo de escrita (i.e., planificação, redação e revisão). Na fase de planificação, o aluno cria e elabora um plano com as ideias a escrever na fase de redação e estabelece objetivos à priori. De seguida, ao redigir o texto, o aluno transforma as ideias em frases e parágrafos, estabelecendo relações de coesão linguística e coerência lógica entre elas. Por fim, na fase de revisão, o aluno avalia e reflete sobre o texto criado, analisando-o segundo os objetivos inicialmente traçados e reformulando-o caso necessário. Todos estes processos, exigem do aluno uma elevada atividade metacognitiva, desempenhando a autorregulação um papel crucial para a conclusão do mesmo (Harris, Schmidt, & Graham, 1997). Por outras palavras, os alunos devem ter conhecimento de uma panóplia de estratégias a usar antes (e.g., identificar e caracterizar as personagens), durante (e.g., escrever o texto baseando-se no rascunho) e após a escrita (e.g., verificar se todas as ideias incluídas no rascunho estão no texto) (Graham & Harris, 2000; Zimmerman, 2013).

A literatura é unânime ao considerar a escolha e o controlo como características fundadoras da autorregulação, responsabilizando o aluno pelo seu processo de aprender. Um professor distingue facilmente um aluno autorregulador da sua aprendizagem, de outro que não o é (Zimmerman, 1994). Um aluno autorregulador atribui normalmente os seus resultados a factores que são do seu controlo, como o seu esforço e envolvimento pessoal na tarefa, mencionando que a competência é fundamental, pelo que investe no sentido de a muscular e fortalecer (Zimmerman, 2000). Como resultado, são escassos os casos em que os alunos mais autorreguladores não apresentem resultados proficientes (Rosário et al., 2010). No entanto, o grau de escolha que cada aluno utiliza para regular as dimensões da sua aprendizagem, como o comportamento e o ambiente educativo, implica conjugar o saber "*skill*" e o querer "*will*" (Schunk & Zimmerman, 2008) que caminham lado a lado para o "*aprender*" (Rosário et al., 2006).

Reconhecendo o papel fundamental que a autorregulação exerce no sucesso escolar dos alunos, a linha de investigação seguida ao longo dos últimos anos tem procurado dar suporte empírico

à presunção de que os alunos devem participar em atividades que promovam a aprendizagem de estratégias autorregulatórias (Perry et al., 2004) e de competências de escrita nos primeiros anos de escolaridade (Graham & Harris, 2005). É nesta fase crucial do processo de aprendizagem, que os alunos tendem a desenvolver atitudes positivas face à aprendizagem e de autoeficácia (Whitebread, 2000). Por outro lado, a intervenção nos primeiros anos de escolaridade possibilita uma atuação mais eficaz e moldada às necessidades dos alunos, dado que estes não adquiriram ainda estilos próprios de aprendizagem (Hattie, Biggs, & Purdie, 1996; Dignath, Buettner, & Langfeldt, 2008). Vários autores têm igualmente demonstrado que é importante providenciar nestas idades e em sala de aula diferentes atividades de escrita que promovam o envolvimento do aluno, a sua motivação (Applebee, 2000; Braddock & Jones, 1969; Lo & Hyland, 2007) e uma atitude positiva face à mesma (Boscolo, 2008a).

1.2 Objetivos do presente trabalho

A escrita assume-se como uma ferramenta imprescindível ao desenvolvimento académico, profissional e pessoal do aluno, no entanto estima-se que cerca de 2/3 apresenta diversas dificuldades nesta tarefa cognitivamente exigente (Graham & Harris, 2000; Graham et al., 2015; National Center for Education Statistics, 2012; Zimmerman & Risenberg, 1997). No contexto português, segundo o Ministério de Educação e Ciência, no ano de 2013, a média nacional do exame de português rondava os 49%, sendo esta percentagem alvo de grande preocupação por parte dos agentes educativos. Inclusivamente, os professores que contactamos no terreno referiram que a escrita de composições era das tarefas mais difíceis para os alunos concretizarem e de os próprios professores ensinarem. Tendo por base esta problemática de grande relevância internacional e nacional, o presente trabalho nasceu com o intuito de responder aos seguintes objetivos:

Objetivo 1: Apresentação dos conceitos e modelos associados ao *guarda-chuva* teórico da autorregulação da aprendizagem assim como do benefício da utilização de estórias empiricamente validadas que procuram equipar os alunos com um conjunto de estratégias de autorregulação a usar no contexto educativo e na vida diária.

Objetivo 2: Desenvolvimento de um manual prático sobre o programa de promoção de competências de autorregulação na escrita de composições, baseado na combinação do modelo *Self-Regulated*

Strategy Development (SRSD) (Harris & Graham, 1996) com a estória *Sarilhos do Amarelo* (Rosário, Núñez, & González-Pienda, 2007).

Objetivo 3: Avaliação da eficácia da promoção de atividades extracurriculares de escrita (i.e., escrever um *jornal*/ reflexão) na melhoria da qualidade da escrita de composições.

Objetivo 4: Desenvolvimento e avaliação de um programa de promoção de competências de autorregulação na escrita de composições, que consiste na combinação do programa *Self-Regulated Strategy Development (SRSD)* desenvolvido por Harris e Graham (1996) com a estória *Sarilhos do Amarelo* desenvolvido por Rosário et al. (2007).

Objetivo 5: Avaliação da eficácia de três intervenções de promoção de competências de autorregulação na escrita (i.e., escrita de um *journal*/ reflexão, SRSD, SRSD juntamente com Sarilhos do Amarelo) em simultâneo.

1.3 Organização da tese

A presente tese encontra-se estruturada em três partes fundamentais. Na primeira parte, introduz-se de forma breve o racional teórico que sustenta os objetivos estabelecidos para esta tese e a sua estrutura; na segunda parte, são apresentados os quatro capítulos que constituem a pesquisa bibliográfica e a investigação empírica desenvolvida; e, por fim, na terceira parte, encerra-se este trabalho com as conclusões gerais integradoras dos resultados obtidos nos estudos empíricos e possíveis implicações para a prática educativa e investigação futura. Uma breve descrição dos quatro capítulos da tese é feita de seguida.

O capítulo 1 apresenta a fundamentação teórica dos conceitos e modelos associados à autorregulação e estratégias de aprendizagem. Neste capítulo, são explorados, igualmente, de forma aprofundada três programas desenhados para alunos desde o 1.º Ciclo ao Ensino Superior. Estes têm como objetivo promover competências de autorregulação da aprendizagem através da leitura de um conjunto de estórias. O estilo narrativo destas ferramentas confere-lhes um caráter dinâmico, onde os alunos têm a oportunidade de aprender um vasto leque de estratégias de aprendizagem, de refletir

sobre situações vivenciadas pelas personagens, que por sua vez, apresentam-se como sendo muito próximo das suas, transferindo-as assim para outros momentos de aprendizagem (e.g., escrita de composições) e/ou outros contextos de vida. A estória escolhida para o desenvolvimento desta investigação junto de alunos 1.º Ciclo, intitula-se "*Sarilhos do Amarelo*" de Rosário et al. (2007).

O Capítulo 2 foca-se na descrição passo-a-passo do programa de promoção de competências de autorregulação na escrita de composições desenvolvido neste trabalho. Este programa pretende dotar os alunos com competências de autorregulação e estratégias de aprendizagem mais eficazes para a escrita de composições e baseia-se na combinação do modelo *"Self-Regulated Strategy Development (SRSD)"* de Graham e Harris (1996), o qual promove estratégias de escrita e autorregulação, e da ferramenta *"Sarilhos do Amarelo"* desenvolvido por Rosário et al. (2007), a qual se destina a equipar os alunos com um conjunto de estratégias autorregulatórias.

O capítulo 3 pretende analisar a eficácia da escrita de *week-journals* na promoção da qualidade de composições. Sendo a escrita uma ferramenta imprescindível no dia-a-dia e no processo de aprendizagem de conteúdos, procurou-se perceber se a escrita de um *journal* semanal (i.e., breve reflexão ou "diário" sobre a semana do aluno na escola) promove a qualidade da escrita de composições. Este estudo apresenta um desenho quase-experimental, de medidas repetidas ao longo de 12 semanas.

Por fim, o capítulo 4 pretende analisar a eficácia das três intervenções acima citadas na melhoria da aquisição das competências de autorregulação, autoeficácia e atitude face à escrita, e qualidade das composições.

1.4 Publicações

Capítulo 2. Rosário, P., Núñez, J. C., Rodríguez, C., Cerezo, R., Fernández, E., Tuero, E., & Högemann, J. (in press). Analysis of instructional programs for improving self-regulated learning SRL through written text. In R. Fidalgo, K. Harris, & M. Braaksma (Eds.), *Design principles for teaching effective writing* (pp. 1-37). Leiden: Brill Editions.

Capítulo 3. Högemann, J., Rosário, P., Núñez, J. C., Rodríguez, C., & Valle, A. (in press). Promoting self-regulatory skills in writing using a story-toll. In R. Fidalgo, K. Harris, & M. Braaksma (Eds.), *E-book: Design principles for teaching effective writing*. Leiden: Brill Editions.

Capítulo 4. Rosário, P., Högemann, J., Nuñez, J. C., & Vallejo, G., Cunha, J., & Oliveira, V. (submitted). Writing week-journals to improve the writing quality of fourth-graders' compositions. *Journal of Educational Psychology*.

Capítulo 5. Rosário, P., Högemann, J., Núñez, J. C., Vallejo, G., Cunha, J., & Fuentes, S. (submitted). The impact of three types of writing intervention on fourth-grade students' writing quality. *Contemporary Educational Psychology*.

2. ANALYSIS OF INSTRUCTIONAL PROGRAMS FOR IMPROVING SELF-REGULATED LEARNING THOUGH WRITTEN TEXT

Rosário, P., Núñez, J. C., Rodríguez, C., Cerezo, R., Fernández, E., Tuero, E., & Högemann, J. (in press). Analysis of instructional programs for improving self-regulated learning SRL through written text. In R. Fidalgo, K. Harris & M. Braaksma (Eds.), *Design Principles for Teaching Effective Writing* (pp. 1-37). Leiden: Brill Editions.

2.1 Introduction

This chapter focuses on the role of self-regulated learning (SRL) in the learning process. The relevance of SRL is increasing in the literature, as research shows that students who receive training in SRL strategies (e.g., goal setting, time management, help seeking) engage more deeply in school tasks and show higher academic achievement (e.g., Dignath, Buettner, & Langfeldt, 2008; Rosário, González-Pienda et al., 2010; Zimmerman, 2002). When addressing writing, Graham, McKeown, Kiuhara and Harris (2012) report that adding SRL instruction to writing strategy instruction improved writing quality even in struggling writers. SRL strategies, such as planning and organizing writing, monitoring and goal-setting, proved to be highly effective for students (Graham & Harris, 2003), with particularly consistent positive effects on writing performance (Lane et al., 2010; Little, Lane, Harris, & Graham, 2010). Training in SRL strategies provides students with the cognitive and pragmatic tools necessary for writing success (Zumbrunn & Bruning, 2013).

This chapter presents three intervention programs for different educational levels with the same implementation method and theoretical background: a set of story–tools to promote SRL. The three intervention programs were designed for students from elementary to higher education: *Yellow trials and tribulations* (Rosário, Núñez, & González-Pienda, 2007a, 2007b) for elementary school; the collection named *Testas's (mis)adventures* (Rosário, 2002a, 2002b, 2002c; 2003; 2004a, 2004b) for 5th through 9th graders; and the program entitled *Letters from Gervase* (Rosário, Núñez, & González-Pienda, 2006) for 1st year College students. These programs aim at promoting SRL strategies through narratives. The stories are written in a friendly and casual discourse fostering students' metacognitive

reasoning while answering the questions and performing tasks proposed by the characters, and by analyzing similarities of the proposed narratives with their own experience.

In the first part of this chapter, the PLEE Model (Plan-Execution-Evaluation), which is the theoretical basis that supports the design of the intervention programs is discussed. The second part of the chapter presents a detailed analysis of each instructional program and their components (SRL story-tools programs). We describe and analyze the specific learning and teaching activities for each program, summarizing its features and explaining its rationale and purpose. To help readers understand how the theoretical concepts can be worked out in the educational settings, excerpts from the narratives and examples of the proposed tasks are also provided. Then, a brief synopsis of studies supporting the effectiveness of the programs, and the learning variables over which the programs show a positive impact are presented. Finally, we discuss some conclusions from these findings and draw suggestions for future research.

2.2 Theoretical and empirical framework of SRL

SRL research is an attempt to analyze how students proactively control learning, and manage their cognitive and motivational processes towards their self-set goals (Zimmerman, 2008). Previous research offers a robust corpus of empirical data indicating a strong relationship between SRL and academic success (e.g., Boekaerts & Corno, 2005; Liem, Lau, & Nie, 2008; Núñez et al., 2011; Rosário, Núñez et al., 2010; Zimmerman & Martínez-Pons, 1988), as well as with motivation for learning (Zimmerman & Schunk, 2011). Moreover, lacking self-regulation competences forecast future problems at school (Núñez, Rosário, Vallejo, & González-Pienda, 2013). Therefore, there is an educational call to equip students with knowledge and skills that will allow them to self-regulate their learning in different ways (Cleary & Zimmerman, 2004; Dignath et al., 2008; Rosário et al., 2014). In fact, during self-regulating learning students display cognitive and metacognitive processes to control their cognition, motivation, learning environments, and behaviors (Zimmerman & Schunk, 2011), before, during, and after learning (Greene, Hutchison, Costa, & Crompton, 2012; Rosário, Núñez, Valle, González-Pienda, & Lourenço, 2013). Thus, SRL could be defined as an active process whereby subjects establish the goals which direct their learning, monitoring, regulate, and control their cognitions, as well as their own motivations and behaviors, with the purpose of achieving their goals (Rosário et al., 2006; Zimmerman, 2002).

Learners who master SRL competencies focus on their agent role and assume that academic success depends mainly on their own behaviors (Bandura, 2001). In this sense, students activate, alter, and sustain learning strategies (LS) in context. These students are more prone to face learning as an activity which they develop proactively rather than reactively in response to teaching (Zimmerman, 2002; Zimmerman, Greenberg, & Weinstein, 1994).

According to Zimmerman (2000, 2002), SRL is an open and dynamic process proceeding through three main phases: the preceding phase (forethought), the performance or volitional control phase, and the self-reflection phase. These phases of the SRL processes interact dynamically and simultaneously with each other, and concurrently these processes are of a sequential nature (Pintrich, 2004). For this reason, these SRL processes are intrinsically cyclic and interdependent to such an extent that the forethought phase informs the volitional control phase, which in turn shapes the processes of the self-reflection phase. These self-reflection processes influence the subsequent phase, helping the learners with their learning process (Rosário, González-Pienda et al., 2010; Zimmerman, 2000; Zimmerman & Kisantas, 1997). Understanding the structure and functioning of this learning cycle is essential for establishing the role of the learner and the assumption of the responsibility inherent to the SRL process.

SRL literature suggests that students should learn a set of learning strategies which will allow them taking responsibility for and control of their learning process. This cyclical model explaining SRL (Zimmerman, 1998, 2000) is the foundation of the PLEE model (for a more detailed explanation see Figure 2.1 and Rosário, 2004a). Its recursive structure presents three phases: Planning, Execution, and Evaluation of tasks, through two paths of logic. The process not only proceeds from Planning through Execution to Evaluation, but the same cyclical nature is also reset at each phase, thus reinforcing the SRL logic of the process (see Figure 2.1). The PLEE model presents a sequence of the SRL processes in which each phase operates within itself the three phases of the cyclical process. Thus, the Planning phase, for example, should also be Planned, Executed and Evaluated, as illustrated in Figure 2.1. The two structuring loops of this intervention project reinforce the SRL synergy, allowing the self-regulation process to be experienced as a whole (Rosário, González-Pienda et al. 2010).

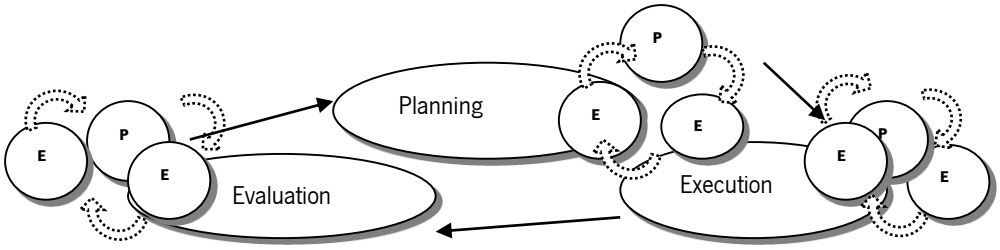

Figure 2.1. The PLEE model of SRL (Rosário et al., 2006)

The SRL process loop requires each task or activity to be planned, executed, and evaluated. Explicit teaching of these phases encourages children, young students, and educators alike to reflect about their agent role in the whole process.

Each phase of the SRL process summons a set of learning strategies (see Table 2.1) which reinforce the cyclical nature of the PLEE model (Rosário, 2004a; Rosário, Mourão, Trigo, Núñez, & González-Pienda, 2005). Zimmerman and Martinez-Pons (1990) presented data from high school students reported use of SRL strategies in two typical learning contexts: the classroom and the study time outside classroom. Fourteen types of SRL learning strategies were described in both investigations (see, Zimmerman & Martinez-Pons, 1988). These learning strategies, although diverse, share some communalities: (i) represent deliberate actions to attain specific goals, (ii) involve imagination and creativity in response to a specific task or problem, (iii) are used selectively and according to the task, and finally, (iv) need to be used in various tasks differing in nature and degree of difficulty, as a means to facilitate transference.

Table 2.1 presents an outline of learning strategies (Zimmerman & Martinez-Pons, 1986) reorganized according to the phases of the SRL process in PLEE.

Table 2.1 *Phases and strategies of the SRL process*

Phases of the SRL process		
Planning	Execution	Evaluation
Self-evaluation, Goal setting and planning, Environmental structuring, Seeking social assistance (peer, teacher and adult).	Note taking, Rehearsing and memorizing, Seeking information, Keeping records and monitoring.	Self-consequences, Reviewing records.

Now that we have presented the theoretical foundations that support the design of the intervention programs, we will discuss the general structure that underlies the three programs, detailing each of them separately.

2.3 SRL story-tools programs

The SRL story-tools programs project has been developed in Portugal, at the University of Minho, in collaboration with researchers from the University of Oviedo, in Spain. This line of research is focused on the promotion of SRL through different kinds of written texts. The programs are rooted in the conviction that all students are capable of learning and may, at will, take control of their motivation and learning. To build this SRL line of intervention, school teachers, lecturers, and investigators worked together, taking advantage of the synergy between theory and practice to generate teaching tools (Randi & Corno, 2000). Researchers have created a set of story–tools to promote SRL aimed at elementary school (*Yellow trials and tribulations*, Rosário et al., 2007b); at 5th through 9th graders (Collection *Testas's (mis)adventures*, Rosário, 2002a,2002b, 2002c; 2003; 2004a, 2004b); and at 1st year College students (*Letters from Gervase*, Rosário et al., 2006).

This section starts with an overview of the macrostructure of the intervention to focus on the description of the three intervention programs from the SRL story-tool project. In this section we address both the macro and microstructure, due to the special features of the SRL story-tools project. As aforementioned, the project is composed by three different programs suitable for different educational levels, following a general instructional sequence. Thus, the learning and discussing from texts, reading as well as training writing, are the major features underlying the three different intervention programs. Nevertheless, each proposal is designed to fit in the different students´ demands at different educational levels, as will be noted when addressing their microstructure.

2.3.1 General features of the SRL story-tools programs

This section provides a description of the written texts as the main instructional component of the SRL story-tools programs, as well as the basic instructional sequence used to teach the SRL strategies. SRL story-tools programs are designed to foster students ' SRL strategies, by supporting students to enhance declarative, procedural, and conditional knowledge of SRL strategies.

One of the SRL instruction's main goal is to help students to master three kinds of knowledge about learning strategies: declarative, procedural, and conditional (Núñez et al., 2013). Declarative knowledge of learning strategies is factual knowledge which involves information on a variety of learning strategies (e.g., know what taking notes is). The procedural knowledge of learning strategies is the knowledge of how to implement the learning strategies (e.g., know how to take notes in class). Finally, conditional knowledge is related to when one should use a learning strategy in a particular learning context (e.g., considering that taking notes could distract students from following the course of the class, being a distractor, students must decide when and how the use of this strategy may or may not be effective) (Alexander, 2006). Hands-on practice with a set of SRL strategies (see, Rosário, González-Pienda et al., 2010; Rosário et al., 2014; Weinstein, Husman, & Dierking, 2000; Zimmerman & Martinez-Pons, 1986) will help students to become increasingly aware of their agent role as learners, and to effectively focus their attention on the contents to be learned (Rosário et al., 2007; Weinstein et al., 2000).

In each session of these story-tools programs, and for each SRL strategy in each learning situation, students reported their declarative knowledge, procedural knowledge regarding the strategy, and conditional knowledge (e.g., goal-setting concerning assessment situations, completion of reports or writing assignments). Following Cleary, Callan and Zimmerman (2012) and Núñez, et al. (2013), a microanalytic methodology was used to help students to reflect upon their study practices, discuss how they usually implement their strategies, as well as learn other ways to cope with diverse learning settings and situations (see Table 2.2). Another common factor along the story-tools programs is the instructional sequence that can be briefly summarized in three steps: 1st reading of the stories; 2nd reflection about the stories; and 3rd solving practical tasks.

For each learning strategy (e.g., self-evaluating, organizing and transforming, goal-setting and planning, and seeking information), educators helped students to reflect upon their declarative, procedural, and conditional knowledge of these learning strategies across diverse learning contexts (e.g., academic situations, preparing for and taking tests, and completing homework). The educators guided discussions, explained how students could expand their strategy repertoire, instigating their agency and personal control, and helped them to project consequences onto their performance, promoting lifelong learning skills.

Table 2.2 *Example of the SRL microanalytic methodology.*

Learning strategy	Type of knowledge	Considering the 6 SRL contexts proposed (e.g., studying at home; completing writing assignments; preparing for and taking tests)
Goal-setting	Declarative Knowledge	What does "setting a goal" (e.g., in the classroom, at home, and so on) mean? Explain. What must be taken into account in goal setting (e.g., in the classroom, at home, and so on)? Explain.
	Procedural Knowledge	How do you usually set goals (e.g., in the classroom, at home, and so on)? What do you do if you have difficulties? Explain. Consider your goals (e.g., in the classroom, at home, and so on). What can you conclude?
	Conditional Knowledge	When is it appropriate to set goals (e.g., in the classroom, at home, and so on)? What can be done in case of having difficulties? Explain. Why is it important to set goals (e.g., in the classroom, at home, and so on)? Elaborate.

The use of reading and writing texts to train SRL strategies is the truly main feature of the SRL story-tools project, as it enables learners to discuss and discover different perspectives of how to cope with challenges and problem solving, and to design their own written texts. These reading and writing tools are based on the conviction that SRL can be promoted by modeling and by experiencing opportunities to develop autonomous learning. For example, focusing on the project Letters from Gervase, we elaborated a series of letters written in a confidential and narrative tone, in which a first-year college student describes and reflects on his experiences and learning processes in the academic context. While reading and discussing these letters, college students can experience vicarious learning through these narrations and inductively learn a self-regulated model to cope with their learning experiences.

Written text (e.g. narratives or storytelling), traditional tales, and fables are ways of organizing and delivering knowledge, but also of posing questions and doubts about human behavior. The obvious theoretical and practical implications of this methodology are well recognized nowadays, and play an important role in the educational process. Literature highlights that stories are an important tool in the educational process favoring children's development (Ellis, 1997; Erickson, 1995; Genisio & Soundy, 1994; Isbell, Sobol, Lindauer, & Lawrence, 2004; Meyer, 1995; Rosário et al., 2007).

Storytelling models the logical sequencing of ideas and fosters a personal approach while developing imagination. It also submerges listeners in the (re)authoring of the story, with undeniable implications in their personal and social development (Mallan, 1997). It is not surprising, therefore, to

find a close relationship between reading, writing or listening to school success stories and children's verbal aptitude (Cliatt & Shaw, 1988; Lyle, 2000).

Narratives are the main tools to organize our concept of time. It corresponds to the representation of an event or series of events clustered around some meaning. In this sense, stories do more than inform or instruct, indeed they make us who we are. In one of his first books about learning and instruction, Bruner (1986) presented narrative ways of thinking as an alternative way of facing reality. He defended narrative as a universal path used by all cultures, albeit with different matrices, to align experiences and assigning meaning. Tales and stories invite people to look inside themselves, reflect about their own behaviors and subsequent consequences as far as they can identify with the story's characters, their dilemmas, choices, and narrated adventures. In each of the above mentioned story-tools programs, the students are prompted to build their own meanings, their own understanding of the SRL narrative, and to reach the aimed conditional learning, transferring those skills learned and discussed in class to other academic domains or to their own life. As Rosário states (2004a), "we don't learn when we are taught or when we listen, but rather when we adopt, recreate and appropriate meanings. Learning is always an author's task." (p. 11). Through a coached analysis of a narrative, children and young people may be instigated to articulate their knowledge of SRL reasoning about characters' behaviors and their own.

These written texts serve as ground structures to effectively train students into SRL strategies, fostering procedural and conditional learning processes through an intervention methodology, in some way close to the self-regulated strategy development (SRSD) intervention approach (Graham & Harris, 2005; Harris & Graham, 1996), which included story writing and self-regulation strategy instruction.

Students often learn vicariously by observing other people's actions directly or indirectly (e.g., on movies, on television, on internet, and by reading books) (Zimmerman & Schunk, 2001). In this sense, the social cognitive framework - stressing that not all human learning arises from direct experience -, describes how observing others' behaviors and the resulting rewards or punishments tends to organize and motivate the observers' behavior (Pintrich & Schunk, 2002). Modeling refers to the process through which observers pattern their own thoughts, beliefs, strategies, and actions after observing models (Schunk, 2001). It turns out to be an important way of developing competencies, beliefs, attitudes, and behaviors. Teachers, parents, other adults and peers become, therefore, powerful models for the learners. Behaviors, verbal utterances, and even non-verbal expressions of significant

models can be considered, by the observers, as prompting cues for subsequent reproduction (Bandura, 1986).

Furthermore, modeling provides informative and motivational sources. Observing competent models performing actions successfully provides people with useful information regarding the sequence of actions to follow, in the hope of obtaining the same result (Craig, Sullins, Witherspoon, & Gholson, 2006). However, Schunk (1987) argued that the simple observation of a model performing a task (e.g., a friend, colleague, teacher or parent), is not enough to encourage the observer to perform it, regardless of how competent the model may have been. For this this type of learning to be effective, it is important for the individuals to perceive similarities between themselves and the model. In the modeling process, this is one of the most relevant motivational variables for the final outcome. Perceived similarity with the model is a fundamental aspect of judging one's own efficacy. For example, by observing peers experiencing success, children develop self-efficacy beliefs, and become more motivated to perform the task. The opposite also holds true. When children observe their peers being unsuccessful they are less likely to allocate effort and accomplish the task. The SRL processes and strategies already mentioned (e.g., time management, organizing information, monitoring progress) could be taught by social models. For this reason, and acknowledging the literature, role models could be used to promote behavior and SRL. Students may acquire by vicarious learning not only declarative knowledge regarding the nature of the learning strategies, but also procedural and conditional knowledge as useful tools for future independent learning.

2.4 Detailed description on SRL story-tools programs

This section aims at analyzing briefly each instructional program and their components. We describe and analyze the specific features of the learning and teaching activities, trying to explain their rationale and purpose. We also offer specific examples from the narratives and practical tasks that will help readers understand how the story-tools projects can be run. For motives of parsimony we will only analyze in detail the sessions of the program “Letters to Gervase”, for college students. Nevertheless, a brief description of the learning activities, supporting materials, and instructions of the other two programs is provided first (see Appendix A and B).

2.4.1 Yellow's trials and tribulations (promoting SRL in learners aged 5 to 10 years)

Yellow's trials and tribulations is a story designed and written for children under the age of 10 (Rosário et al., 2007a). The book tells the story of the disappearance of the color Yellow from the Rainbow, as well as the adventures experienced by the other rainbow colors whilst searching for their missing colleague. "We are all important so no one should be left behind" is the emerging message. Along the quest in search for Yellow, who should have not been left alone, the other colors of the rainbow meet new friends and learn useful SRL strategies to overcome difficulties and challenges they face along the way. The different chapters in the narrative can be read, discussed, and worked through either in class or at home, providing opportunities to acquire, practice, and reflect on the use of the SRL strategies embedded in the text always with the reading-writing processes as main tools.

In the story of *Yellow's trials and tribulations* a set of SRL strategies and processes used by the colors of the rainbow while searching Yellow are presented. The fact that the characters are colors and not children, albeit with a profile very similar to their own in the way they approach tasks - patent in both the language and the behaviors adopted -, enables the listeners/readers an analysis of the situation which is at the same time emotionally close but detached. Characters' behaviors, based on children's real life situations, allow them to distance themselves for the moment. Children are invited to discuss and analyze what is happening in the plot of the story, and try to apply this learning to their own life. The analysis of the models portrayed by the characters in the story, however, needs the involvement of educators so that their educational purpose can be discussed, fully understood, and hopefully transferred into children's life.

An example is provided bellow to illustrate the various phases of the SRL process, from the perspective of an ant when talking to a color of the rainbow. The planning phase takes place prior to performing the task. In this phase students set their goals, and select a repertoire of learning strategies to help them reach their self-set goals. At this stage, students are invited to decide what they want to do and plan how and when they will do it. Hand in hand with the story characters, children and adults can improve their declarative knowledge of the SRL process.

'(...) The Ant-general halted his troops and answered in indignation:

"- Mr. Red, Sir, we don't walk through the ground. We move across the field with a purpose - had it been possible, Mr. Red would have blushed. - As I was saying, we are an army organized and trained within the tradition PLEE - Mr. Red looked astonished, which fortunately was not

noticed by the Ant-general. - Before we charge, indeed before we do anything, we plan it thoroughly (**PL**EE). As our forefathers taught us, we first establish a plan for our maneuvers on the field. This means, we *think beforehand* (...)"

"- As I was saying, - the Ant-general continued with a military tone of voice -, in order to plan, we have to decide what we need to know and what we need to do for everything to run smoothly. Afterwards, to avoid any problems, we allocate time for each task."

(Yellow's trials and tribulations, Chapter 6).

The Execution phase of the task refers to the execution of the plan to reach the self-set goals. This means the implementation of a set of learning strategies selected to accomplish the tasks, and to control and monitor their effectiveness.

"- The second phase as follows is the execution phase (PL**E**E), meaning *to think during.* When we make a move, I coordinate the troops so that everything runs as planned. - The Ant-general spoke with confidence and authority. The colors stood closer joining their heads to absorb each word (...)

"- Each of our maneuvers in the field involves the displacement of means and efforts. We have to carry plenty of supplies and food to our pantry as scheduled. We can't afford to take the wrong road by mistake, or waste energy going around in circles, so I check our route all the time. In Ant Army jargon we call this operation 'monitoring'. Which means confirming that all is going on as planned - the colors were astonished with such wisdom."

(Yellow's trials and tribulations, Chapter 6)

In the Evaluation phase students assess if the learning tasks are progressing as expected, while questioning the reasons for the outcomes found and verifying how they measure up against the self-set goals. The appraisal feeds the planning of new tasks, restarting the self-regulation cycle (Rosário et al., 2007a).

"Finally we reach the third and last phase: the Evaluation (PLE**E**). This means *to think after.* When we finish a drill, we have to assess if we accomplished what we were supposed to, if we

carried enough food, if we run behind schedule, if we ended up too far from the food supplies... The PLEE cycle is closed, do you see?"

(Yellow's trials and tribulations, Chapter 6)

2.4.2 Testas's (mis)adventures (promoting SRL in learners from 5th theough 9th grades)

Testa's (mis)adventures, our second project, is a collection of five books aimed at 5th through 9th graders (10-15 years old) (Rosário, 2002a, b, c, 2003, 2004a, b). Testas, a student like many others, tells his own learning experiences in the various stories of the books. Adjusted to the demands of each school grade level, taking notes, solving problems, time management, goal setting, preparing for tests, preventing test-anxiety, and avoiding procrastination are examples of the SRL strategies worked throughout the various books of this collection. After reading the books in the classroom or at home, students work on the proposed activities that are mainly oriented to be solved through efficient reading-writing processes. The project's rationale and a set of tasks are presented in a manual for teachers and parents to enable the students to use SRL strategies in their work (González-Pienda, Fernández, Bernardo, Núñez, & Rosário, 2014; Núñez et al., 2013; Rosário, 2004b; Rosário, González-Pienda et al., 2010).

In this process, the role of parents or educators is fundamental, provided the meanings emerging from the story are not decoded unilaterally. With the help of parents and/or educators, children and youngsters should have the opportunity to discuss and reflect upon the various scenarios and behaviors proposed in the story-tool, in order to construct their own narrative. This short passage from the 9th Grade (15 years old) book of Testas can help to illustrate this idea:

> 'His solitude on the mountain taught him that the will to do something cannot be given, or bought, much less imposed. This yearning comes from our closeness with the task, and it grows as we gain trust and intimacy. We are not born mountain lovers, we learn her ways, her noises and smells; we learn the names of the birds nesting on her shoulders, the ways of the restless squirrels, and how to keep wolves at distance. Little by little, those boulders become family. We discover hiding places with our name on them, fall in love with the trees, and salute the cool spring water that washes away our nightmares. Our love grows, as does our wish to be there. This is the way on the mountain, as it is in life.' (Testas the Luso, p.16).

2.4.3 Letters from Gervase (Promoting SRL in 1st year college students)

Letters from Gervase is a book aimed at 1st year college students facing the process of adaption to University. At the core of this SRL tool are 13 texts, drafted as letters written by a first year student Gervase (Rosário et al., 2006). In these texts, Gervase describes his own experiences as a University freshman and reflects upon the SRL processes and learning strategies, academic adaptation process, and other academic and social challenges he is facing. Each letter focuses on one learning strategy whilst some activities to practice study, reading-writing, and SRL strategies are proposed in the manual of the project (Rosário et al., 2007, 2014; Rosário, Núñez et al., 2010). All of the 13 letters or only a few of them can be worked in the number of sessions deemed necessary (from 6 to 15). Sessions lasting from 60 to 90 minutes can be mediated by a lecturer in the classroom, by an educator in an extracurricular course or even by a counsellor in individual work sessions. Currently, it is also possible to program sessions in e-learning settings (see, Cerezo et al., 2010; Núñez et al., 2011).

Each letter is organized around a repertoire of learning strategies set by Zimmerman and Martínez-Pons in 1986 (e.g., goal setting, organization and transformation of information, taking notes, information seeking), corresponding to the three phases of the SRL process (e.g., forethought phase, performance phase, and self-reflection phase) (Zimmerman, 2002) (see Table 2.3).

This story-based tool was designed to promote students' analysis of the contents of the letters, followed by the discussion of the embedded SRL strategies with the help of an educator. For example, during the sessions the participants discuss the contents and the presented strategies and SRL processes aiming at fostering a deep approach towards the texts. College students are invited to analyze the stories told in the letters to extract the information considered relevant and to relate it to different tasks of writing. Working with this story-based tool provides students with the opportunity to reflect on their own learning processes, both at an individual and at a group level, with hopes of fostering student's motivation and academic engagement.

Table 2.3 *Contents and self-regulating strategies of some of the Letters from Gervase*

Distribution of the letters of the project	Contents and self-regulating strategies addressed
Letter No.1 *What does it mean, after all, adjusting to University life?*	Adaptation to University. Planning and time management.

Letter No.2 *What are my goals? What really guides my actions at all levels, i.e. my studies, my University attendance, my hobbies, sport and relationship with others... and even my lassitude?*	Setting Goals. Rules of goal setting (*CRAss).* Short-term and long-term goals. Study goals, and achievement goals.
Letter No. 3 *How can I take better notes?*	Organizing information: summaries, tables, diagrams and conceptual maps... Note taking. The Cornell technique. Controlling distractions.
Letter No. 4 *Do you know how to fight procrastination, Gervase?*	Time management. "To do" lists. Organizing the study environment. Procrastination. Relaxation techniques.
Letter No. 6 *Who rules your learning?* *How can one tell successful students apart?*	SRL. The Cyclical model of SRL PLEE (Planning, Execution, Evaluation). Setting Goals. Monitoring. Motivation.
Letter No.12 *What is Test Anxiety?* *How can one deal with Test Anxiety?*	Test anxiety. Aspects of anxiety (Feelings and Emotions). Internal and external distracters. Plagiarism and copy write. Relaxation techniques.

The *Letters from Gervase* program does not provide sessions of a rigid structure, nor prescribed times to develop the suggested activities. Sessions are a vehicle to work self-regulation skills in the classroom, with a flexible nature adjustable to the speeds and needs of the different readers/authors. Typically, each of the sessions followed the same design: (1) first, and for about 15 min, the students read and analyzed the assigned letter silently and individually, eventually taking notes. (2) Then, for about 45 min, in order to exchange ideas, promote problem solving and foster team work, the students were divided into small groups. Modelling, strategy learning, and reflection as tools to transfer the new knowledge to the academic domains and to daily life activities were the main goals of the SRL framework embedded in the letters. The tasks proposed to the students are chosen and selected from among the ones listed in the booklet of the program, for example, to write a draft with

ideas and conclusions (cf. Rosário et al., 2006). (3) Afterwards, for about 20 min, each group of students shared their written drafts with the other groups and had the opportunity to discuss ideas, achievements, concerns, and challenges with their classmates. (4) Finally, for about 10 min, the instructor ended the session, highlighting the major topics discussed, providing the students with a summary of the session's contents.

Some examples of summaries, as well as some proposed activities to be developed by the students during the sessions are provided in the booklet of the project (Rosário et al., 2006). The activities have to be selected from a suggested pool, or developed bearing in mind the specific needs of the target students, their self-regulation competences, academic proficiency, level of flexibility, and objectives.

2.5 Research evidences

Evidence from the published research with the story-tool programs to promote SRL strategies is summarized in Table 2.4. The results obtained from different empirical studies support the efficacy of this set of story-tools for improving self-regulatory strategies (motivational, cognitive, and behavioral) and academic performance in the different educational stages.

Besides assessing the efficacy of these story-tools programs, this line of investigation on SRL has provided valuable information on how the program outcomes may be mediated by the different conditions related with the design of the interventions. For example, regarding the time of implementation of the intervention programs, Núñez et al (2013) found that participating in a mentoring program to promote SRL using Testas story-tools led to significant improvements with regard to all the dependent variables (i.e., student use of SRL strategies, self-efficacy for and the perceived usefulness of SRL as well as mathematics and language achievement) after the 9-month intervention; significant effects had also been observed at 6 months, but only for some variables; however, no significant differences were obtained for any of the variables at 3 months. We will continue investigating the role of these story-tools to promote SRL and learning on specific domains, for example improving elementary students' competencies for writing compositions, or learning mathematics while working in computer based learning environments.

Table 2.4 *Resume of the research using story-tool programs to promote SRL strategies*

Study	Participants	Purpose	Design	Procedure/training	Variables assessed	Variables with statistically significant differences	Major highlights
Rosário et al., (2007)	Portuguese First year college students.	Evaluate the efficacy of the "Letters to Gervase" program.	A quasi experimental design including an experimental (EG) and a control group (CG), with pre and post evaluation.	The program was run in six 60 min weekly sessions after classes. Students from the CG did not receive SRL training.	LS, declarative knowledge; Approaches to learning (deep and surface); SRL strategies; Perceived usefulness of SRL strategies; Structures of the observed learning outcome.	LS, declarative knowledge; Surface approach to learning; Structures of the observed learning outcome.	*Results show the efficacy of the program for training SRL strategies. *Participating students decreased superficial approaches but did not increase deep approaches to studying. *CG did not show significant changes in pre-post test.
Rosário, Núñez et al. (2010)	First year college Portuguese and Spanish students.	Letters to Gervase program was assessed in two samples (Portuguese and Spanish students).	A quasi experimental design including an EG and a CG running in two universities from two countries. A pre-post evaluation was followed.	The intervention followed the same design in both Universities. Six 90-minute weekly sessions took place after classes. Students from the CG did not receive SRL training.	LS, declarative knowledge; Approaches to learning (deep and surface); SRL strategies; Perceived usefulness of SRL strategies; Self-efficacy for use of SRL strategies.	LS, declarative knowledge; Surface approach to learning; SRL strategies; Perceived usefulness of SRL strategies; Self-efficacy for use of SRL strategies.	* Data corroborate the efficacy of the intervention program as well as its cross-cultural validity. *Regarding SRL, posttest differences between the EG and the CG of both samples can be explained by the program.
Rosário, González-Pienda et al. (2010)	Fifth grade Portuguese students.	Assess the efficacy of "Testas" story-tool program to enhance study processes and foster deep approaches to learning.	A quasi experimental design including an EG and a CG with a pre-post evaluation was followed.	The program has been developed along a school year, in a one hour weekly tutorial sessions.	LS, declarative knowledge; Approaches to learning (deep and surface); Academic achievement (Mathematics and Portuguese Language).	LS, declarative knowledge; deep approach to learning; surface approach to learning.	*Results show the efficacy of the program for the training of study strategies. * Regarding academic achievement no statistically significant differences were found.
Núñez et al., (2011)	Spanish college students.	Assess the efficacy of Letters to Gervase for promoting SRL using ICTs as support.	A quasi experimental design including an EG and a CG with a pre-post evaluation was followed.	The thirteen weekly sessions were available online for students to work with during 15-days.	SRL strategies; SRL when learning from texts; Approaches to learning (deep and surface); Academic	SRL strategies; SRL when learning from texts; Approaches to learning (deep and surface); Academic achievement.	Participating students: * Improved their declarative knowledge; * Improved academic achievement; * Were highly satisfied with the use

					achievement.		of a CBLE as platform to learn SRL.
Núñez et al., (2013)	Seventh grade Portuguese students.	Assess the efficacy of a middle school-based mentoring program using Testas story-tool designed to increase SRL strategies.	A longitudinal cluster randomized trial study design with a comparison group was used.	The weekly one-hour mentoring sessions occurred after classes and lasted the entire school year.	SRL strategies; Self-efficacy for use SRL strategies; Perceived usefulness of SRL strategies; Study time; Academic achievement (Mathematics and Portuguese Language).	SRL strategies; Self-efficacy for use of SRL strategies; Perceived usefulness of SRL strategies; Study time; Academic achievement for Mathematics.	*Findings suggest that the mentoring program was effective to promote SRL strategies * EG students increased their SRL competences to meet school demands better than students from the CG. *The effect size of the intervention depended of the duration of academic mentoring.
Rosário et al., (2014)	First year students from four universities at different countries and continents.	Assess the effectiveness of Letters from Gervase with college students from different cultural, linguistic, and educational backgrounds.	Quasi experimental design including an EG and a CG running in four universities from four countries. A pre-post evaluation was followed.	The four participating universities executed the program following the exact same design. The program was implemented in the first academic semester, on a weekly basis (90-minute for each of the six sessions).	Knowledge of SRL; Approaches to learning (deep and surface); SRL strategies; Perceived usefulness of SRL strategies; Self-efficacy for use of SRL strategies Structural complexity of the learning outcomes.	Findings show that the program 'Letters from Gervase' was efficacious both in promoting the use of SRL strategies and in improving the motivational variables (e.g., self-efficacy for SRL).	*Findings indicate the effectiveness of the program in enhancing a set of motivational variables and the use of SRL strategies. *Data were consistent across the different cultural and academic contexts in which the program was implemented.
González-Pienda et al., (2014)	Seventh grade Spanish students.	Evaluate the efficacy of "Testas" program to enhance seventh graders' study processes.	Pretest-posttest design with no CG	The program was developed along a 12 one-hour weekly sessions.	Knowledge of SRL strategies; SRL strategies; Weekly study time.	Knowledge of SRL strategies; Weekly study time.	* Findings show statistically significant changes in students' knowledge of SRL strategies and study time, but not in SRL strategies. *When the sample was stratified into three groups (high, moderate, and low), findings show that students in the lower group profited most from the intervention on all three variables.

2.6 Conclusions

Despite the positive results obtained, future research should further investigate the long-term effects of these interventions. For example, the analysis of the transfer of the SRL learning strategies to the following semester/ along the school year by means of experimental designs using repeated measures with follow-up assessments. Most of the variables assessing the efficacy of the program were collected through self-reports, which is an important limitation (Zimmerman, 2008). To tap into SRL procedural nature, future research using these story-tools programs should consider including measures of SRL as an event (Boekaerts & Corno, 2005). An example could be collecting students' real time perceptions of the academic environment and log diaries of their study process or writing activities (Núñez et al., 2013). Lastly, the lack of perceived instrumentality of the SRL strategies in learning, found in some studies, indicates the need of improving the quality of the teaching process by way of enrolling teachers in programs aiming at improving the use of the SRL in classrooms.

Even with these limitations, globally our results have clear implications for designing SRL training programs and could provide an important contribution to understand why these programs could be effective under some conditions but not others. In accordance with the results of prior investigations, our findings suggest, overall, that SRL training using story-tools effectively improves the knowledge of SRL strategies, as well as develops self-efficacy and the perceived usefulness of SRL strategies in school but not in college.

The SRL contents discussed throughout our programs (e.g., Yellow trials and tribulations, Testas's story-tool) met students' expectations and immediate academic challenges (e.g., time management, procrastination, note taking, academic distracters, and goal setting). This sense of usefulness might have increased students' agent role in the learning process as well. Globally, our SRL story-tools programs proved to be positive educational tools for promoting learning strategies and writing competences.

Boekaerts and Corno (2005) called for preventive school-based interventions aiming at enhancing students' learning strategies and metacognitive skills in order to enable them to interpret school demands from a self-regulatory framework. For example, it is important to develop instructional methods for the improvement of writing, such as text analysis (Graham et al., 2012) or the reading-writing relationship, and their shared processes (Jiménez, 2012). In fact, recent literature reviews on

SRL (Boekaerts & Corno, 2005; Dignath et al., 2008; Winnie & Perry, 2000) suggest the need to find ways of promoting SRL in educational settings, highlighting students' proactive role in an ecological environment. Therefore, middle school educators and administrators, lectures and directors of departments should increase the number of programs to improve these types of skills and strategies (Cleary & Zimmerman, 2004; Dignath et al., 2008; Rosário et al., 2014).

The SRL story-tools, based in students' academic experiences of writing have been designed to promote SRL, as they set the stage to engage students in their learning process as well as achieve success in school and in life. We shall continue to research this story-tools framework as we believe stories can play an important role in teaching and promoting SRL and writing.

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2.8 Appendix A

Structure, contents, and self-regulating strategies of *Yellow's trials and tribulations (promoting SRL in learners aged 5 to 10 years).*

	TITLE	Reading	Reading Comprehension	Objectives and Skills	Activities	Self-reflection tasks
SESSION 1	The beginning...	Chapters 1 and 2	Questions about the chapter and task completion	Promotion of the ability of being respectful with peers. Development of class rules.	Development of a confidentiality agreement. Production of a rules list.	Why are we here?
SESSION 2	Reading makes me feel	Chapters 3 and 4	Questions about the chapter and task	Understand the importance of	Task "how to make a plan	Why is it better to plan

	good!		completion	reading. Build a definition of a plan. Knowing how and when to conduct a plan.	considering the environment and the available time".	things?
SESSION 3	I make a plan, execution, and evaluation.	Chapters 5 and 6	Questions about the chapter and task completion	Define the 3 phases of the SRL model: plan, execute, and evaluate.	Fish origami, to implement the SRL model.	Why is it better to divide goals into small steps?
SESSION 4	I like learning more.	Chapters 7 and 8	Questions about the chapter and task completion	Reflect on the challenge of working in group and the inherent personal gains. Debate using an organized speech.	Activity "searching strategies and objectives" to make tasks of daily life.	Development of an essay on the model of SRL. Refection on how we did it.
SESSION 5	I´m a detective, I research, and I solve my own problems!	Chapters 9 and 10	Questions about the chapter and task completion	Behavior analysis and responsibility assumption. Definition of problem. Identification of the students most common behavior problems (e.g., laziness, lying, disobedience)	Activity: "what do I do if..."., students should analyze the situation and propose an appropriate behavior.	Why should we control our own behavior? What does it mean to procrastinate?
SESSION 6	My slogan: "When I´m wrong, I also learn".	Chapters 11 and 12	Questions about the chapter and task completion	Reflect calmly. Understand that if we do not find the answer on the first try, to become discouraged is not an option. Promote the ability to learn from failures.	Activity in which students have to think about 3 syllable words starting with "TE".	Why it does not matter if we are wrong? How could an error be a friend?
SESSION 7	The podium of my trophies... -First: constant organization	Chapters 13 and 14	Questions about the chapter and task completion	Analyze the organization and time management of	Complete schedule for home activities.	Why do we need to be organized? What does it

	-Second: never give up -Third: not to waste time.			our lives. Explain that a good organization is a safe path to the academic success.		mean time management?
SESSION 8	Strategies with volition sauce.	Chapters 15 and 16	Questions about the chapter and task completion	Discuss professional values, effort, concentration, and constant work.	Task to exercise concentration and willpower.	Why do we have to be attentive in class?
SESSION 9	Fool proof tricks: tidy notebooks, highlighting, and many schemes!	Chapter 17	Questions about the chapter and task completion	Recognize the importance of LS. -Learn how to take notes and highlight a text. -Learn how to make a scheme and a mind mapping.	Activity "The Solar System" making a scheme from the proposed text.	Why do schemes help us to review the school contents?
SESSION 10	I´m already a brilliant student!		The whole class makes a book summary	Promote the ability to argue and debate in an environment with diversity of opinions.	Activity: "Now you´re a super-student", Students have to advice class-mates on how to improve achievement.	Take home message. Students are asked to make a summary of the topics worked.

2.9 Appendix B

Structure, contents, and self-regulating strategies of *Testas's (mis)adventures (promoting SRL in learners from 5th through 9th grades).*

Sessions and self-regulating strategies	Activities
Session No.1 *Macro-strategies/SRL phases: Planning, execution, and assessment*	Identify strategies from each phase of SRL through the model's actions.
Session No. 3 *Planning strategies and summarization strategies*	Propose planning strategies and strategies to prevent and cope with problem situations. Create a summary according to the phases of self-regulation.

Session No. 4 *Organization strategies, SRL, and procrastination*	Organize an activity according to the phases of self-regulated learning. Analyze procrastination-related excuses and devise strategies to avoid it.
Session No. 5 *Analyzing the phases of SRL in writing (planning, execution, and assessment strategies). Information-organizing strategies*	Analyze common writing difficulties. Make concept maps.
Session No. 7 *Writing (planning, execution, and assessment strategies)*	Write an opinion article utilizing SRL strategies. Analyze the difficulties faced and propose ways to overcome them.
Session No. 8 *Introduce external and internal distractions, and causal attributions.*	As a group, analyze distractions and causal attributions that can make it difficult to study.
Session No. 11 *Test-taking strategies. Problem-solving strategies (steps).*	Propose strategies to cope with test-taking. Solve a problem.

2.10 Appendix C

Extension of the SRSD model through the story-tool *Yellow trials and tribulations*

The instructional program *Yellow trials and tribulations* (Rosário et al., 2007) includes the same practical tasks of the Self-regulated Strategy Development (SRSD) model (Graham and Harris, 2003). The sessions start with the reading of the book chapters that provide opportunities to learn useful self-regulated strategies while the characters are facing different challenges. The characters' behavior, based on children's real life situations, allows students' to distance themselves from the situation and to reflect about what is happening. This learning permits them to transfer it to their own life and learning tasks (i.e. writing).

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An overview of the 4th lesson that illustrates the PLEE phases (Rosário, 2004) from the perspective of an ant in the story-tool *Yellow's Trials and Tribulations* is conducted hereafter. The lesson can be briefly summarized in three steps: i) reading of chapter 6; ii) reflecting about the story; iii) and solving practical tasks according to the SRSD model.

Appendix C.1 Reading of the book: Chapter 6

'(...) The Ant-general halted his troops and answered in indignation:

"- Mr. Red, Sir, we don't walk through the ground. We move across the field with a purpose - had it been possible, Mr. Red would have blushed. - As I was saying, we are an army organized and trained within the tradition PLEE - Mr. Red looked astonished, which fortunately was not noticed by the Ant-general. - Before we charge, indeed before we do anything, we plan it thoroughly (**PL**EE). As our forefathers taught us, we first establish a plan for our manoeuvres on the field. This means, we *think beforehand* (...)"

"- As I was saying, - the Ant-general continued with a military tone of voice -, in order to plan, we have to decide what we need to know and what we need to do for everything to run smoothly. Afterwards, to avoid any problems, we allocate time for each task."

"- The second phase as follows is the execution phase (PL**E**E), meaning *to think during.* When we make a move, I coordinate the troops so that everything runs as planned. - The Ant-general spoke with confidence and authority. The colours stood closer joining their heads to absorb each word (...)"

"- Each of our manoeuvres in the field involves the displacement of means and efforts. We have to carry plenty of supplies and food to our pantry as scheduled. We can't afford to take the wrong road by mistake, or waste energy going around in circles, so I check our route all the time. In Ant Army jargon we call this operation 'monitoring'. Which means confirming that all is going on as planned - the colours were astonished with such wisdom."

"- Finally we reach the third and last phase: the Evaluation (PLE**E**). This means *to think after.* When we finish a drill, we have to assess if we accomplished what we were supposed to, if we carried enough food, if we run behind schedule, if we ended up too far from the food supplies... The PLEE cycle is closed, do you see?"

Appendix C.2 Reflection about the PLEE model

Throughout the reading of the story, small breaks shall be done to verify if the students are following the story and understanding everything what the characters are going through.

Appendix C.3 Practical task embedded in the SRSD model – stage 2: *Discuss it*

1. Using a LCD projector or a chart paper, each PLEE phase must be carefully explained and discussed in class.

2. Different examples shall be provided (e.g., go on a trip, set the table for dinner, do homework, make a drawing, study for a test) and each box must be filled in collaboration with students by writing notes on a planning chart (see appendix B).

3. The learning strategy, *set a goal*, taught in the previous lesson (lesson 3) shall be remembered as an important strategy to be used while planning.

"- To reach the top of a tree, you need to start climbing, but climbing a branch at a time, that's what my grandfather taught us" – said the squirrel Sarabico (see chapter 5).

4. Strengthen the importance of monitoring (execution phase) while performing the task. It is very important to control every step, so that their self-goals can be accomplished.

5. Furthermore, the evaluation phase equally plays an important role. Student's must question themselves about their outcomes and verify if their goals were reached or if any changes are needed.

6. Once students have a good understanding of the PLEE model, and how important it is for almost everything they do on their daily basis, inquire them to think about it if they had to write a story. Next, ask them to tell you out loud how they would do it using the three phases of the model and why they think it is important to do so.

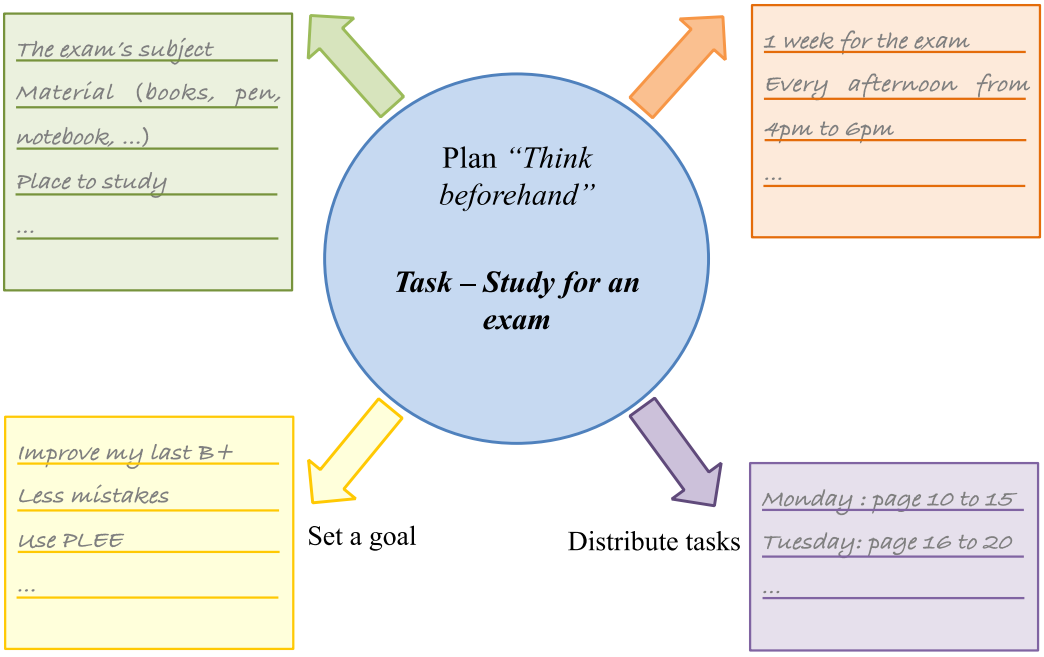
7. Make a short summary about what was discussed and tell students that next time the mnemonics already introduced in program will be recalled in order to see if they still know how and when they should use them.

2.11Appendix D

Planning chart

"We have to decide what we need to know and what we need to do for everything to run smoothly"

"To avoid any problems, we allocate time for each task"



3. PROMOTING SELF-REGULATORY SKILLS IN WRITING USING A STORY-TOOL

Högemann, J., Rosário, P., Núñez, J. C., Rodríguez, C., & Valle, A. (in press). Promoting self-regulatory skills in writing using a story-toll. In R. Fidalgo, K. Harris & M. Braaksma (Eds.), *E-book: Design Principles for Teaching Effective Writing*. Leiden: Brill Editions.

3.1 Introduction

This E-Book chapter describes a 10 session instructional program for elementary school aiming to promote general and self-regulation skills in writing compositions. The proposed instructional program combines the Self-Regulated Strategy Development (SRSD) model by Graham and Harris (2003), which is a proven highly effective instructional writing program, with the Story-Tool "*Yellow Trials and Tribulations*" by Rosário, Núñez and González-Pienda (2007). The latter is a story written for children under the age of 10. The book tells the story of the disappearance of the color Yellow from the Rainbow, as well as the adventures experienced by the other rainbow colors whilst searching for their missing colleague. Along the quest in search for Yellow, who should have not been left alone, the other colors of the rainbow meet new friends and learn useful self-regulated learning (SRL) strategies to overcome difficulties and challenges faced along the way. The different chapters in the narrative can be read, discussed, and worked through either in class or at home. The story provides opportunities to acquire, practice, and reflect on the use of the SRL strategies embedded in the text always with the reading-writing processes as main tools. The fact that the characters are colors and not children, although with a profile very similar to their own in the way they approach tasks, enables the students to discuss a number of situations that they may be acquainted with. Children are invited to examine what is happening in the plot of the story, and hopefully transfer this learning to their own life and to other learning tasks (i.e., writing compositions). The main goal of the SRL instructions is to help the students to master the three kinds of knowledge about learning strategies (i.e., declarative, procedural and conditional) (Núñez, Rosário, Vallejo, & González-Pienda, 2013), which are key elements for supporting students along the SRSD instruction.

Each lesson sequence is summarized in three steps: (i) reading (ii) and reflection about the story (approximately 30 minutes for both steps) and (iii) solving practical tasks (approximately 60 minutes). In the end of each lesson, students select as a take home message a sentence/quote from the chapter that was read.

3.2 Description of the ten sessions of the proposed instructional program

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Lesson 1

Purpose

The first lesson starts with the reading of the first three chapters of the Yellow Trials and Tribulations story. Students are expected to learn some features of the story, for example, the hood where the story takes place, the main characters and their characteristics, and also to meet some of their friends. Students are invited to discuss and analyze what is happening in the adventure. In chapter 3, they met the learning strategy *planning* for the first time.

Materials

The story-tool Yellow Trials and Tribulations
Pen or pencil
Student folder
School board or chart paper
Color pens or colored chalk

Steps for the teacher to follow

Lesson 1.1 Reading of the book

Start the lesson by reading the chapters 1, 2 and 3 [The setting where the story takes place, Wood-Without-End, and the colors are presented. Readers learn that the Yellow ran away from the rainbow and all the colors decided to go on a quest for Yellow. On their journey, colors met the *River-of-Sobs and the Smiling-Eagle,* who introduced them the strategy of planning].

Lesson 1.2 Reflection about

Use small breaks throughout the reading of the story to check whether students are following the narrative, and understanding the SRL message embedded in the text.

For example, discuss with children the following quotes from the book:

"(...) You know, River-of-Sobs, we are the seven colors of the rainbow and we are all important. So no one should be left behind".

"(...) I tell you that: there is a way, hipps, there is always a way, hipps. Who doesn't give up, will get there, hipps. You may go through difficult moments, but never forget this. Have a good trip, hipps. Hope you plan it well".

"(...) Plan means thinking before doing anything. To think when, how and with which materials we will do what we want to do. For example, when I glide through the sky and I spot a delicious rabbit running through the trees, I start planning my catch: I pick a favorable air current and fly down with speed, capturing the prey with my talons. I never waste energy flying back and forth; this is the secret of my effectiveness as a hunter".

Lesson 1.3 Practical task

1. Based on the brief analysis of the psychological description of the rainbow colors presented in the first chapter, ask students to choose the rainbow color that best defines their current behavior. This task is called "*Which color(s) am I feeling today?*" (e.g., Green, looking for an adventure; Violet, strong and brave; Indigo, feeling lazy and tired). Students should also be invited to explain the reasons underpinning their choices. This task allows students to examine and reflect on their feelings, while making connections with the main characters.

2. At the beginning of the second chapter, the colors of the rainbow realize that their friend Yellow is missing and they start looking for him. Ask students some questions about what could have happened.

Where would Yellow hide himself? Why?

If Yellow would get lost in your house where would he hide? Why?

When we get lost what shall we do? (give an example to help children)

Why do we want to hide ourselves sometimes?

3. Recall the definition of "Planning" and ask students to give examples about planning when they are in:

the classroom...

the kitchen...

the playground...

their room...

the bathroom...

4. Invite students to write a letter to the storyteller, uncle Jarbinhas, telling him about the daily life in the Wood-Without-End (the location where the story takes place). Call students' attention for the need of planning, and help them to think how to plan the task. Write on the board the following questions to help them plan the task:

What will I write?

Which materials do I need to write a letter?

Where and when will I write?

5. Define with your students a spot in the room for posting the *Yellow Trials and Tribulations* materials. Select from the story the slogans said by the characters (e.g., we are all important and no one should be left behind; who doesn't give up, will get there; with wings closed birds cannot learn how to fly) and discuss their meaning with children. Call students' attention to the slogans posted whenever needed (e.g., low motivation, procrastination behaviors, when distracted).

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Lesson 2

Purpose

The second session aims to develop student's prior knowledge on composition, to discuss and explore the characteristics of a good story. General writing strategies (i.e., POW, *P*ick my ideas, *O*rganize my notes, *W*rite and say more, see Appendix A) will be presented and discussed with

students. Through the reading of chapter 4, teachers may learn any negative attitudes towards writing, and, if needed, encourage students to value the role of effort and commitment in their learning process. Teachers may support students to change their negative thoughts into positive beliefs (e.g., *"I can do it, if I use the right strategy"; "Change I can't do it for I can still do it"*). Some quotations of the story tool may help on this task, for example that by the River-of-Sobs: *"To learn more and grow wiser depends mainly on what each one does".*

Materials

The story-tool Yellow Trials and Tribulations	School board or chart paper
Pen or pencil	Color pens or colored chalk
Student folder	

Steps for the teacher to follow

Lesson 2.1 Reading of the book

Before continuing reading the book, ask children to tell what they remember of the last 3 chapters and to define *planning* in their own words. Then read chapter 4 [The colors met the Bird-Teacher who was giving a class on *how-to-fly* for little bird-students. The Bird-Teacher told the little birds a story about a lazy deer who did not listened to the teacher advice's friends and hurt himself while competing with a grasshopper].

Lesson 2.2 Reflection about

Use small breaks throughout the reading of the story to check whether students are following the narrative.

Discuss the following sentences:

"The Bird-Teacher flew by, encouraging them [bird-students] and correcting their movements, but everyone knew that the committed help of the Bird-Teacher was not enough to help them learning. Each one had to make every effort and to work hard. To learn more and grow wiser depends mainly on what each one does."

"With closed wings no one learns how to fly!" Ask children to build other synonymous sentences and discuss the practical implications of each one (e.g., with tied legs no one can run; with closed hands no one can write; with closed eyes...).

Lesson 2.3 Practical task

1. In the story-tool Yellow Trials and Tribulations, some little birds were afraid of flying. Sometimes children and adults are also afraid of new situations. Discuss with students the questions below and encourage them to be creative with their answers.

- What might children be afraid of and why? How can fears be erased?
- How could we name the "rubbers of fear"? How would they work?
- Can children be afraid at school? Of their teachers? Of doing something wrong in math? Of writing?
- How do they face this fear?
- What did the *Bird-Teacher* said about that?

2. Tell students that from today on, after reading the story-tool, they will be doing hands-on activities to learn a set of learning strategies, as well as writing strategies. These writing strategies are like "tricks" that good writers use when they want to write something. Ask them if they have an idea about which strategies or "tricks" you are talking about.

3. Using a chart paper or the board, write the mnemonic POW and explain what each letter stands for:
P – *P*ick my ideas (i.e., decide what to write about);
O – *O*rganize my notes (i.e., organize the ideas for writing in a writing plan);
W – *W*rite and say more (i.e., change and improve the plan while writing).

4. Good writers start planning by writing down notes or ideas about a subject. Explain that the mnemonic POW is a "trick" that good writers use when they want to plan a writing task.

5. Ask students which elements define a good story, and what do good writers write down when they plan a story.

6. Introduce **S-A-C** [principal steps of a story: Setting (*S*), action (*A*) and conclusion (*C*)] as a mnemonic used by good writers to organize their notes/ideas (the O of POW). Answering the questions in each step will help students to become familiar with the S-A-C mnemonic.

<table>
<tr><th>S (setting & characters)</th><th>A (action)</th><th>C (conclusion & emotions)</th></tr>
<tr><td>1. Where does the story take place?</td><td rowspan="3">4. What do the main characters do or want to do; what do others characters do? What happens then?</td><td>5. How does the story end?</td></tr>
<tr><td>2. When does the story take place?</td><td rowspan="2">6. How do the main characters feel? How do other characters feel? Add a moral if possible.</td></tr>
<tr><td>3. Who are the main characters? (Describe them).</td></tr>
</table>

7. Write POW and S-A-C on the board or on a chart paper and practice by reviewing the meaning of those mnemonics. Help children to understand that *"Good writers use these writing tools, because it helps them to plan a good story without leaving any part behind".*

8. Open the story-tool *Yellow Trials and Tribulations* on chapter 4 (Bird-Teacher tells a story about a lazy deer), and ask students to use the mnemonics to identify the parts of the story (practice using the six questions aligned with the three S-A-C steps).

9. Next, ask children to discuss the moral of the story of the lazy deer.

10. Announce students that in the next session they will be asked to tell what POW and S-A-C mean from memory.

11. For homework students are invited to write a short story (see the topic). Help students to think about how to plan the story and write on the board the steps:

- What will I write? "Don't forget POW and S-A-C!"
- Which materials will I need to write the story?
- Where and when will I write it?

Topic – *Imagine you're in the circus and the magician transforms you into an animal. Retell the adventures you lived as the animal you were turned into.*

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Lesson 3

Purpose

The third session aims to revisit the general writing strategies (i.e., POW) and to discuss the SRL strategies (i.e., self-instructions, goal setting, self-assessment and self-reinforcement) to be used before, during and after writing a story. Students will learn how to plan, self-monitor their performance and evaluate their stories using the story written for homework at session 2. Following the reading of the book, students will analyze the steps of the problem solving process and practice the implementation of those steps using specific tasks. Each step must be carefully explained.

Materials

The story-tool Yellow Trials and Tribulations	School board or chart paper
Pen or pencil	Color pens or colored chalk
Student folder	Planning sheet
Projector	Tree-goal chart

Steps for the teacher to follow

Lesson 3.1 Reading of the book

Before continuing with the reading of the book, ask the students to summarize the last chapters. After this initial revision, you may start with the reading of chapter 5 [Colors design a plan to search for Yellow and set proximal goals. The squirrel Sarabico helps on the task].

Lesson 3.2 Reflection about

Test to see if your students still remember the meaning of planning.

"Yes, we have to think about what we will do, and about what we need to prepare before moving on to the next step, as the Smiling-Eagle taught us".

Discuss with students this sentence, encouraging the transfer to school and non-school tasks. *"The goal was far and they had to divide it into small steps. – To reach the top of a tree, you need to start climbing, but climbing a branch at a time, that's what my grandfather taught us – said the squirrel Sarabico".*

Lesson 3.3 Practical task

1. To help students' practice divergent thinking and the process of generating alternatives, carry out the *Colors Backpack* task. This task consists on asking students to imagine that each color needs to prepare its backpack before initiating the search for Yellow. Each color can only carry 10 objects. Ask students if they can help the colors to prepare the backpack and foster divergent thinking. Make students look for different solutions and to justify their final decisions. Schematize and track on a chart paper or on the board the various suggestions and the class final proposal for the backpack task.

2. Write on a chart paper or on the board, the mnemonics POW and S-A-C. Test to see if students still remember their meaning.

3. Tell students that from this session on they will be asked to use a *planning sheet* (Appendix A) when writing a composition. This *planning sheet* will help them in planning their stories, including those assigned for homework. This *planning sheet* includes the six questions of the S-A-C steps, which will help students remembering and organizing their notes/ideas.

4. Pass out a *planning sheet* to each student and project it by using a projector. Discuss the meaning of POW by pointing out the *P*, the *O* and the *W* on the projected *planning sheet*. Emphasize that S-A-C is the 'trick' for the **O** of POW. Using a random story topic provide examples on how to fill in the boxes of the *planning sheet*.

5. Once students understand how to use the *planning sheet* and its potential contribute to promote the quality of compositions, deliver them the composition done for the last homework (homework 2) and

tell them to read it again. Explain them that they are going to follow a *backwards strategy*: using the ideas of a composition already done (homework 2), to fill-in the boxes of a *planning sheet*. Then, ask them to complete the boxes of the *planning sheet* by writing the ideas of the composition. Check with them if any box is empty and reflect on that meaning (e.g., part of the story is missing; part of the story is incomplete).

6. After students' assessment of their own compositions, they will be asked to set a goal to overcome their writing difficulties. Support students on this task by explaining the importance of setting proximal goals to enhance the quality of writing. The squirrel Sarabico words, a character of the story-tool, may be of some help: *"The goal was far and they had to divide it into small steps. – To reach the top of a tree, you need to start climbing, but climbing a branch at a time, that's what my grandfather taught us."*

7. Project on the wall the *tree-goal chart* (see Appendix B) to help students transfer this statement to their learning context. Students should set proximal and realistic goals for each branch of the tree starting from the lower branches. When a goal is reached a new goal should be set for the next branch of the tree.

8. Emphasize the idea that the last goal (number 5) is their long-term writing goal. In order to get there, they will have to climb a branch at a time, i.e. they will have to accomplish a number of proximal goals first.

9. For homework, the students must write a story (see topic) using the *planning sheet* provided.

Topic – *Imagine that you were on a boat school trip. Suddenly, the boat was caught in a big storm and shipwrecked. Write a story about your adventure as a castaway and your life in a desert island*.

10. Before leaving the classroom, the students should be informed that the next session will begin with a short quiz to test their understanding of the contents learned.

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Lesson 4

Purpose

The purpose of the fourth session is to identify, define and apply the three phases of the self-regulatory process (i.e., plan, execute and evaluate) in the context of different daily and learning tasks. In this session, the general writing and SRL strategies should be addressed by recalling the mnemonics learned.

Materials

The story-tool Yellow Trials and Tribulations	Color pens or colored chalk
Pen or pencil	Planning sheet
Student folder	PLEE model (see Appendix C)
Projector	The PLEE chart (see Appendix D)
School board or chart paper	Tree-goal chart

Steps for the teacher to follow

Lesson 4.1 Reading of the book

Chapter 6 [The colors met the General-Ant and the army of ants and learnt the SRL process through their experience].

"-'Before we charge, indeed before we do anything, we plan it thoroughly (**PL**EE). As our forefathers taught us, we first establish a plan for our maneuvers on the field. This means, we *think beforehand'.* (...) –'in order to plan, we have to decide what we need to know and what we need to do for everything to run smoothly. Afterwards, to avoid any problems, we allocate time for each task'. (...) –'the second phase as follows is the execution phase (PL**E**E), meaning *to think during.* When we make a move, I coordinate the troops so that everything runs as planned'. (...) 'Each of our maneuvers in the field involves the displacement of means and efforts. We have to carry plenty of supplies and food to our pantry as scheduled. We can't afford to take the wrong road by mistake, or waste energy going around

in circles, so I check our route all the time. In Ant Army jargon we call this operation 'monitoring'. Which means confirming that all is going on as planned' - the colors were astonished with such wisdom. – 'Finally we reach the third and last phase: the Evaluation (PLE**E**). This means *to think after.* When we finish a drill, we have to assess if we accomplished what we were supposed to, if we carried enough food, if we run behind schedule, if we ended up too far from the food supplies... The PLEE cycle is closed, do you see?'"

Lesson 4.2 Reflection on the PLEE model

Use small breaks throughout the reading of the story to check for students' understanding of the narrative and the SRL message embedded in the text.

Lesson 4.3 Practical task

1. Write on a chart paper or on the board the mnemonics POW and S-A-C. Test to see if students still remember the meaning of the mnemonics. Reassure that students understand that S-A-C is the 'trick' for the **O**, and also that they take some time memorizing it, as they will be tested throughout every session.

2. Using a projector or a chart paper, each phase of the SRL process: *PLEE* (i.e., Planning, Execution and Evaluation) must be carefully explained and discussed in class (see Appendix C).

3. To help children learn the SRL contents discussed, different examples of the application of PLEE model should be provided (e.g., go on a trip, write a storyboard, do the homework, make a drawing, outlining a composition, solving a math problem).

4. Once students show a good understanding of the PLEE model, and of its relevance as a framework for coping with daily tasks, discuss with children the application of PLEE to plan a story.

5. Next, using the *PLEE chart*, ask students to recall the strategies learned to outline a story (e.g., POW and S-A-C), and to fill in the empty boxes with writing notes (see Appendix D). This chart was designed to help students organize the planning of their writing activities.

6. Emphasize the importance of monitoring (execution phase) while performing the task. It is important to stress the need for carefully control every step of the process, so that students' self-set goals can be accomplished.

7. Finally, address the process of the evaluation phase. Help students to analyze their outcomes, to check if their goals were reached and decide what changes, if any, are in need to be implemented for reaching the self-set goals.

8. The session ends with students writing down the topic for homework. Encourage students to recall information previously learned (e.g., typical errors, corrections of that errors) and the goal set (see *tree-goal chart*) when writing a new story.

Topic: *Describe the adventures of the gray pencil, who went out of its case and initiated an adventure around the world. He colored in gray everything he found on his way, without thinking about the consequences, until...*

9. Students should be informed before leaving the classroom that the next session will begin with a short quiz to test their understanding of the contents learned.

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Lesson 5

Purpose

The purpose of lesson five is to model the planning of the composition using a set of general (i.e., POW) and SRL strategies (i.e., self-instructions, goal setting, self-assessment and self-reinforcement) taught. Teachers modeling lessons (teachers think out loud how to plan a composition using the SRL strategies) will help students to learn how to apply these strategies and develop competencies, attitudes and beliefs, while writing independently. The modeling process is one of the most relevant motivational variables for the final product. Self-instruction, self-monitoring and self-

reinforcement should match student's verbal and style language. In this lesson, following the reading of the book, the students will be faced with the importance of peer and collaborative work.

Materials

The story-tool Yellow Trials and Tribulations
Pen or pencil
Student folder
Projector
School board or chart paper
Color pens or colored chalk
Planning sheet
The PLEE chart
Tree-goal chart
Lined paper
Quality checklist

Steps for the teacher to follow

Lesson 5.1 Reading of the book

Make a short summary of the chapter read in the last session and start reading chapter 7 [The colors found shifting sands on their way. They built a plan, but while they were executing the movement to pass over the shifting sands, the Orange felt exposing himself to the danger of being swallowed up. All the colors helped on the task and eventually they solve the problem by saving Orange].

Lesson 5.2 Reflection about

After reading the sentence "- *Now we should continue walking, because the way is forward"*, ask the students if they remember a character stating anything similar.

The *River-of-Sobs* said: "- *Who doesn't give up, will get there, hipps."*

"(...) - When everyone helps, everything is much easier." Highlight the role of peer and collaborative work, by giving an example of something that they have achieved as a class.

"(...) At the end of another adventure, although everyone was very tired, they were closer to find Yellow, which was the most important thing." – Point out the importance of reaching the self-set goals, by dividing them into small steps, as previously stated in chapter 5 by the squirrel Sarabico: *" – To reach*

the top of a tree, you need to start climbing, but climbing a branch at a time, that's what my grandfather taught us.".

Lesson 5.3 Practical task

1. Firstly, verify if the students still remember the meaning of the mnemonics PLEE, POW, S-A-C. Recall that S-A-C is the 'trick' for the **O**.

2. Tell students that you will show them how to apply the SRL strategies previously learned to a writing task. The students should be offered numerous opportunities to practice before doing it independently.

3. Based on the adventure previously read in this lesson, tell the students that the topic of the story to be modelled is: "*The Orange color was saved by his friends from the shifting sands...*". Explain them that you will be thinking out loud on how to plan the story, while they should be helping with creative ideas and details about the adventure. Try to match the students' verbal and style language, and be sure that you lead the modeling process, which is composed by the following steps:

A) Using PLEE **model**

4. Say: *"What do I have to do before start planning my story? I have to think about the materials needed, the place where I will write the composition and the time needed to complete this task, so that everything runs smoothly. To do so, I will draw a new* ***PL****EE chart and I will write down everything I need before start planning my story.*

B) Planning using POW **and S-A-C**

5. Tell your students to put everything on the top of the table (i.e., all the school materials needed) and get ready to start planning the story.

6. Say: *"Now that I have everything I need, I can start planning my story. Looking at my planning sheet, the first thing I need to do is to Pick my ideas (****P****OW), which means to think about the characters and organize the sequence of the events in my mind. I need to be creative".*

7. Next, say: *"Then I have to use the 'trick' for **O** - organize my notes".* Ask students what 'trick' it is (i.e., S-A-C). Tell them: "*I will fill in this planning sheet in order to organize my notes and write down the ideas regarding each part of the story. Writing down ideas doesn't mean writing full sentences, but just notes."* During this stage, the students should help you with ideas and answer the 6 questions of the *planning sheet*.

C) PL**E**E

8. While writing down the notes on the board, remember the importance of *monitoring*, by saying: *"While I write down my notes, I check often if everything is going on as planned".*

9. After writing all the ideas, model the assessment of the written notes. Say: *"Now that I wrote all my notes/ideas, I have to evaluate and look to see if I have accomplished what I had in mind or if I still have to add more notes/ideas to my paper".* Model adding more notes/ideas.

D) PO**W**

10. After organizing all the notes, put the *planning sheet* aside and give students a blank lined paper, while saying: *"Now, that I have finished writing all my notes, I will go for the **W** in PO**W**, which means that I will write down the story using the ideas previously planned".*

11. Model the entire process of writing a story by coping statements. Start by asking: *"What do I have to write first? Looking at the planning sheet*, *I must not forget to write the title of my story. After that, I will write my story in full sentences, including, if needed, one or two additionally ideas and vocabulary words".*

12. Continue with the modelling, recall the importance of monitoring by saying: *"While I am writing my story, I must check if I am including all the ideas previously written. I make a "checkmark" on the planning sheet after writing the idea. By doing this, I know that I am not forgetting anything. It is also important to assure that my story makes sense and that my audience will like and understand it".*

13. At last, model good ending sentences and finish by saying*: "Good work, keep it up!"*

E) PLE**E**

14. Say: "*Before sharing the story with my teacher, I will evaluate it and assess if everything went on as planned. If not, I will think about what I should do to avoid it next time."*

15. Familiarize the students with a *quality checklist* to assess their stories' scoring presence (awarded with 1 point), in-depth elaboration (awarded with 2 points), and items not included in the story (0 points). Tell the students to count the number of points and to write it on the bottom of the checklist. By doing this, students may recognize some missing parts that must be included in their next compositions. Model the evaluation of the quality of the story.

16. Return to the topic "The Orange color was saved by his friends from the shifting sands..." and encourage students to make their own plan for the story (i.e. thinking out loud about all the steps of planning the composition) and to write it as homework. Call their attention to the *tree-goal chart* and to the importance of using the *quality checklist* for evaluating the stories.

17. This session ends by reminding students that they will be asked, in the next session, about the meaning of the mnemonics. Alert them to memorize the mnemonics whenever they have time.

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Lesson 6

Purpose

The aim of this lesson is to model assessing stories (e.g. narratives previously written by students or provided by the teacher as examples) using the general and the SRL strategies. Students will be asked to identify the S-A-C steps in a narrative that will be provided by the teacher. Students are welcome to discuss each part and to add more words or sentences if needed. Following the reading of the *Cassiopeia* tale told by the Orange color in chapter 8, students will also be asked to describe and to reflect on how the colors identified each of the three phases of the SRL process (i.e., plan, execute and

evaluate) and on the SRL strategies (i.e., self-instructions, goal setting, self-assessment and self-reinforcement) applied.

Materials

The story-tool Yellow Trials and Tribulations	Student folder
Pen or pencil	Story tales
School board or chart paper	Quality checklist
Color pens or colored chalk	

Steps for the teacher to follow

Lesson 6.1 Reading of the book

Before continuing with the reading of the book, ask students about the last chapter. Then you may start with the reading of chapter 8 [Orange told his friends the myth of Cassiopeia and of Perseus connecting the adventure with the SRL strategies].

Lesson 6.2 Reflection about

Use small breaks throughout the reading of the story to check whether students are following the narrative.

Discuss with them the following sentence:

"- Perseus had a goal, planned and followed a strategy. Maybe that is the reason why he was successful".

Lesson 6.3 Practical task

1. On the basis of the chapter previously read, say: *"Perseus had a goal and followed a strategy. To achieve the goal of..., which strategy shall I use?*

- *...having strong teeth (goal), I shall...*
- *...finishing a puzzle (goal), I shall...*
- *...making my homework (goal), I shall...*
- *...being concentrated in class (goal), I shall...*

- *...writing my story (goal), I shall...*
- *...*

2. Verify if the students still remember the meaning of the mnemonics PLEE, POW, S-A-C. Recall that S-A-C is the 'trick' for the **O**.

3. Tell students to put everything on the top of the table (i.e., all the school materials needed) including the *quality checklist* to self-assess the quality of their stories.

4. Model "out loud" by assessing the S-A-C parts in a story previously written by the students, or provide new ones (e.g., Peter and the Wolf). Discuss each part of the story and add more words/ideas or sentences if needed.

5. Encourage your students to write a folktale with a moral as homework. Ask them to assess the S-A-C parts of the folktale and to add more words or sentences if needed. They may ask their parents or grandparents for help.

6. This session ends by reminding the students that they will be asked about the meaning of the mnemonics in the next session.

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Lesson 7

Purpose

The purpose of this lesson is to initiate collaborative (i.e. in students groups, within pairs of students or as a whole class activity) planning, writing and assessing of stories, using the general (i.e., POW) and SRL strategies (i.e., self-instructions, goal setting, self-assessment and self-reinforcement). Following the reading of the book chapters 9 and 10, the students will be asked to reflect about the characters' emotions and behaviors and to identify similar daily life situations. By doing this, the

students will learn to foresee and reflect about the consequences of their behavior in short- and long-term.

Materials

The story-tool Yellow Trials and Tribulations	Projector
Pen or pencil	Planning sheet
Student folder	The PLEE chart
School board or chart paper	Tree-goal chart
Color pens or colored chalk	Quality checklist

Steps for the teacher to follow

Lesson 7.1 Reading of the book

Begin with a summary of the chapter read in the previous session and start reading chapters 9 and 10 (The colors watch a picnic where the problems that commonly affect children's behavior and emotions [e.g., disobedience, lying, sulkiness, fear] are personified while discussing the best ways to de-stress children and control their behavior).

Lesson 7.2 Reflection about

Use small breaks throughout the reading of the story to check whether students are following the narrative.

Ask students to explain the following sentences/quotes:

"(...) *Even those problems that have deep roots can be defeated. It is possible to avoid problems taking care of our lives. This is not always easy to do, but it is always possible.*"

"(...) *Perhaps the most important thing is that each one of us knows their own problems and fights against them."*

Lesson 7.3 Practical task

1. To help students to better understand the emotional and behavioral components discussed on chapters 9 and 10, carry out the *"The election of the Emperor-of-Problems"* task. This task consists on asking students to reflect about the emotions and behaviors presented in the story and to identify which ones are present in their daily life. To do so, students are invited to rank each "emotional and behavioral problem" (i.e., the Lying, the Laziness, the Sulkiness, the Disobedience and the Fear) using a 5-point likert scale, where 1 indicates "a little bit present" and 5 indicates "very much present". The "emotional and behavioral problem" with the highest score will then be elected "*The Emperor-of-Problems"* of the class. Help students to reflect about their most common emotions and behaviors, to foresee their short- and long-term consequences and to propose alternative solutions, with the aim of *erasing* these "problems" from their lives.

2. Continue by saying: "*It's time to write!*" Write on a chart paper, or on the board, the mnemonics PLEE, POW and S-A-C, while testing if the students still remember their meaning.

3. Tell students to put all their materials on top of the table, including a lined paper and a new planning sheet, and ask them to choose four completely random words (e.g., blank paper, rubber, pencil case, and bird). Write those words on the board and ask students to create a story title using those words. List some interesting titles and choose collaboratively the best one.

4. Afterwards, challenge students to plan collaboratively (i.e., using the *planning sheet*) and write a story based on the selected title. Let the students lead the entire process and support them when necessary. Write down the story on the board.

5. Recall lesson 5 and help students following the steps for planning (**PL**EE**, PO**W and **S-A-C**), writing (PO**W**), monitoring (PL**E**E) and assessing (PLE**E** and *quality checklist*) of their story.

6. In the end, project the *tree-goal chart* on the wall and ask students to provide an overall assessment of their story and to set collaboratively the goal for their next story.

7. Encourage your students to plan and write a new story as homework (see topic). Call their attention to the *tree-goal chart* and to the importance of using the *quality checklist* for evaluating their story.

Topic: *Because the lazy spring didn't want to wake up, the winter decided to stay for another three months. Tell what happened in your city.*

8. This session ends by reminding the students that they will be asked about the meaning of the mnemonics in the next session.

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Lesson 8

Purpose

This lesson aims at strengthening the students' abilities for independent planning, writing and assessing of stories by using the general (i.e., POW) and the SRL strategies (i.e., self-instructions, goal setting, self-assessment and self-reinforcement). The challenge of this lesson is to wean the students off the planning sheet. During the reading of the book chapters 11 and 12, the students will be faced with the well-known tale of the '*Three Little Pigs'*, which representatively illustrates the use of the PLEE phases, the importance of self-setting goals and making the effort to accomplish such goals.

Materials

The story-tool Yellow Trials and Tribulations	The PLEE chart
Pen or pencil	Quality checklist
Student folder	Tree-goal chart
School board or chart paper	Projector
Color pens or colored chalk	Lined paper

Steps for the teacher to follow

Lesson 8.1 Reading of the book

Begin with a short summary of the chapters read in the previous session and start reading chapters 11 and 12 [In the Wood-Without-End the colors performed the story of *Three Little Pigs* for their friends. In the end, with the help of the Smiling-Eagle, the colors reflected on the SRL processes followed to perform the play].

Lesson 8.2 Reflection about

Use small breaks throughout the reading of the story to check whether students are following the narrative.

Ask students to explain the following sentences/quotes:

"'- Which traditional tale should we choose?' - asked the Red to his friends. '- The Three Little Pigs, the Three Little Pigs' - repeated the colors in chorus (...)". Ask students why do they believe the characters of the story tool chose this tale? If students do not reply continue reading the story and tell them to look for the answer in the next pages.

"*There is time for everything. First we work and then we play.*"

"- *Thank you, I enjoyed very much your act. The PLEE was very well portrayed in your play.*" Ask students what does the Smiling-Eagle mean with the last sentence, and also when the Three Little Pigs used the PLEE in the play?

Lesson 8.3 Practical task

1. Project the following *PLEE chart* on the wall. Discuss along with the students every topic.

Story of the Three Little Pigs		
Plan	Execute	Evaluate
	The first pig enjoyed more playing than working, and built a fragile house made of straw. Similarly, the second pig preferred singing, eating and playing than working, and built a fragile house made of wood.	Both houses did not resist to the wolf's blow and fell apart. The two little pigs ran very scared to their brother house asking for help.
The third pig was very busy drawing plans for his house on the floor.	He laid bricks on the top of each other in a bed of mortar between them.	His house was solid and wolf's blow proof.
	He avoided the appeal of his brothers to play, focusing on this task.	(...) *"There is time for everything, first we work and then we play".*

2. Discuss the SRL strategies presented in the story (e.g., goal setting, monitoring tasks, effort, fighting distractors, and self-assessment).

3. Then, ask students for the moral of the story.

4. Continue by saying: "*It's time to write!"* Write on the chart paper, or on the board, the mnemonics POW and S-A-C, while testing if the students still remember their meaning.

5. Tell students that from now on, they will plan their stories without the *planning sheet*.

6. Ask students to select four completely random words (e.g., house, frog, girl and Friday). Write those words on the board and ask students to create a story title using them. List some interesting titles and choose collaboratively the best one.

7. Similarly to the previous lesson, challenge your student to individually plan and write a story based on the selected title. Recall lesson 5 and help your students planning (PLEE, POW and S-A-C), writing (POW), monitoring (PLEE) and assessing (PLEE and *quality checklist*) their story.

8. When everyone is ready, tell the students to start planning their stories individually. After 5 minutes tell them to stop (they will be surprised!). Ask them to pass their planning paper to the student on their left and say: "*Now each one of you have a different story. Read it carefully and continue planning this story*". After 5 minutes, tell them to stop and ask them to pass the planning paper to the student on their left. Repeat this procedure four or five times. The students will be faced with the need for constantly applying the general and SRL strategies learned.

9. Once this task is finished, tell the students to return the planning paper to the student who started it. Then, tell them to read it carefully, to assess it using the *quality checklist* and to add more words or sentences if needed.

10. Discuss the importance of working together by doing the *Musketeers task* "*One for all and all for one*", which consists on giving examples of activities that they do together (e.g., at the playground; at home with their family; when solving a problem at school).

11. Finally, encourage your students to write the story planned during this session as homework. Call their attention to their *tree-goal chart* and to the importance of using the *quality checklist* for evaluating their story.

12. Announce students that they will be asked about the meaning of the mnemonics in the next session.

****

Lesson 9

Purpose

The purpose of this lesson is to continue strengthening the students' abilities for independent planning, writing and assessing of stories, using both general (i.e., POW) and SRL strategies (i.e., self-instructions, goal setting, self-assessment and self-reinforcement). Following the reading of the book chapters 13 and 14, the students will be firstly asked to discuss and reflect about how the characters applied the steps of the problem solving process, and secondly to put those steps into practice independently.

Materials

The story-tool Yellow Trials and Tribulations	The PLEE chart
Pen or pencil	Quality checklist
Student folder	Tree-goal chart
School board or chart paper	Projector
Color pens or colored chalk	Lined paper

Steps for the teacher to follow

Lesson 9.1 Reading of the book

Begin with a short summary of the chapters read in the previous session and start reading chapters 13 and 14 [The colors played a riddle game with the *Tree-Pirate* (a tree wearing eye patches to cover a missing part of the trunk) to get information about Yellow. The *Tree-Pirate* lost the game and the colors learned that the tree had lied. The information about Yellow was held on an old trunk protected by a hairy spider. The colors used the strategy by Perseus, tricked the spider and found the information].

Lesson 9.2 Reflection about

Use small breaks throughout the reading of the story to check whether students are following the narrative. Ask them to explain the following sentences/quotes:

"(...) *why would the Tree-Pirate lie and now say the truth? How can we trust someone who lies and doesn't keep a promise?*"

Lesson 9.3 Practical task

1. Project the following *PLEE chart* on the wall. Discuss along with the students every topic.

<table>
<tr><th colspan="5">The Tree-Pirate</th></tr>
<tr><td>Plan</td><td colspan="3">Execute</td><td>Evaluate</td></tr>
<tr><td>Blue explains how to better understand the problem.</td><td colspan="3">Blue draws a chart with the aim of solving the riddle.</td><td rowspan="2">Orange reflects about the drawing on the floor, solving the problem.</td></tr>
<tr><td colspan="4"><table>
<tr><td>Plan</td><td>Execute</td><td>Evaluate</td></tr>
<tr><td colspan="2">The colors defined the characteristics of the situation and tried to figure out how to distract the spider. Green recalled the story of Perseus fighting Medusa.</td><td>With the sun's help, the colors confused the spider.</td><td>The colors managed to get inside the trunk.</td></tr>
<tr><td>Plan</td><td>Execute</td><td>Evaluate</td><td></td></tr>
<tr><td>Perseus reflected about how to distract the Medusa.</td><td>Perseus used a shield as a mirror.</td><td>Perseus managed to reach the Medusa without getting petrified.</td><td></td></tr>
</table></td></tr>
</table>

2. After discussing the PLEE chart, start a game with your students by saying: *"Riddle, Riddle, Riddle".* Tell students riddles and ask them to solve those riddles by applying the steps of the problem solving process. Tell them to: (i) firstly, make a drawing or a chart to help you solve the riddle; (ii) write down possible alternatives and check them; (iii) and finally, make a decision.

Some examples of riddles:

- What is higher than the king? (Crown)
- I have a crown, but I'm not a king. I have roots, but I'm not a plant. I help my owner to eat, but when I have a hole I make him suffer. Who am I? (Tooth)
- The bigger it gets, the less you see? (Darkness)
- The more you take away, the bigger it gets? (Hole)

3. Continue by saying: "*It's time to write!*" Write on the chart paper or on the board, the mnemonics PLEE, POW and S-A-C, while testing if the students still remember their meaning.

4. Ask students for four completely random words and tell them to individually create a story title with those words. Each student should then independently plan, write and assess their story using the general and the SRL strategies learned. Call their attention to their *tree-goal chart* and to the importance of using the *quality checklist* for evaluating their story.

5. Recall the steps for planning (**PL**EE**, PO**W and **S-A-C**), writing (PO**W**), monitoring (PL**E**E) and assessing (PLE**E** and *quality checklist*) the story and provide extra individual help to struggling writers. Encourage students to create complete sentences and to use a diverse vocabulary. Moreover, remind your students that they may add more ideas and sentences to the story after assessing it.

6. Tell your students that they will be asked about the meaning of the mnemonics in the next session.

7. If you consider that your students are still struggling with writing, repeat this lesson, or similar ones, until you believe that they are capable of writing independently.

****

Lesson 10

Purpose

The intention of the last lesson is to review the general and SRL strategies taught throughout this instructional program and to offer students with the opportunity to reflect about their importance, not only in learning contexts (e.g., writing *good* compositions), but also in any daily life situations. Following the reading of the last book chapters (15, 16 and 17), students will be asked to reflect about how the characters had to take responsibility for their acts and about the importance of effort and commitment to accomplish their main goal (i.e., finding their friend Yellow).

Materials

The story-tool Yellow Trials and Tribulations
Pen or pencil
Student folder
Projector
Color cardboard
The PLEE chart
Tree-goal chart

Steps for the teacher to follow

Lesson 10.1 Reading of the book

Begin with a short summary of the chapters read in the previous session and start reading chapters 15, 16 and 17 [Blue and Sarabico heard a quiet and distant noise in the middle of the night, and left their friends in search of the sound hopping it could be Yellow asking for help. Eventually they found a wounded lark. When the other colors woke up, they discovered that the two friends were missing; learned the story of Hansel and Gretel and went searching for Blue and Sarabico who marked their way with small torches in the ground. With the help of a grumbling owl the colors found Blue, Sarabico and met the lark. Finally the colors found Yellow hidden inside of an egg yolk.].

Lesson 10.2 Reflection about

Use small breaks throughout the reading of the story to check whether students are following the narrative. Ask students to explain the following sentences/quotes:

"(...) *when we achieve something difficult, the joy of the conquest is bigger* (...)"

"(...) *I am not always paying attention. That's why sometimes the rehearsals seem to last forever". "We all make mistakes. The most important thing is to be able to recognize our mistakes, to apologize and to try not to make the same mistake again".*

Lesson 10.3 Practical task

1. Project the following *PLEE chart* on the wall. Discuss every topic with the students.

<table>
<tr><th colspan="3">Blue and Sarabico went looking for Yellow</th></tr>
<tr><td>Plan</td><td>Execute</td><td>Evaluate</td></tr>
<tr><td></td><td>Blue and Sarabico followed a quiet and distant noise and found a wounded lark.</td><td>Blue and Sarabico reflected about the consequences of not planning before leaving.</td></tr>
</table>

<table>
<tr><th colspan="4">The other colors went looking for Blue and Sarabico</th></tr>
<tr><td colspan="3">Plan</td><td>Execute</td><td>Evaluate</td></tr>
<tr><td colspan="3">The colors reflected about the "Hansel and Gretel" story.</td><td rowspan="3">To mark the way, Blue and Sarabico left small torches on the ground.</td><td rowspan="3">The colors were able to find Blue and Sarabico and to return without any surprises. Blue and Sarabico reflected about the consequences of not planning and the importance of taking responsibility for their own mistakes.</td></tr>
<tr><td>Plan</td><td>Execute</td><td>Evaluate</td></tr>
<tr><td>To avoid getting lost in the woods, Hansel and Gretel thought about how to mark the way back home.</td><td>They left small stones along the way.</td><td>Following the trail of stones, Hansel and Gretel managed to get safely back home.</td></tr>
<tr><td colspan="3">The colors prepared the sticks and lighted them using a campfire.</td><td></td><td></td></tr>
</table>

2. After discussing the *PLEE chart*, ask students to give examples of impulsive and inappropriate behaviors and ask them to reflect about the consequences of their acts (e.g., answering without thinking; hitting other students to play with their toy; go after something or someone without telling anyone and get lost).

3. At last, question students about "*The Yellow's mystery*", why it went away and how it got inside the egg [the colors found that Yellow was hidden in the egg yolk]. List some interesting suggestions and discuss them. Additionally, repeat this task by asking students for alternative endings for this story. Address the moral of the "*Yellow Trials and Tribulations*" story-tool by asking students what they have learned with this story.

4. Celebrate with your students the ending of the instructional program and tell them that they all did a great work. Go quickly through their written stories once again, and ask them to reflect about their achievements, namely about the accomplishment of their self-settled goals. Make a goal achievement party and congratulate students for their achievements.

5. The last activity consists on summarizing the contents taught along the instructional program. Divide your students into small groups and ask them to prepare a color cardboard or a PowerPoint presentation where they should present all the "tricks" and strategies learned. Recall your students that they should apply the PLEE phases to perform this task.

The End

****

3.3 References

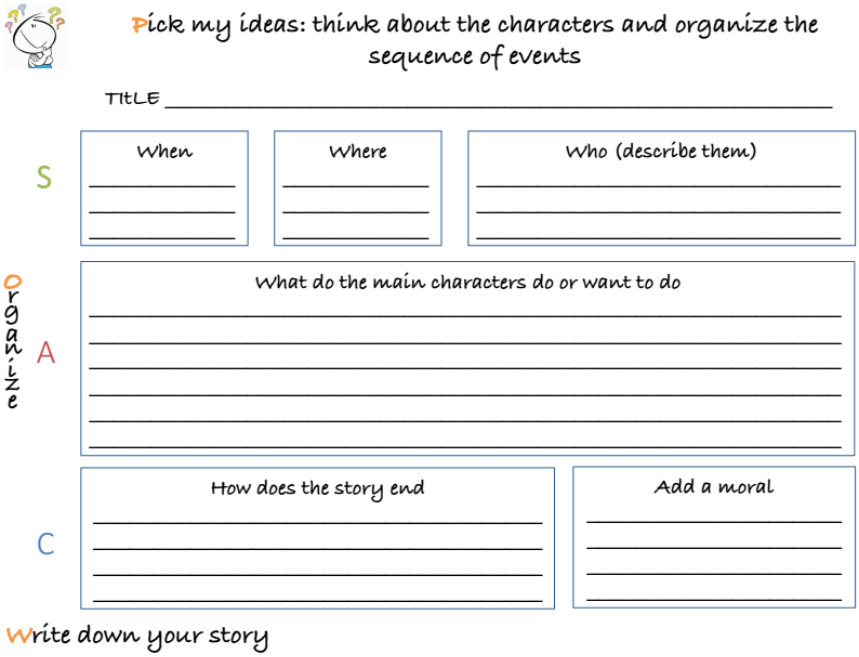
Graham, S., & Harris, K. R. (2003). Students with learning disabilities and the process of writing: A meta-analysis of SRSD studies. In H. L. Swanson, K. R. Harris, & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 323–344). New York: Guilford Press.

Núñez, J.C., Rosário, P., Vallejo, G., & González-Pienda, J.A. (2013). A longitudinal assessment of the effectiveness of a school-based mentoring program in middle school. *Contemporary Educational Psychology, 38,* 11-21. doi:10.1016/j.cedpsych.2012.10.002

Rosário, P., Núñez, J.C., & González-Pienda, J.A. (2007). *Sarilhos do Amarelo*. Porto: [*Yellow's trials and tribulations*]. Porto: Porto Editora.

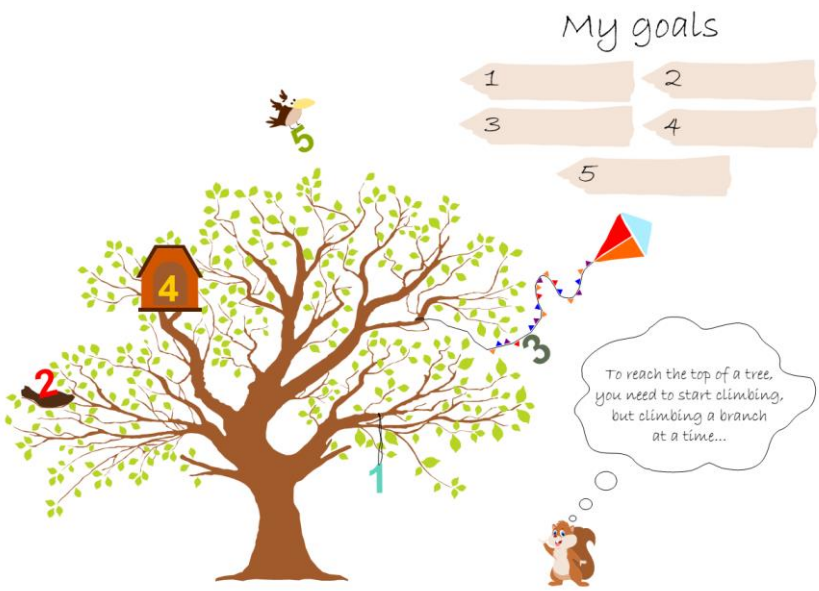
3.4 Appendix A

Planning sheet with general writing strategies (i.e., POW, *P*ick my ideas, *O*rganize my notes, *W*rite and say moral).



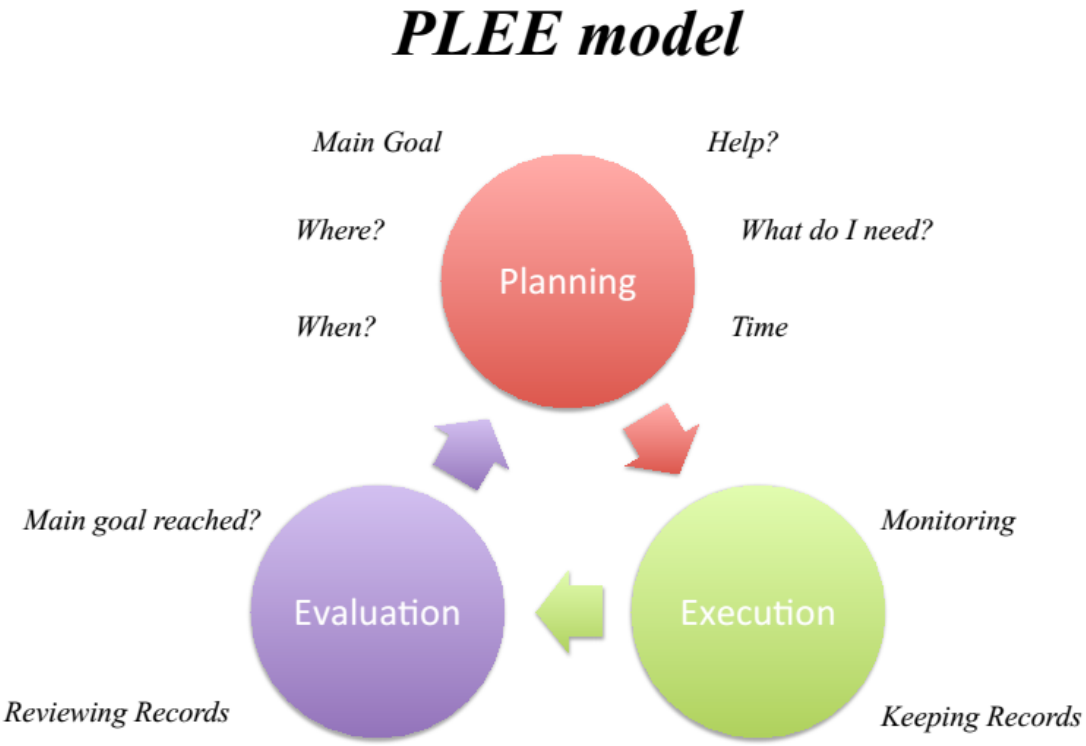
3.5 Appendix B

Tree-goal chart



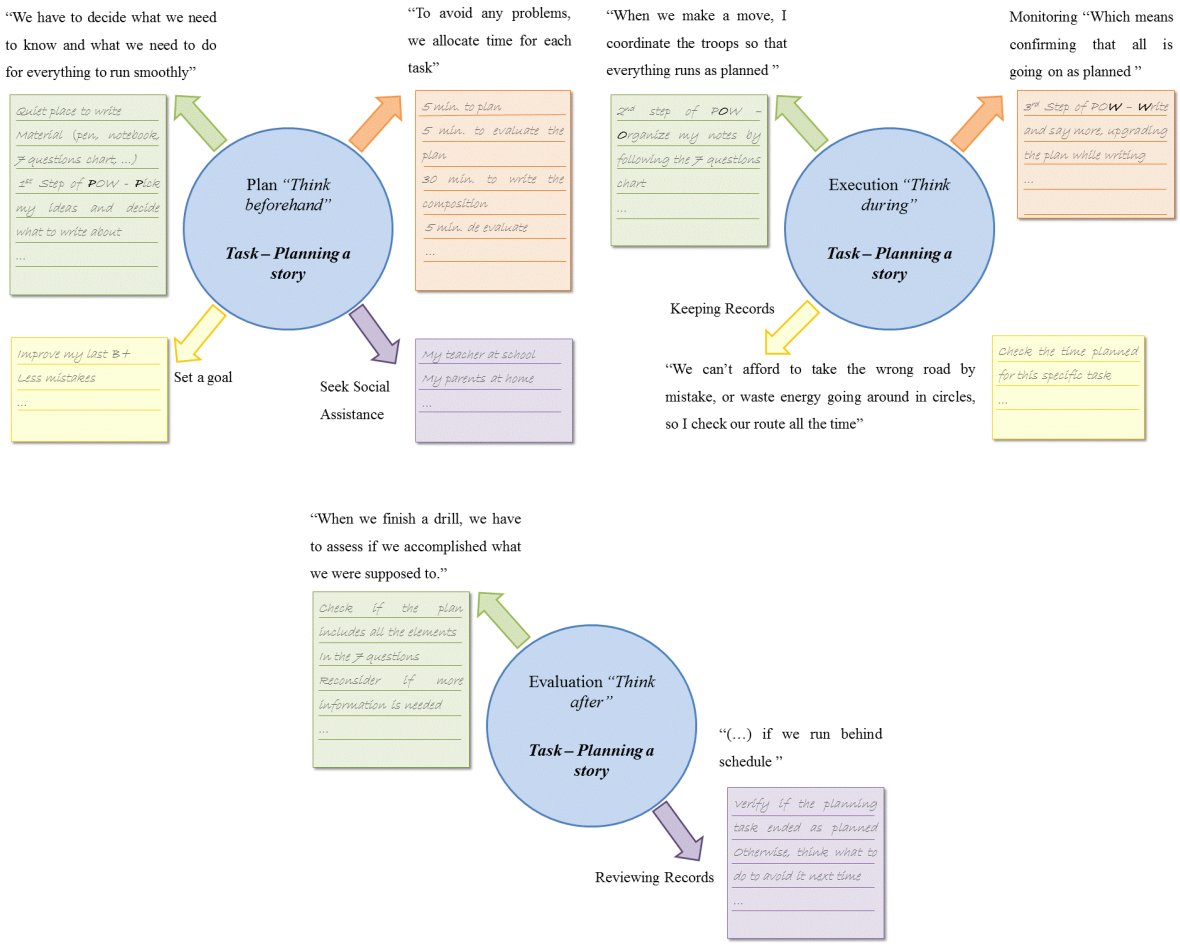
3.6 Appendix C

Schematic representation of the PLEE model



3.7 Appendix D

Schematic representation of the PLEE chart. Brief examples of how to *Plan* "*Think beforehand*", *Execute* "*Think during*" and *Evaluation* "*Think after*".



4. WRITING WEEK-JOURNALS TO IMPROVE THE WRITING QUALITY OF FOURTH-GRADERS' COMPOSITIONS

Rosário, P., Högemann, J., Nuñez, J. C., & Vallejo, G., Cunha, J., & Oliveira, V. (submitted). Writing week-journals to improve the writing quality of fourth-graders' compositions. *Journal of Educational Psychology*.

4.1 Introduction

Writing is an important tool for daily life and learning activities, still a considerable number of students struggle when writing. According to the National Center for Education Statistics (2012) approximately two-thirds of the American students do not meet grade-level expectations in writing skills. In response to this educational worrying scenario, several school-based interventions were conducted to improve students' writing quality (e.g., De La Paz & Graham, 2002; Glaser & Brunstein, 2007; Fidalgo, Torrance, & Robledo, 2011; Harris, Graham, & Adkins, 2015). However, this type of instructional programs may be an unaffordable expense for schools and parents (Education Endowment Foundation, EEF, 2014). For this reason, it is important to find alternative but still effective writing practices that may help students overcome their poor writing performance. Writing journals is a tool suited to answer this educational challenge and may be easily used in class (e.g., Gomez, Parker, Lara-Alecio, & Gomez, 1996). Notwithstanding its potential in promoting writing, the effectiveness of this writing activity has not yet been extensively examined to draw consistent conclusions (see, Gomez et al., 1996; Graham & Perin, 2007; Hillocks, 1986).

To address this call, our study examined the effectiveness of writing week-journals to enhance 4th graders' quality compositions. The analysis of the impact of week-journals focusing real-life events (e.g., school or at home focused) on the writing quality following a controlled design may help to deep our understanding on the added value of the week-journals. Hence, the current study followed a longitudinal cluster-randomized controlled design along twelve weeks. We examined whether students' writing quality differed when writing journals on a weekly basis for 12 weeks, compared with a treatment comparison group.

4.1.1 Writing at the elementary school

Young children start to write by making drawings and random scribbles on a paper. Later, in the elementary school, children learn how to transform these random scribbles into letters, and to spell correctly words and sentences (Bruning & Horn, 2000). From these early stages, writing plays an important role in the quality of students learning (Applebee, 1984; Bangert-Drowns, Hurley, & Wilkinson, 2004; Langer & Applebee, 1987; Graham & Perin, 2007) and on enhancing children personal development (Graham, 2006; Harris, Graham, Brindle, & Sandmel, 2009; Prior, 2006).

Extant research and educators all over the world alert to the fact that students who struggle with writing are in clear disadvantage in today's world (Graham, 2006; Harris et al., 2015), especially those attending classes where writing assumes a crucial role in achieving success (Graham, 2006). Research has shown that effective writing instruction assisting struggling young writers before difficulties become entrenched is likely to produce positive instructional effects (Graham & Harris, 2005). A preventive approach fostering students writing development might mitigate later writing problems as a result of poor instruction (Graham & Harris, 2002; Graham, Harris, & Larsen, 2001) or limited practice (Galbraith & Rujlaarsdam, 1999) and may enhance students' engagement and motivation to write (Applebee, 2000; Braddock & Jones, 1969; Lo & Hyland, 2007). As discussed by Cutler and Graham (2008), based on a survey conducted in the United States with 174 elementary school teachers, only 50% reported to provide students with a set of writing practices throughout the school year (e.g., drawing images and write about it, writing letters, story writing and completing a worksheet).

Moreover, to prevent writing difficulties at elementary school, students should enroll in early writing instruction to practice the use of self-regulated learning (SRL) strategies and promote a positive attitude towards writing (Boscolo, 2008). In fact, lacking SRL competences forecast future problems at school (Núñez, Rosário, Vallejo, & González-Pienda, 2013). Previous studies on writing competencies (e.g., Bereiter & Scardamalia, 1987; Flower & Hayes, 1981) have shown that students receiving training in SRL strategies (e.g., goal setting; time management; generating and organizing ideas; planning, drafting, revising and, simultaneously self-monitor their performance), when compared with those who did not received this intentional training, are more likely to produce texts with more quality (e.g., Flower & Hayes, 1981; Bereiter & Scardemalia, 1987; Glaser & Brunstein, 2007) and to engage deeply in school tasks and show higher academic achievement (Rosário, González-Pienda et al., 2010).

Furthermore, students' attitude towards writing plays, as well, an important role in predicting writing performance (Graham, Berninger, & Abbott, 2012; Graham, Berninger, & Fan, 2007). Students'

showing a positive attitude towards writing are likely to write often and to put on effort when writing. In turn, students with a less positive attitude towards writing are likely to display low effort in their writing, avoiding this type of task whenever it is possible (Graham et al., 2007). Therefore, when students perceive themselves more self-efficacious in writing, they are more likely to show signs of good writing quality and invest more effort while carrying out a writing task (Graham et al., 2007; Pajares & Valiente, 2006; Pajares, Valiante, & Cheong, 2007).

4.1.2 The benefits of writing journals

In the last decade, several studies have been conducted to assess particular conditions that can make writing more meaningful an enjoyable for learners (Boscolo & Gelati, 2007; Hidi, Berndorff, & Ainley, 2002; Miller, 2003). For example, writing about an interesting topic (Hidi & McLaren, 1991) and writing frequently using a particular genre (Saddler, Moran, Graham, & Harris, 2004; Troia & Graham, 2002) were found to increase student's motivation. Besides, prior investigation found that providing students with multiple opportunities to express themselves through writing is likely to increase their motivation and engagement in writing (Applebee, 2000; Braddock & Jones, 1969; Lo & Hyland, 2007). Still, these activities should be prescribed regularly (i.e., as homework or at school) and students should be encouraged to enroll in such tasks (Perry & VandeKamp, 2000).

Among the activities likely to promote writing, journal writing has been gaining popularity (Tynjälä, 2001). In general, journal writing is an informal and personal writing (Tynjälä, 2001) used to write about a desired topic, without restrictions or grading purposes (Hillocks, 1986). Journal writing foster students "sense of authorship" (Raphael, Englert, & Kirschner, 1986, p. 7) by allowing students the freedom to write on their own. For example, a study by Jones and East (2010) at elementary school found that writing a daily-journal enhanced students' writing confidence and control over the written language. Extant research reports that journal writing have been used for purposes, such as, (i) engage students in writing (Boekaerts & Corno, 2005; Galbraith & Rijlaarsdam, 1999), (ii) encourage them to openly express their ideas on the paper (Hillocks, 1986; Tynjälä, 2001); (iii) increase writing skills (Hillocks, 1986) by helping students to select and manage topics to write about (e.g., Graves, 1981; Murray, 1978), (iv) enhance creativity and interesting ways of writing (Hillocks, 1986), and (v) enhance students' learning (Bound, 2001), reflection, critical thinking, self-expression, self-regulated skills and knowledge (Tynjälä, 2001).

4.1.3 The present study

Students' writing problems are a global educational concern in need of particular attention. For example, in the last 30 years the USA introduced several educational reforms focusing the teaching of writing in schools (Applebee & Langer, 2011) to circumvent students poor school results (National Assessment of Educational Progress, 2002). In Portugal, schools have been neglecting the teaching of writing in the last decades, still relevant reforms have been recently introduced in the Portuguese curriculum (OECD, 2013) aiming at promoting writing skills, the writing quality (e.g., grammar, spelling, sentence construction) and the organization of the text (Festas et al., 2015). Portuguese data indicates that fourth graders' difficulties in writing are more severe than those of math and reading (Portuguese Ministry of Education and Science, 2013a) and, also that students difficulties in writing are likely to persist throughout schooling until college (Carvalho & Pimenta, 2005).

Despite, the importance of writing to progress in learning, to our knowledge, there is limited studies on the impact of providing extra writing opportunities (i.e., writing journals) in the writing quality of compositions. Prior studies have examined the impact of free writing in writing quality, still no consistent evidence has been found (e.g., Arthur, 1981; Gomez et al., 1996; Hillocks, 1986; Wienke, 1981). For example, Applebee (2000) and Lo and Hyland (2007) observed that increasing the frequency and the amount of writing tasks is expected to enhance students' engagement and writing quality, but no evidence supporting this relationship has been found (Graham & Perin, 2007).

To address this goal we followed a longitudinal cluster-randomized controlled design. For along twelve weeks we examined whether students' writing quality differed when writing week-journals (treatment group) compared with a comparison group.

Participating classes were randomly assigned to an experimental or a comparison treatment condition. Fourth grade students in classes enrolled in the experimental condition did an extra writing activity on a weekly basis (i.e., weekly journals), while students in the comparison condition did not.

In the current study, we hypothesized that:

1. There are significant differences in the quality of writing between students in classes doing week-journals and students in classes who did not do that extra writing activity.
2. There are significant differences in the quality of writing in function of the quality of the week-journals.

4.2 Method

4.2.1 Participants and design

Our study focused on the fourth grade. Fourth grade was selected because it is the final grade level of elementary school in the Portuguese educational system, and students complete a national standardized exam in Portuguese Language at the end of the school year, which counts for 30% of the students' overall Language grade.

This research was conducted in 10 public schools in the north of Portugal, and enrolled 10 teachers and their students (classes) which were randomly assigned to one of the two treatment conditions: experimental and comparison. Finally, five classes participated in the experimental condition (40 girls and 50 boys) and five in the comparison one (48 girls and 44 boys). All the participating teachers were female holding and undergraduate degree with ages ranging between 34-56 years. Their teaching experience ranged between 23 and 34 years (M= 27; SD=3.85) in the experimental group, and between 12 and 20 years (M=16; SD=3.63) in the comparison group. The participating students were 182 (88 girls) fourth graders. Their ages ranged from 9 to 10 years (M= 9.5; SD = 0.51), and Portuguese was their primary language. Class sizes ranged between 10 and 21 in the experimental group and between 14 and 23 students in the comparison group.

4.2.2 Procedure

After obtaining consent from the Portuguese Ministry of Education, the research team contacted 16 public schools in the northern part of Portugal, ten agreed to participate. In these schools, the families of all students are globally lower-middle classes because of the high percentage of students (approximately 42%) who received free or reduced-price lunches. These demographic data were collected from the offices of the participating schools.

Next, all the eighteen 4th-grade teachers from the enrolled schools were invited to participate in the research through an email that explained the overall study objectives. Eleven teachers (a response rate of 61%) communicated their intention to participate via email. Then, a total of 182 students' parents from the enrolled were informed about the study aims and procedures through a letter and were asked for permission for their child's participation. All students returned signed parental consent forms. Participation was voluntary for teachers and students, and participants' confidentiality and

anonymity were assured (e.g., eliminating the names and researchers' personal notes that could link the participants to their teachers or schools). Finally, the 10 teachers (classes) who agreed to participate (with their students) were randomly assigned to the two treatment conditions (i.e., experimental and comparison group). In both conditions, teachers agreed to follow the traditional writing curriculum for fourth graders (e.g., teaching grammar, organization of text, a variety of text genres) along the duration of the study.

Two weeks prior to the beginning of the study, teachers from both conditions participated on a training course with two modules. The first module comprised 9 hours spread over 3 days and was delivered by the research team. The content of the training sessions included the presentation of the study and discussion of the general framework (e.g., genre of the compositions, type of week-journals, protocol to administrate the questionnaires) and the assessment measures (e.g., rating scale to assess the quality of the compositions). In addition, teachers participated on a second module of the training with 8h spread over 4-days. In those sessions teachers worked collaboratively with researchers and assistant researchers (i.e., eleven pre-service teachers) on the assessment of the overall quality of the children compositions. The training on how to use the rating scale (see measures) followed a hands-on approach. Teachers selected a set of compositions made by their students on the third grade, and switched those compositions with their colleagues and assistant researchers on a random basis. Each composition was assessed by a teacher and a research assistant, who worked independently to assess the overall quality of the composition using the rating scale. After scoring the composition, the pair discussed scores to reach a consensus. To ensure reliability of the assessment process, teachers assessed 8 compositions over the four days, each time with a different research assistant. Kappa value was calculated using the Coder Comparison Queries in the Navigation View of the NVivo software. In the end of the fourth day the Kappa value of the 11 dyads ranged between .80 and .86 (M=.82; SD=.017) which can be labeled as "almost perfect" according to Landis and Koch (1977, p. 165). In the final training session, a timetable with the dyads (i.e., teacher and a randomly assigned research assistant) scoring the compositions was distributed. The compositions were done in class each Monday, and a copy of the compositions was delivered to research assistants as soon as possible. Each composition was assessed individually and every Thursday after school, along 12 weeks, the dyads met to find consensus on the scores given. Finally, the graded compositions were delivered to students each Friday.

Five weeks post-intervention, the teachers attended a two-hour evaluation meeting to analyze their experiences while participating (e.g., comments and suggestions that could help in future research) and discuss preliminary data (see, Rosário, Núñez, Vallejo, Cunha, Nunes, Mourão et al., 2015; Rosário, Núñez, Vallejo, Cunha, Nunes, Suárez et al., 2015).

In this meeting, all participant teachers from both groups declared that, as agreed, to have followed the national writing curriculum along the duration of the study. The preparation for the national exam was declared as the important focus of instruction. Teachers referred to have spent time in class teaching grammar, punctuation and working other types of genres than narrative required to meet fourth grade level expectations.

Teachers who fully participated in the research were offered a 27 hour (1 ECTS) training course about learning and instruction processes that was conducted at the University (Universidade do Minho).

Specific intervention procedures

For 12 weeks, every Friday afternoon students were asked to fill in questionnaires to access SRL strategies in writing, attitude towards writing and self-efficacy. These instruments were administrated in class by the research assistants and lasted approximately 25 minutes. Besides, every Monday morning during regular Portuguese language class, all students from both conditions wrote a composition with a topic in 45 minutes (see Figure 4.1). The composition topic (e.g., *Describe the adventures of the gray pencil, who went out of its case and initiated an adventure around the world. He colored in gray everything he found on his way, without thinking about the consequences, until...*) was sent by email to all teachers each Sunday evening. During the week students were not asked by teachers to do any other composition.

Additionally, each Friday morning during the 12 weeks of the intervention, students at the experimental condition wrote a week-journal in 25 minutes. Prior to the beginning of the study these students were told by the research assistants that the week-journals were only for research purposes and their teachers would not read them. Moreover, each student received a notebook "journal" to write their weekly entries. Journals were kept in the classroom in a closed box under the responsibility of a research assistant. Each Friday morning students at the experimental group were expected to write a new entry in the journal (i.e., approximately with ten lines) about their week events at school or at home.

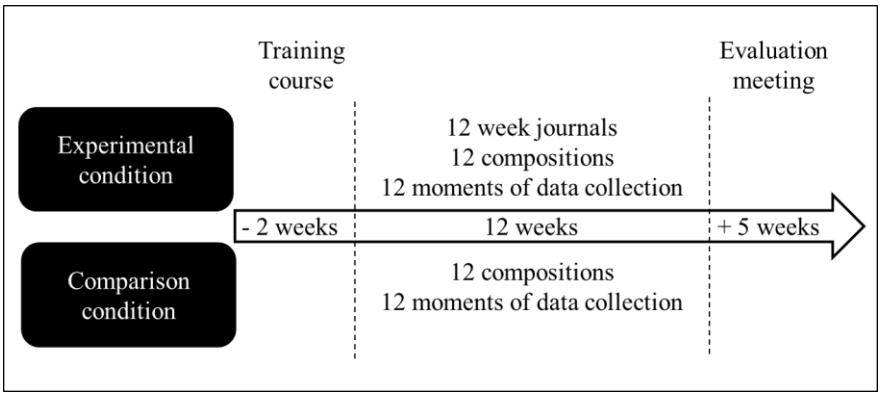


Figure 4.1. Description of each treatment condition pathway throughout the intervention.

4.2.3 Instruments and measures

Self-regulated learning strategies inventory

The original students' SRL Strategies Inventory developed by Núñez et al. (2013) assesses nine self-regulated learning strategies concerning the three phases of the SRL process (i.e., planning, execution and evaluation). In the preset study, this scale was adapted with the aim of assessing the SRL strategies used while writing: *Planning* (i.e., ''I make a plan before I begin writing. I think about what I want to say and how I need to write it''), *Execution* (i.e., While I write my composition I follow my plan", and *Evaluation* (i.e., ''I compare the grades I received with the goals I set for that subject.''). The 9-items were scored on a 5-point *Likert* scale, ranging from 1 (never) to 5 (always). Cronbach's alpha in this study was .80.

Attitude towards writing

Each of the 9 items from the writing attitude survey (Graham et al., 2007) asked students to indicate how they felt when they engaged in writing activities at school or at home (e.g., *How do you feel when you think you have to write instead of being able to play?)*. Students were asked to mark one of the four images of Garfield the Cat on a 4-point *Likert* scale (1 = very unhappy; 4 = very happy). This scale was, in the present study, translated and adapted to the Portuguese population. Cronbach's alpha in this study was .86.

Self-efficacy beliefs

To assess students' self-efficacy for planning and writing a story, we followed the five-items used by Graham, Harris and Mason (2005). An example of an item was *"When writing a paper, I have trouble finding the right words for what I want to say".* The five-items were scored on a 4-point *Likert* scale (1 = strongly disagree; 4 =strongly agree). This scale was translated and adapted to the Portuguese population. Cronbach's alpha in this study was .71.

Writing performance

1. Compositions

In order to assess the writing quality of students' compositions, a holistic rating scale was used based on the criteria defined in the Educational Progress Test (i.e., a standardized exam) in Portuguese language for fourth graders (Ministry of Education and Science, 2013b). The rating scale assesses topics such as (i) title; (ii) organization (introduction, main body paragraph, ending), (iii) grammatical correctness of sentences (e.g., active verbs, use of direct speech, descriptive adjectives, punctuation, morphology) (iv) coherence; (v) originality; (vi) sentence structure, (vii) word choice; (viii) spelling errors. Teachers were asked to read first the paper to obtain a general impression of overall writing quality. Prior scoring, all narratives were typed into a Word document and the number of words was counted. Students' personal information was removed and punctuation, spelling and capitalization were corrected to minimize bias that might influence the scoring process as suggested by the literature (e.g., Graham et al., 2007). Compositions were then scored on fourteen 5-point *Likert* scales (1 = low quality; 5 = highly quality), ranging from 0 to 65 points. All compositions from the same class were scored independently by a dyad (teacher-research assistant) using the mentioned rating scale. Each dyad met every week to find a consensus about the grades for each composition as previously stated (see procedures subsection). Moreover, before writing the next composition, students received their compositions rated for each topic assessed and a final score.

2. Journals

Feedback on the week-journals was not provided. In the end of the study four new research assistants, unfamiliar with the design of the study, assessed all journals quality using the same holistic rating scale. Each journal was assessed by two research assistants independently, and followed the same procedures presented above (i.e., all journals were typed into a Word document; students'

personal information was removed; punctuation, spelling and capitalization were corrected; each journal was scored using the rating scale, each dyad met to find consensus on the grade).

Prior achievement

Prior achievement in Portuguese language was obtained from students' final grades in the third grade collected in the schools' secretariat. In Portuguese compulsory education, grades are 1 and 2 (negative), 3 (passing), 4 (good), and 5 (excellent).

4.2.4 Design and data analysis

This research followed a longitudinal cluster-randomized controlled design to examine whether the quality of the compositions (*Comp*) of the students who wrote week-journals for twelve weeks differed from that obtained by students who did not write week-journals (comparison group). In cluster randomized trials, groups of individuals (rather than individuals themselves) are randomly assigned to experimental conditions, and individuals from the same clusters are measured over time. There are a number of options to analyse data with this kind of design and no universally best approach exists. Still, several authors, including Vallejo, Fernández, Livacic-Rojas and Tuero-Herrero (2011), propose likelihood-based mixed-effects regression models to analyse incomplete data from longitudinal cluster randomized trials. This approach provides an appropriate general analytic framework to determine whether the change in response profiles over time is different among the treatment groups. In the analysis of growth curve model, the variable time was regarded as a continuous (i.e., quantitative) rather than a classification variable (i.e., qualitative).

Considering the hierarchical nature of data a three-level hierarchical model was conducted. To avoid the enumeration of all the possible models, a data-driven strategy for selecting the best model by computing deviance difference was used. Figure 4.2 plots the mean response over time for the experimental and comparison groups. As reported, the comparison group displays little change over time while the experimental group appears to exhibit some type of curvilinear form. Because visual examination suggests that the relationship displayed in Figure 4.2, on average, may be nonlinear, we fitted a quadratic growth model.

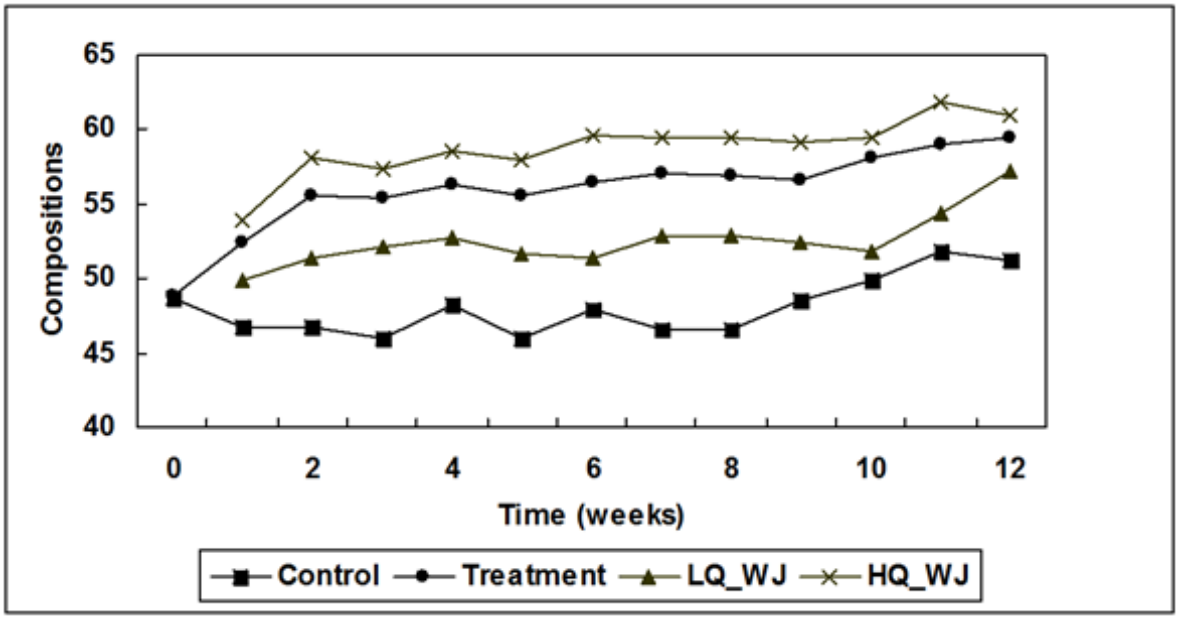


Figure 4.2. Plots the mean response over time for the treatment and comparison groups. Compositions is the dependent variable. Control and Treatment are the two levels of the independent variable. LQ_WJ (low quality week-journals) and HQ_WJ (high quality week-journals) are two subgroups of the treatment group (divided according to the writing quality of the journals).

To begin, the compositions outcome (Comp) at time *t* for student *i* in class *j* is modelled at level 1 by

$$\mathrm{Comp}_{tij} = p_{0ij} + p_{1ij}\,\mathrm{TIME}_{tij} + p_{2ij}\,\mathrm{TIME}^2_{tij} + p_{2ij}\,\mathrm{SE\_W}_{tij} + p_{4ij}\,\mathrm{SR\_W}_{tij} + p_{5ij}\,\mathrm{AT\_W}_{tij} + \mathrm{e}_{tij},$$

where π_{0ij} is the expected outcome for student *ij* at the week 6, where 6 is the mean of {0, 1, 2,..., 12}, π_{1ij} is rate of change in the *Comp* for student *ij* at week 6 (in our study the average rate of change during the data collection period), π_{2ij} is the quadratic change in the *Comp* for student *ij* (i.e., represents the rate of acceleration regardless of the choice of location for level-1 predictors), π_{3ij} is the student's change in *Comp* due to self-efficacy for writing (*SE_W*), π_{4ij} is change in *C* due to self-regulation in writing (*SR_W*), π_{5ij} is change in *Comp* due to attitude toward writing (*AT_W*), and e_{tij} represents a residual.

The number of classes is low, still the results of a preliminary analysis suggested considerable random variation and intercept and slope at both levels 2 and 3. The results also suggested to retain time-variant covariates or predictors (i.e., *SE_W*, *SR_W* and *AT_W*) in the level-1 model but treat them

as fixed at level-2 and at level-3. To correctly interpret the model parameters it is important to note that all time-varying predictors entered into the model centred at its mean.

At level-2, individual differences in the random coefficients from level 1 (i.e., π_{0ij}, π_{1ij}, π_{2ij}) were modelled as a function of student's gender (girl = 0, boy = 1; *GEN*), baseline age in years (*AGE*) and prior achievement (not very well = 1, to very well = 5; MSE; *P_ACHIEV*). The *P_ACHIEV* predictor was entered into the model centred at its mean. Specifically, the following level-2 model was formulated as follows

$$\pi_{0ij} = \beta_{00j} + \beta_{01j} GEN_{ij} + \beta_{02j} AGE_{ij} + \beta_{03j} P\_ACHIEV_{ij} + r_{0ij},$$
$$\pi_{1ij} = \beta_{10j} + r_{1ij},$$
$$\pi_{2ij} = \beta_{20j} + r_{2ij},$$
$$\pi_{3ij} = \beta_{30j}, \pi_{4ij} = \beta_{40j}, \pi_{5ij} = \beta_{50j}.$$

Here, β_{00j} represents the average *Comp* level within class *j* at week 6, β_{01j} indicates whether boys and girls do differ in average *Comp* within class *j* after controlling for prior achievement and baseline age, β_{02j} represents the differentiating effect of age in average *Comp* within class *j* after controlling for gender and prior achievement, and β_{03j} represents the differentiating effect of previous achievement in average *Comp* within class *j* after controlling for gender and age at baseline. In addition, r_{0ij} indicate whether students nested within class *j* differed in their expected outcome at week 6, r_{1ij} indicate whether students nested within class *j* differed significantly in their rate of change at week 6, r_{2ij} indicate whether students nested within class *j* differed significantly in their rate of deceleration. Note that the interpretation of the quadratic coefficient does not depend of centring for time.

Next, we explored whether students nested within classes writing week-journals during 12 weeks began at a different level, or progressed over time at different rate of growth and acceleration, than those who did not wrote journals. Thus, the level-3 model incorporated the treatment (*TREAT*), the explanatory variable of major interest in the current research. This model is defined by

$$\beta_{00j} = \gamma_{000} + \gamma_{001} TREAT_j + u_{00j}$$
$$\beta_{10j} = \gamma_{100} + \gamma_{101} TREAT_j + u_{10j},$$
$$\beta_{20j} = \gamma_{200} + \gamma_{201} TREAT_j + u_{20j},$$
$$\beta_{30j} = \gamma_{300,} \beta_{40j} = \gamma_{400,} \beta_{50j} = \gamma_{500},$$
$$\beta_{01j} = \gamma_{010,} \beta_{02j} = \gamma_{020,} \beta_{03j} = \gamma_{030}$$

where $TREAT_j$ = 1 if the jth class was assigned to treatment, and $TREAT_j$ = 0 otherwise. In this model, γ_{000} is the overall mean intercept in the control group at week 6, γ_{001} is the treatment group difference in the mean response at week 6, γ_{100} is the mean slope, or rate of change in the mean response over time in the control group, γ_{101} is treatment group difference in the mean slope or rate of change in the mean response over time, γ_{200} is the rate of acceleration in the mean response over time in the control group (a measure of the upward or downward curve), γ_{2001} is treatment group difference in the rate of acceleration in the mean response over time, and u_{00j}, u_{10j} and u_{20j} are the level 3 residuals allowing class j's subjects to deviate from population averages.

By substitution, a single regression equation for the three-level growth model is given by

$$\begin{aligned}\mathrm{Comp}_{tij} = {} & g_{000} + g_{001}\,\mathrm{TREAT}_j + g_{010}\,\mathrm{GEN}_{ij} + g_{020}\,\mathrm{AGE}_{ij} + \\ & g_{030}\,\mathrm{P\_ACHIEV}_{ij} + g_{100}\,\mathrm{TIME}_{tij} + g_{200}\,\mathrm{AE\_W}_{tij} + g_{300}\,\mathrm{AR\_W}_{tij} + \\ & g_{400}\,\mathrm{AT\_W}_{tij} + g_{101}\,\mathrm{TREAT}_j'\ \mathrm{TIME}_{tij} + g_{200}\,\mathrm{TIME}^2_{tij} + \\ & g_{201}\,\mathrm{TREAT}_j'\ \mathrm{TIME}^2_{tij} + \mathrm{u}_{00j} + \mathrm{r}_{0ij} + \mathrm{u}_{10j}\mathrm{TIME}_{tij} + \\ & \mathrm{r}_{1ij}\mathrm{TIME}_{tij} + \mathrm{u}_{20j}\mathrm{TIME}^2_{tij} + \mathrm{r}_{2ij}\mathrm{TIME}^2_{tij} + \mathrm{e}_{tij}.\end{aligned}$$

which illustrates that the compositions outcome (*Comp)* may be viewed as a function of the overall intercept (γ_{000}), the main effects of the intervention $TREAT\,(\gamma_{001})$, the main effect of student's $GEN\,(\gamma_{010})$, the main effect of student's $AGE\,(\gamma_{020})$, the main effect of student's $P\_ACHIEV\,(\gamma_{030})$, the main effect of linear time trend $TIME\,(\gamma_{100})$, the main effect of quadratic time trend $TIME^2\,(\gamma_{200})$, the main effect of self-efficacy for writing $AE\_W\,(\gamma_{300})$, the main effect of regulation in writing $AR\_W\,(\gamma_{400})$, the main effect of attitude toward writing $AT\_W\,(\gamma_{500})$ and two cross-level interactions involving $TREAT$ with $TIME\,(\gamma_{101})$ and $TREAT$ with $TIME^2\,(\gamma_{201})$, plus a random error: $(u_{10j} + r_{1ij}) \times TIME_{tij} + \ (u_{20j} + r_{2ij}) \times TIME^2{}_{tij} + u_{00j} + r_{0ij} + e_{tij}$. The variables u_{00j}, u_{10j} and u_{20j} are random class effects associated with intercept, linear time slope, and quadratic time slope, respectively; r_{0ij}, r_{1ij} and r_{2ij} are random effects for clustering of students within classes associated with intercept, linear time slope, and quadratic time slope, respectively; and e_{tij} represents a residual.

Consistent with common practice in multilevel modeling, we assumed that the random effects associated with classes are independent of the random effects associated with students nested within

classes, and that all random effects are independent of the level 1 random component. It was also assumed that the residuals are normally distributed with zero means and uncorrelated with respective right-hand covariates. Multilevel analyses were conducted by fitting a variance components structure with parameters estimated by the full maximum likelihood (ML) estimation as implemented in PROC MIXED of SAS/STAT® 9.4 (2013).

4.3 Results

4.3.1 Descriptive analyses

Before analyzing data, we examined the distribution of the data of the different samples for the outcome variable and time-dependent covariates (i.e., *SE_W*, *SRL_W* and *AT_W*). The extent of the weekly variations of skewness and kurtosis for the variables included in the model, as well as the means and standard deviations are presented in Table 4.1. As shown in this table, the skewness values are globally within the range (i.e., $\pm$ 1) of what is considered a reasonable approximation to the normal curve. Analyzing the kurtosis, it is necessary to note that depending on the time in which measurements were collected the variables are very slightly platykurtic (i.e., its peak is just a bit shallower than the peak of a normal distribution) or very slightly leptokurtic (i.e., its central peak is just a bit higher than the peak of a normal distribution). As a result, it can be concluded that considering all the time periods the values for skewness and kurtosis remained within allowable limits, hence we proceed with the analysis.

Table 4.1 *Descriptive statistics of writing compositions and time-varying covariates across time*

						Week							
Comp _W	0	1	2	3	4	5	6	7	8	9	10	11	12
N	182	181	181	179	182	182	181	181	182	182	181	182	180
M	49.54	49.30	51.64	50.73	52.46	51.08	52.13	51.74	51.73	52.22	53.88	56.16	55.33
SD	5.10	6.68	8.30	7.92	7.87	8.76	8.59	8.45	8.44	8.64	7.52	8.42	7.54
SK	-0.73	-0.54	-0.15	-0.66	-0.28	-0.45	-0.21	-0.26	-0.26	-0.26	-0.40	-0.39	-0.67
KUR	0.99	0.44	-0.43	0.38	-0.56	-0.45	-0.83	-0.97	-0.97	-0.76	-0.33	-0.41	-0.04
						Week							
SE_W	0	1	2	3	4	5	6	7	8	9	10	11	12
N	182	181	181	179	182	182	181	181	182	182	181	182	180
M	2.35	2.28	2.28	2.35	2.31	2.36	2.35	2.39	2.41	2.43	2.40	2.44	2.47
SD	0.43	0.45	0.37	0.47	0.49	0.50	0.47	0.50	0.48	0.55	0.51	0.53	0.57
SK	0.30	0.00	0.63	0.46	0.39	0.08	0.10	0.28	0.15	0.28	0.30	0.31	0.46
KUR	0.19	0.20	0.14	0.22	0.24	0.25	0.22	0.25	0.23	0.30	0.26	0.29	0.32

	Week												
SRL_W	0	1	2	3	4	5	6	7	8	9	10	11	12
N	182	181	181	179	182	182	181	181	182	182	181	182	180
M	3.84	3.88	4.01	4.07	4.11	4.08	4.10	4.09	4.07	4.09	4.03	4.04	4.06
SD	0.61	0.70	0.76	0.78	0.80	0.84	0.77	0.82	0.85	0.83	0.83	0.85	0.86
SK	-0.81	-0.87	-0.94	-0.82	-0.96	-0.81	-0.90	-1.11	-1.07	-1.11	-0.91	-0.87	-0.86
KUR	0.44	0.61	0.41	0.82	0.34	0.88	0.58	1.12	0.83	1.06	0.24	0.05	-0.06
	Week												
AT_W	0	1	2	3	4	5	6	7	8	9	10	11	12
N	182	181	181	179	182	182	181	181	182	182	181	182	180
M	2.79	2.74	2.82	2.86	2.87	2.83	2.84	2.83	2.89	2.88	2.90	2.88	2.91
SD	0.56	0.62	0.63	0.64	0.68	0.66	0.62	0.70	0.66	0.65	0.64	0.64	0.70
SK	-0.13	-0.13	-0.25	-0.39	0.23	-0.37	-0.39	-0.42	0.66	-0.27	-0.29	-0.41	-0.18
KUR	-0.61	-0.53	-0.36	-0.38	1.24	-0.34	-0.02	-0.37	0.41	-0.27	-0.36	0.04	-0.49

Note. N = sample size; SD = Standard deviation; SK = Skewness; KUR = Kurtosis; *Comp* = written compositions per week; SE_W = Self-efficacy for writing per week; SRL_W = SRL in writing per week; AT_W = Attitude toward writing per week.

4.3.2 Multilevel analyses

Selecting the best model

To address our first goal (i.e. examine whether the outcomes in compositions of students who wrote week-journals differed from those of the students in the comparison group), we begun by selecting the best linear mixed model. Table 4.2 presents the results of fitting six growth curve models for two-level (level-1 occasions nested within level-2 students) and three-level (level-1 occasions nested within level-2 students nested within level-3 classes) compositions (*Comp*) data, using full ML in SAS PROC MIXED. The unconditional two-level growth model (A) examines the standard linear change, the unconditional two-level growth model (B) and three-level growth model (C) examines the quadratic change, the conditional three-level growth model (D) examines the effects of three varying-time predictors, the conditional three-level growth model (E) examines the effects of three independent-time predictors, and the conditional three-level growth model (F) examines the effects of program.

Table 4.2 *Comparison of fitting alternative growth curve models to the drafting learning data*

	Model A (two-level)		Model B (two-level)		Model C (three-level)		Model D (three-level)		Model E (three-level)		Model F (three-level)			
Fixed Effect	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	DF	*t*Value
Mean, $\hat{\gamma}_{000}$	51.981***	0.564	51.736***	0.681	51.934***	1.753	51.895***	1.742	45.286**	5.547	37.570**	2.659	8	35.92
Time, $\hat{\gamma}_{100}$	0.472***	0.041	0.473***	0.041	0.434**	0.118	0.425**	0.117	0.428**	0.117	-0.072	0.333	2344	-0.22
Time^2, $\hat{\gamma}_{200}$			0.018	0.012	0.016	0.029	0.018	0.029	0.018	0.029	0.222***	0.064	2344	3.47
Self-efficacy, $\hat{\gamma}_{300}$							-0.031	0.273	-0.035	0.267				
Self-regulation, $\hat{\gamma}_{400}$							0.505*	0.255	0.566*	0.236	0.591*	0.235	2344	2.51
Attitude, $\hat{\gamma}_{500}$							0.371	0.277	0.320	0.268				
Gender, $\hat{\gamma}_{010}$									0.554	0.589				
Age $\hat{\gamma}_{020}$									0.670	0.555				
Prior Achievement, $\hat{\gamma}_{030}$									4.602***	0.360	4.629***	0.349	2344	13.26
Treatment, $\hat{\gamma}_{001}$											9.557**	1.707	8	5.60
Treatment × Time, $\hat{\gamma}_{101}$											0.334	0.211	2344	1.58
Treatment × Time^2, $\hat{\gamma}_{201}$											-0.136***	0.041	2344	-3.35
Random Effect	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE		
Level-1 (within-subject variance)														
Random error, $\hat{\sigma}^2$	20.253***	0.641	16.993***	0.564	16.997***	0.564	16.966***	0.564	16.967***	0.563	16.985***	0.566		
Level-2 (between students within classes variances)														
6-week status, $\hat{\tau}_{00}$	56.309***	6.066	81.462***	8.852	52.216***	5.952	50.227***	5.800	27.247***	3.334	27.716***	3.589		
Linear rate, $\hat{\tau}_{\pi 11}$	0.188***	0.032	0.205***	0.032	0.071***	0.180	0.073***	0.018	0.073***	0.018	0.073***	0.018		
Quadratic rate, $\hat{\tau}_{\pi 22}$			0.018***	0.003	0.009***	0.002	0.009***	0.002	0.009***	0.002	0.009***	0.002		
Level-3 (between-classes variances)														
6-week status, $\hat{\tau}_{\beta 00}$					27.614*	13.652	27.338*	13.471	27.750*	3.329	5.574*	3.284		
Linear rate, $\hat{\tau}_{\beta 11}$					0.131*	0.063	0.127*	0.061	0.127*	0.061	0.102*	0.049		
Quadratic rate, $\hat{\tau}_{\beta 22}$					0.008*	0.004	0.008*	0.004	0.008*	0.004	0.003*	0.001		
Goodness-of-fit														
Deviance Statistic	14642.0		14402.3		14249.6		14224.8		14107.1		14089.4			
AIC	14654.2		14422.3		14281.6		14262.8		14147.1		14131.4			
BIC	14673.4		14454.4		14286.4		14268.5		14153.2		14137.8			

Note. *p < .05; **p < .01; ***p < .001

To select the best model, first we analyzed the results (not shown in the Table 4.2 due to space) corresponding to the unconditional means model (i.e., a no-change trajectory model). The estimated outcome grand mean across all occasions and students was 51.98 ($p < .001$), which suggests that between the first and the twelfth week, the average in the variable *Comp* (compositions) is non-zero. Examining the variance components, we found statistically significant variability both within-students (55.85, $p < .001$) and between-students (26.48, $p < .001$). Hence, we concluded that the compositions outcome (*Comp*) varies from week to week and also that students differ from each other.

To determine whether the unconditional mean model is preferable to Model A, we tested the compound null hypothesis on the differences between the models (i.e., rate of the response change throughout time, its associated variance components and covariance between slope and intercept) (this term is not shown in the Table 4.2 due to space). The difference in deviance statistics, (15057.2 - 14642.0) = 415.2, far exceeding 16.27, and the 0.001 critical value of a χ^2 distribution on 3 degrees freedom (*df*), allow us to reject the null hypothesis (H_0) stating that all three parameters are simultaneously 0. Hence, the unconditional two-level growth model (model A) provides a better fit than the unconditional means model. Should we go further on the analysis or choose the parsimonious Model A which have shown to somehow fit data? Comparison of Models B and A suggest the need to continue searching for a best fit model. Comparing deviance statistics for pair of nested models yields a difference of 239.7. As this exceeds the .001 critical value of a χ^2 distribution on 4 *df* (18.46), we reject the H_0, concluding that there is potentially predictable variation in acceleration rate across students. In Model B, although the variance for quadratic component of change (r_{2i}) is statistically significant ($p < .001$), its associated fixed effect (*TIME*^{2}) is not. The tests associated with the random acceleration parameter indicate that there is substantial variation in the quadratic rates across students. The test for the fixed effect inform that the average value of these rates is indistinguishable from 0.

Next we compared the unconditional quadratic three-level Model C to the unconditional quadratic two-level Model B. Because students are nested within classes and these can vary considerably among themselves, a three-level model of level-1 occasions nested within level-2 students nested within level-3 classes was also used to analyze this clustered longitudinal design. Since there are only 10 classes, *Comp* dataset is not ideal for fitting a three-level growth model, still may be useful for descriptive purposes. As indicated in Table 4.2, the deviance statistics and number of estimated parameters for the unconditional Model C were 14249.6 and 16, respectively. The likelihood ratio test comparing the Model C to Model B yields a deviance difference statistically significant at any alpha level

we might reasonably select (14642.0 - 14296.4 = 345.6, with 6 *df* and $p < .001$), indicating that more complex model provides the better fit. Each information criterion is consistent with is judgment.

Once we seek a level-1 individual growth model that describes the fundamental structure of data, we included not just the additional time-varying predictors (i.e., *SE_W*, *SRL_W* and *AT_W*) but also the required additional variance and covariance components (see Model D). Although not shown in the Table 4.2, the covariance components were not constrained to be 0. When comparing Model D with Model C, there is significant evidence that the model that incorporates time-dependent covariates fits better. The difference in deviances was statistically significant (24.8 (14249.6 - 14224.8); with $df = 3$ and $p < .001$).

Having identified an appropriate level-1 model, we included the additional effects of time-invariant predictors into level-2 model (i.e., *AGE*, *GEN* and *P_ACHIEV*). In the Model E (i.e., model that incorporates time-varying predictors and time-invariant predictors), the deviance statistic was 14107.1 with 22 *df*. In the Model D (i.e., model that only incorporates time-varying predictors), deviance statistic was 14224.8 with 19 *df*. As a result, the likelihood ratio test statistic was 117.1 with 3 *df* ($p < .001$), which provides strong evidence for Model E.

First hypothesis: There are differences in the quality of writing between students in classes doing week-journals and students in classes who did not do that extra writing activity.

Having explored a variety of predictors and models for our data, we explored whether students nested within classes doing week-journals for 12 weeks progressed over time differently (i.e., showing different average velocity and acceleration), than those who did not do week-journals. Model F of Table 4.2 presents the results of fitting this model to data. The final conditional model (Model F) included one class-level variable (here *TREAT*), one student-level variables (*P_ACHIEV*) and three within level-1 repeated observations (*TIME*, $TIME^2$, and *SRL_W*). The likelihood ratio test have been used so far for selecting the best model by comparing nested models. However, the simpler model, apparently the Model E, is not a particular case of the more complex final model (Model F). For purposes of comparing alternative models for data, information criteria such as AIC and BIC are a viable option in these cases (Vallejo et al., 2011; Vallejo et al., 2014). The AIC (BIC) weight of this model suggested that there is a

very high probability for Model F to be the best model among all of the models examined. We therefore adopted Model F as our "final model".

Firstly we considered the results for the fixed effects corresponding to Model F presented in Table 4.2. At the population level, no evidence was found of a statistically significant linear rate of change in the mean response of the control group students ($\hat{\gamma}_{100} = -0.072;\ p = 0.825$). The average rate of growth in the mean response for the experimental group was ($\hat{\gamma}_{100} + \hat{\gamma}_{101}) = 0.262$. Meaning that there is no evidence to support a trend across time essentially linear at the population level in the members of the experimental group. On the contrary, the results suggest that the quadratic rate of change is statistically significant at population level, both for members of the comparison group ($\hat{\gamma}_{200} = 0.222;\ p < 0.001$) and for members in the experimental group ($\hat{\gamma}_{201} = -0.136;\ p < 0.001$). However, it should be noted that the students of the comparison group have a rate of acceleration positive while the students of the experimental groups have a rate of acceleration negative. We have also found that the participants' mean response was positively affected by prior achievement ($\hat{\gamma}_{030} = 4.629;\ p < 0.001$) and SRL in writing ($\hat{\gamma}_{300} = 0.591;\ p = 0.012$). The relationship between the time-varying covariate SRL in writing and the outcome variable was constant across time.

At class level, a significant relationship between the type of treatment applied and the students' mean achievement was observed ($\hat{\gamma}_{001} = 9.557;\ p < 0.001$). The difference throughout the time of the *Comp* mean response for both groups (i.e., students in the experimental and comparison classes) is presented graphically in a time plot of means of model estimates for means of the dependent variable for each 12 consecutive weeks of investigation (see Figure 4.2). The significant main effect for students in classes doing week-journals reflects the fact that the time curve of means for the classes of the experimental condition was higher at all time points than the corresponding curve for the classes of the comparison condition. Note also that the level-3 predictor acts as a moderator variable and modify the relationship between the quadratic term of change and achievement growth over time ($\hat{\gamma}_{201} = -0.136;\ p < 0.001$). Despite the two groups did not show differences at the first measure, the significant interaction between the experimental condition and the quadratic trend is reflected on a fast upward curvature in the curve for the students in the experimental classes and a slight downward curvature in the curve for the students in the comparison classes. However, as the weeks went by, both curves increased gradually to horizontal. This indicates a faster rate of achievement in the first weeks for the students in experimental group

Analyzing the variances estimates, findings show that at student-level the estimate constant variance ($\hat{\tau}_{\pi 00}$) is much larger than the estimate linear trend component ($\hat{\tau}_{\pi 11}$), which is much larger than the estimated quadratic trend component ($\hat{\tau}_{\pi 22}$). In terms of relative percentages, these three represent 98.5, 1.4, and 0.1, respectively, of the sum of the estimated individual variance terms. A similar result is observed at the class level ($\hat{\tau}_{\beta 00}, \hat{\tau}_{\beta 11}$, and $\hat{\tau}_{\beta 22}$), although heterogeneity in trends across time becomes smaller as the order of trend terms increase. Note also that final estimation of level-1 and level-2 variance components has been affected very little by model respecification (Model F *vs*. Model E). However, final estimation of level-3 variance components have been substantially diminished when compared with the parameters estimates for Model E.

Second hypothesis: There are differences in the quality of writing in function of the quality of the week-journals.

Having found that the mean of the quality of the compositions (*Comp*) varies among the classes, and that the functional relationship between quality of the compositions (*Comp*) before and after the duration of the study varies across the different experimental group the second goal our study was to build and construct an explanatory model that accounts for this variability. That is, answer the following question: why does the writing quality of the compositions (*Comp*) vary between the classes in the experimental group? To address this question, we carried out a new analysis, incorporating the quality of the weekly journals as one explanatory variable at the student level. We believe that the quality of the week-journals may be an important explanatory variable in the present research.

Table 4.3 presents the results of fitting two different models to deal with the variation in the quality of the weekly journals (the LQ-WJ group is composed by all students showing a score below average in the quality of week-journals; the HQ-WJ group is composed by all subjects above the average in quality of week-journals).

Table 4.3 *Effects on the quality of weekly journals (WJ) on Compositions outcomes of students in the week journal classes*

Quadratic model (WJ is a time-independent variable)						Quadratic model (WJ is a time-dependent)				
Fixed effect	Estimate	SE	df	*t*Value	Pr>| *t*|	Estimate	SE	df	*t*Value	Pr >| *t*|
Mean, $\hat{\gamma}_{00}$	54.389	0.658	88	82.57	< .0001	57.554	0.610	89	94.26	< .0001
Time, $\hat{\gamma}_{10}$	0.477	0.046	988	10.28	<. 0001	0.523	0.052	961	9.98	< .0001
Time^2, $\hat{\gamma}_{20}$	-0.007	0.016	988	-0.43	.6691	-0.029	0.017	961	-1.74	.0832
QD_P/QD_W, $\hat{\gamma}_{30}$	4.598	0.728	88	6.31	< .0001	1.335	0.229	961	5.84	< .0001
Random effect	Estimate	SE		*z*Value	Pr>| *z*|	Estimate	SE		*z*Value	Pr >| *z*|
6-week status, $\hat{\tau}_{00}$	27.018	4.534		5.96	< .0001	23.761	4.405		5.39	< .0001
Linear rate, $\hat{\tau}_{11}$	0.086	0.029		2.96	.0020	0.097	0.032		2.96	.0002
Quadratic rate, $\hat{\tau}_{22}$	0.014	0.004		3.85	< .0001	0.011	0.003		3.21	< .0001
Level-1 error, $\hat{\sigma}^2$	13.815	0.686		20.21	< .0001	12.247	0.690		17.75	< .0001
Fit Statistics										
Deviance	6236.7					6113.6				
AIC	6258.7					6135.6				
BIC	6286.2					6163.1				

As table 4.3 shows, regardless of considering the quality of the weekly journals as a time-independent (left panel) or a time-dependent (right panel) predictor, a significant relationship between the variable quality of journals and the students' mean achievement was observed $(\hat{\gamma}_{30} = 4.598/1.335;\ p < 0.001)$. Comparing the regression coefficients, we see that only the intercept and linear time slope are significant. Turning, to the variances estimates, again we see that all of the improvement in model is through the inclusion of quadratic time slope as a random effect, and not as a fixed effect.

4.4 Discussion

In this study, using a longitudinal cluster-randomized controlled design, we examined the impact of writing a week-journal on the quality of writing compositions. To our knowledge this is the first study that examined the benefits of writing journals by conducting a longitudinal cluster-randomized controlled design using a multilevel modeling analysis. Based on literature (e.g., Hillocks, 1986), students' writing a journal throughout twelve weeks were expected to achieve higher in writing compositions than students who did not do it. Besides, with the purpose of understanding in depth this effect, students' week-journals were split into two groups (i.e., journals with high quality and journals with low quality). Furthermore, with the aim of providing a reliable assessment of the contribution of writing journals to the writing quality of compositions, we also investigated the impact of this writing

task on students' attitudes toward writing, their self-efficacy in writing, the use of SRL strategies while writing, prior achievement, gender and age. Hence, multilevel analyses were conducted and their impact estimated.

To further understand and contextualize our findings we conducted a qualitative analysis of the notes on the teachers' perspectives of the value of writing journals and their perceived impact on students' progress (see, McInerney, 2012; Rosário, Núñez, Vallejo, Cunha, Nunes, Mourão et al., 2015; Rosário, Núñez, Vallejo, Cunha, Nunes, Suárez et al., 2015). This information was shared on the post-intervention evaluation meeting. The discussion of these findings will be limited, still may help to interpret findings and open new avenues for research.

4.4.1 The impact of journal writing in enhancing writing quality

As expected, findings have shown that the quality of the students' compositions in the experimental group improved progressively over time, still students who wrote weekly journals showed a higher improvement on the quality of the compositions, than that achieved by students in the comparison group. These findings are consistent with the claims of Applebee (2000) and of Lo and Hyland (2007), who suggested that providing extra and more frequent writing tasks increase students engagement in writing and their writing quality. Still our data do not match those of previous studies (e.g., Arthur, 1981; Gomez, et al., 1996; Hillocks, 1986; Wienke, 1981) that found no statistical evidence for the effectiveness of free writing on students' writing quality. Gomez et al. (1996) for example, explained their findings stating that to improve the students' writing quality the intervention should have been extended more than six weeks.

Students' enthusiasm with writing week-journals may help to explain the initial slope of our findings, which is consistent with the knowledge that free writing without assessment proposes, foster students engagement in writing (Applebee, 2000; Boekaerts & Corno, 2005; Galbraith & Rijlaarsdam, 1999; Hillocks, 1986; Lo & Hyland, 2007; Tynjälä, 2001). A statement from one participating teacher may shed some light on results: *"As time went by, I noticed that students wanted to express their own ideas with more clarity in the journals. For example while writing they often looked in the dictionary for the 'right' words, and for the 'right' way to write them or to find synonyms. I was impressed how this [week-journals] worked, because in the past, when asked to write a composition, they [students] never did it in their own initiative"* (T7).

Still, the quality of students' compositions in the experimental group reached a plateau after the three initial weeks of the investigation. Findings suggest that despite of the important contribution of week-journals, writing freely without receiving feedback may not enough to sustain students' progress and master writing proficiency. To achieve higher levels of writing performance, students should receive feedback on their writing performance with clear guidelines to progress on writing (e.g., Brookhart, 2008; Shunk & Schwartz, 1993; Shute, 2008). Moreover, to improve their writing skills students should receive instruction on writing. For example, school administrators should consider organizing training for teachers addressing effective practices for implementing writing skills. For example the use the Self-Regulation Strategy Development (SRSD) model in class, one of the most successful and effective evidence-based methods for writing instruction (Graham & Perin, 2007; Graham, McKeown, Kiuhara, & Harris, 2012; Graham, Harris, & Santangelo, 2015).

4.4.2 SRL strategies to improve writing quality

The students who wrote week-journals, reported a higher use of SRL strategies in writing of compositions, what confirms the importance of having include this as covariate. This positive and significant impact indicated that the higher the SRL competencies, the better the achievement in writing compositions. This finding is consistent with that of previous studies, which have shown that students who receive training in SRL strategies are likely to engage more deeply in school tasks (Núñez et al., 2013; Rosário, González-Pienda et al., 2010), to be more motivated (Applebee, 2000; Braddock & Jones, 1969; Lo & Hyland, 2007), and to write narratives with high quality (Flower & Hayes, 1981; Bereiter & Scardemalia, 1987; Glaser & Brunstein, 2007). The cyclical SRL process (e.g., Rosário, Núñez, González-Pienda, Cerezo, & Valle, 2010; Rosário et al., in press; Zimmerman, 1998; 2000) was evident in teachers' discourses. *'*[Students] *were worried about the quality of their stories. They wanted to write a* good *beginning, main body and ending. Having only 45 minutes to write, this limitation pushed them to manage time efficiently and to be more focused"* (T6). This effort put on "doing well", may help to explain initial findings, still to master writing skills, students should be equipped with a set of SRL strategies helping them to manage their own learning, monitor actions and use feedback to modify or adjust behaviors and reach self-set goals (Fitzgerald, 2013; Harris & Graham, 2009; Graham et al., 2015; Rosário, Núñez et al., 2010; Zimmerman & Riesemberg, 1997).

4.4.3 Self-efficacy beliefs and Attitude towards writing

Contrary to expectations (see, Graham et al., 2007; Pajares & Valiente, 2006; Pajares et al., 2007), self-efficacy and attitude towards writing were not related with the quality of compositions. Besides, the increment in the quality of the compositions was not associated with self-efficacy and writing attitude towards writing. Despite their progress on quality, students' who wrote week-journals did not perceived themselves as more capable or prone to engage in writing activities. These findings do not match teachers' perceptions on their students' self-efficacy and attitude towards writing. All the teachers' enrolled in the experimental condition referred with enthusiasm the change in their students writing behaviors, as the following quotation exemplifies: *"as the weeks went by, I noticed that they [students] were, more engaged and more able writers"* (T2) *or "For the first time, I felt that my students got great pleasure from writing and this led me think that we* [teachers] *are so worried about assessment that we forget the importance of enjoying learning"* (T5). Other teachers exemplified students' enthusiasm using their own sentences "*I love writing on my journal*" (T10) or "*Ohhh, today is still not Friday, I really want to write about my week*" (T3).

This mismatch between teachers' perceptions and students' reports on self-efficacy beliefs and attitude towards writing may be due to the difficulty to capture subtle on going changes in students' behaviors using self-reports. Findings suggest the need to capture students' self-efficacy and attitude behaviors towards writing using on-task measures. That data may help to deep our understanding on the complex process of self-regulate writing. Hence, further research may consider using additional ways of collecting data other than questionnaires, for example using observational measures, or SOLO taxonomy (Biggs & Collis, 1982) to analyze the structural complexity of a writing task.

4.4.4 General conclusions and implications

In brief, the findings of this study, show that providing early extra writing opportunities, on the form of writing weekly journals, fostered the use of SRL strategies and significantly improved the quality of the compositions. When differentiating students who wrote weekly journals from those who did not (see Model F), three conclusions may be drawn:

First, the differences in the performance of the written compositions at the end of the 12th week were modulated by the use of SRL strategies over time, as well as by previous levels of competence in writing compositions (i.e., prior achievement). Second, when controlling these two variables, and

focusing on the last composition of students' at both groups (comparison and experimental) there is a significant statistical difference between them. Our data show that writing a weekly journal for three months increases students' abilities to write narratives. Third, the relationship between time (i.e., twelve weeks) and students' writing performance was found to be nonlinear. Data presented in Table 4.2 (Model F) indicates that this relationship is in fact quadratic. As it may be seen in Figure 4.2, the quality of the compositions increased more rapidly and intensively in the first three weeks, while the curve present a progressive but slight growth in the remaining weeks.

Moreover, in this study we also examined how the different writing quality of the week-journals was related with the progress in the writing quality of the compositions. Students' journals were assessed throughout twelve weeks and were divided in two groups to address this second goal: journals with a high quality and journals with a low quality. The results (see Table 4.3 and Figure 4.2) indicate that the higher the writing quality of the week-journals, the higher the writing quality of compositions.

These findings may be important especially for schools without the resources to organize school-based interventions to promote writing. In fact, writing a journal does not require unbearable costs and it can be used in class easily. Thus, writing journals may constitute a powerful tool that is accessible to all teachers and may be put into practice in classes worldwide. Also families may use week-journal to promote writing at home, still further research is needed to conclude on the efficacy of this tool at home.

This writing activity could be used as a preventive approach mitigating some of the problems related with poor writing. Still the efficacy of week-journals in promoting writing quality is likely to improve if students receive feedback focusing ways to improve their writing (e.g., Brookhart, 2008; Shute, 2008). Week-journals could also complement the activities of school-based programs targeting writing instruction such as the SRSD program (Graham & Perin, 2007; Graham et al., 2012, 2015), maximizing the writing development of children.

4.5 References

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5. THE IMPACT OF THREE TYPES OF WRITING INTERVENTION ON FOURTH-GRADE STUDENTS' WRITING QUALITY

Rosário, P., Högemann, J., Núñez, J. C., Vallejo, G., Cunha, J., & Fuentes, S. (submitted). The impact of three types of writing intervention on fourth-grade students' writing quality. *Contemporary Educational Psychology*.

5.1 Introduction

In the last decades, students' writing problems throughout schooling have been discussed as a topic of educational concern due to the importance of writing in school and life success (e.g., employment) (e.g., Graham, 2008; Graham, Harris, & Hebert, 2011). To mitigate students all over the world writing problems, curriculum reforms have been made in different educational systems and research have been investigating the efficacy of various school-based interventions in improving students' writing (e.g., free writing activities, strategy instruction as Self-Regulation Strategy Development, SRSD) (e.g., Glaser & Brunstein, 2007; Gomez, Parker, Lara-Alecio, & Gomez, 1996; Graham, McKeown, Kiuhara, & Harris, 2012; Harris, Graham, & Mason, 2006).

Still, there is a need to develop students writing skills (Gilbert & Graham, 2010) and to disclose evidence on the effectiveness of various types of writing interventions using a robust design methodology.

Hence, the current study followed a cluster-randomized controlled design along twelve weeks to analyze the effectiveness of three writing interventions (i.e., week-journals, SRSD, and SRSD plus a Self-Regulated Learning program using a story-tool) on fourth graders motivational variables and writing quality.

5.1.1 Promoting students' writing performance

Previous research have strengthened the idea that writing is one of the most powerful and fundamental tools, not only to learn, but also to communicate and share knowledge (Graham, 2006;

Prior, 2006). In fact, the ability to communicate and express one's thoughts and ideas through writing is truly essential for success at school and in further education (Hillocks, 2006).

Acknowledging the need to improve students' writing performance, researchers have been developing and examining the efficacy of various types of writing interventions to enhance students' writing (e.g., Glaser & Brunstein, 2007; Graham, Harris & Mason, 2005; Harris, Graham, & Adkins, 2015; Rosário et al., submitted). This section provides an overview of three types of interventions that are examined in the current study.

5.1.2 Week-journals

Students' motivation and engagement in writing are likely to grow in learning environments providing various opportunities and encouragements for students to express themselves through writing (Applebee, 2000; Braddock & Jones, 1969; Lo & Hyland, 2007; Perry & VandeKamp, 2000). Writing week-journals is among the practices that can be easily implemented in classrooms without much effort, time, and resources (e.g., Graham, McKeown et al., 2012; Rosário et al., submitted).

Writing journals is a type of free writing that is informal and personal (Hillocks, 1986; Tynjälä, 2001). The nature of this educational tool allow students to write freely without strict directions, restrictions or assessment purposes (Hillocks, 1986). While writing journal, students write at their own pace, apply their own writing style and foster their sense of authorship (Raphael, Englert, & Kirschner, 1986).

A previous research by Jones and East (2010) with elementary school students concluded that writing a daily-journal increased students' writing confidence and control over their writing. Notwithstanding the potential positive influence of writing journals on students' motivation and writing performance (e.g., Hillocks, 1986; Jones & East, 2010), the extant research is not consistent. Prior research (e.g., Arthur, 1981; Gomez et al., 1996; Hillocks, 1986; Wienke, 1981) found no statistical evidence for the effectiveness of free writing on students' writing quality. Still, a recent study with fourth graders concluded that students who wrote weekly journals for twelve weeks showed a higher improvement on the quality of their compositions, than that achieved by students in the comparison group (Rosário et al., submitted). Despite of these encouraging findings, students in the experimental group reached a plateau after the first weeks of writing journals, which might indicate that this type of intervention may not be sufficient to foster continuous progress on writing quality (Rosário et al., submitted).

5.1.3 Writing and self-regulation

Considerable progresses have been made in the last thirty-five years to understand the role of self-regulation in writing. Not surprisingly, research found that skilled writer's master self-regulated learning competencies, for example, self-set goals and sustain writing behaviors while writing (Zimmerman & Riesemberg, 1997). Moreover, researchers and educators all over the world report that many students struggle with writing (Graham, Harris, & Santangelo, 2015), what may be due to the fact that effective writing requires: (i) high levels of self-regulation and attentional control to manage the writing environment; (ii) knowledge of the writing topic, genre, processes and skills involved in writing (Zimmerman & Riesemberg, 1997); (iii) strategies for planning, text production (Fitzgerald, 2013; Harris & Graham, 2009) and to monitor the writing activity (Scardamalia & Bereiter, 1986) to meet specific self-set goals (Alexander, Graham, & Harris, 1998).

Three decades ago, Karen Harris and Steve Graham built the Self-Regulation Strategy Development model (Harris & Graham, 1996), an instructional program to develop writing and self-regulation strategies with struggling writers that has been extensively examined (Graham & Harris, 2000; Graham, Harris, & Troia, 1998; Harris, 1982; Harris & Graham, 1992, 1996, 1999; Harris, Graham, Mason, & Friedlander, 2008).

Self-Regulation Strategy Development (SRSD) model

The SRSD model is one of the most successful and effective evidence-based tools for writing instruction (Glaser & Brunstein, 2007; Graham & Perin, 2007; Fidalgo, Torrance, & Robledo, 2011; Limpo & Alves, 2013). SRSD was designed with the aim of attaining three major goals, namely (Harris, Schmidt, & Graham, 1998): (i) to help students develop the knowledge and skills needed to manage the writing strategies involved in the writing processes (i.e., planning, writing, revising and editing); (ii) to support students while using the strategies and self-regulatory skills (e.g., goal-setting, self-instruction, self-assessment, self-reinforcement) while monitoring and managing their own writing (e.g., Graham & Perin, 2007; Harris et al., 2008; Harris, Graham, Brindle, & Sandmel, 2009); and finally (iii) to develop positive attitudes and beliefs about themselves as writers (Harris et al., 2008; Graham, Berninger, & Abbott, 2012; Graham, Berninger, & Fan, 2007). In fact, when students perceive themselves more self-efficacious in writing, they are more likely to show evidence of good writing quality and invest more effort while carrying out a writing task (Graham et al., 2007; Pajares & Valiente, 2006; Pajares, Valiante, & Cheong, 2007).

The writing instruction process closely linked to students' progress, takes place across six recursive, interactive and individualized instructional stages, as follows: (i) development of background knowledge; (ii) discussion and description of the strategies to be learned; (iii) modeling the use of those strategies; (iv) memorization of those strategies; (v) supporting of the strategies; (vi) and, finally, independent performance (Harris et al., 2008).

More recently, three meta-analysis have been conducted with the aim of testing the impact of the SRSD model on students' writing (Graham, McKeown et al., 2012; Graham & Perin, 2007; Rogers & Graham, 2008). Graham, McKeown et al. (2012) have found that adding self-regulation instruction (e.g., goal setting and self-assessment) to strategy instruction is likely to improve the overall writing quality of typical developing writers and, in most cases, of struggling writers.

The benefits of participating in SRSD programs are well established in literature (e.g., Graham et al., 2015), still further research is needed to explore complementary forms infused in regular curriculum that may boost the teaching of writing strategies (Glaser & Brunstein, 2007; Graham, McKeown et al., 2012; Rosário et al., submitted). For example, using story-tools in class (Rosário et al., in press). According to literature, the use of story-tools to promote SRL foster students motivation, encouraging them to take control of their learning, namely that in writing of compositions (Núñez et al., 2011; Núñez, Rosário, Vallejo, & González-Pienda, 2013; Rosário, Núñez, Azevedo et al., 2014; Rosário et al., in press; Rosário, Núñez, Trigo et al., 2015). Hence, infusing story-tools in the regular curriculum combined with writing instruction (i.e., SRSD) may be beneficial for increasing the levels of writing quality.

5.1.4 Story-tools to promote SRL

Stories, traditional tales and fables are well-known ways of delivering knowledge (Rosário et al., in press) to promote children's development (Ellis, 1997; Erickson, 1995; Meyer, 1995; Rosário, Núñez, & González-Pienda, 2007), imagination (Alna, 1999), and self-reflection about their own behaviors (Rosário et al., in press).

The *Yellow Trials and Tribulations* (Rosário et al., 2007) is a story-tool designed to develop student's SRL strategies (e.g., goal-setting, self-reflection, strategic planning, and organizational strategies), and increase motivation to do school tasks and academic achievement (Rosário, Núñez, González-Pienda, Cerezo, & Valle, 2010). This program is rotted on the social cognitive framework that assumes that contextual variables and learning settings play important roles in student's motivation and

self-regulation (Rosário, Núñez, Rodríguez et al., in press). Each book chapter of the *Yellow Trials and Tribulations* is based on the SRL model by Zimmerman (1998, 2000). According to this author (Zimmerman, 1998, 2000), SRL involves three independent phases (i.e., forethought, performance and self-reflection phases), which are the basis of the PLEE cyclical model: Planning, Execution and Evaluation (see Rosário, Núñez et al., 2010 and Rosário et al., in press for a more detailed explanation). The latter presents a recursive structure, through two paths of logic. The process not only proceeds from Planning through Execution to Evaluation, but the same cyclical nature is also reset in each phase, thus reinforcing the self-regulation logic of the process. The two structuring loops of this model reinforce the SRL synergy, allowing the SRL process to be experienced as a whole (Núñez et al., 2013; Rosário, González-Pienda et al. 2010; Rosário et al., in press).

Modeling and teaching all the learning strategies referred in the story-tool underlies on three types of knowledge (Núñez et al., 2013): (i) the declarative knowledge, requiring students to know a set of different learning strategies (e.g. know what taking notes is); (ii) the procedural knowledge is related to learn how to implement these learning strategies (e.g., know how to take notes in class); and, finally, (iii) the conditional knowledge demanding from students to know when it is more appropriate to use a specific learning strategy in a particular learning context (e.g., when it is more useful to take notes) (Alexander, 2006). For example, in chapter 6 of the story-tool (Rosário et al., 2007), the Ant General, one of the characters, explained the planning phase to his *troops* (i.e., declarative knowledge): "in order to plan, we have to decide what we need to know and what we need to do for everything to run smoothly. Afterwards, to avoid any problems, we allocate time for each task" (p. 27).

Therefore, training this type of knowledge will help students to manage their own learning and situational resources across a variety of contexts, monitor their actions, and use feedback to adjust behaviors to meet self-set goals (Muis, 2007; Rosário et al., 2010; Rosário et al., in press).

The various chapters of the narrative, as the example previously provided, gives students the opportunity to acquire, practice and reflect on the use of the SRL strategies embedded in each phase of the PLEE model. This tool allows the analysis of the characters' behavior which are similar to those of children in real life situations (e.g., *the Bird-Teacher told the little birds a story about a lazy deer who did not listened to the teacher advice's friends and hurt himself while competing with a grasshopper*), hence leading students to reflect on what they may learn with the help of the characters' behaviors. This experiential closeness fosters children's engagement in learning, and the development of a positive attitude toward the strategic contents introduced by the narrative (Rosário et al., in press). For example,

it is expected from students to transfer the content learned throughout the story to the process of writing compositions.

5.1.5 Present study

Driven by the worldwide need of promoting students' writing quality and of examining the impact of various types of writing interventions tailored to students' needs and school resources, the current study aims to examine the impact of three types of writing interventions (i.e., week-journals, SRSD, and SRSD plus a SRL program using a story-tool) on students' writing quality. Moreover, it is also examined the impact of several potentially covariates, such as self-regulation in writing, self-efficacy beliefs, attitude towards writing, prior achievement in writing, gender, age and interactions between these variables and time. Based of extant literature (e.g., Graham & Perin, 2007; Rosário, Núñez, Azevedo et al., 2014; Rosário et al., submitted) we hypothesize that: (i) students' writing quality of the three intervention groups will be higher when compared to students in the comparison group; (ii) students' writing quality will be increased from the week journal condition to the SRSD plus the SRL story-tool condition; (iii) all covariates will be significantly related with students' writing quality.

5.2 Method

5.2.1 Design and participants

Design

The present study was conducted with fourth-grade students, the last grade level of the elementary school in the Portuguese educational system. Fourth-grade students have to complete at the end of the school year a national standardized exam in Portuguese language. In this exam students have to write a compositions in 45 minutes, which counts 30 out of 100 points.

The study followed a longitudinal cluster-randomized controlled design along twelve weeks, in 17 public schools in the north of Portugal. The participating teachers (N = 20) and their fourth-grade students (classes) were randomly assigned to the four conditions, with five classes participating in each condition (i.e., Groups A, B, C and D; see Figure 5.1). Group A followed the Portuguese curriculum for writing, being designated as comparison group. In group B, beyond following the regular curriculum, students wrote a weekly journal for 12 weeks. Students in group C and D received writing and SRL

instruction following the SRSD model. In general, SRL instruction in group C was similar to group D, still the story-tool "*Yellow Trials and Tribulations*" (Rosário et al., 2007) was also added to the treatment received by the group D.

Participating students and teachers

The participants were 370 (183 girls and 187 boys) fourth graders from 20 classes from 17 public elementary schools in the north of Portugal. The average age of the sample was 9.45 (*SD*=.51). In this sample, Portuguese was the primary language of the students. All students' families were lower-middle class families, as noted by the high percentage of students (40%) receiving free or reduced-price lunches. These demographic data were collected from the offices of the schools enrolled in the present study. The fourth-grade classes were randomly assigned to four groups: (i) to group A, comparison group (*N*= 92; (ii) to group B, week-journals (*N*=90); (iii) to group C, with SRSD instruction only (*N=98*); and (iv) to group D with SRSD instruction plus the story-tool of *Yellow trials and tribulations* (*N=90*). Students with special education needs (1 girl and 2 boys) were excluded from the data analyses. No statistically significant differences were found between the four groups.

The twenty teachers from the 17 public elementary schools enrolled in this study were asked to fill in a questionnaire to obtain information about their characteristics, including gender, age, preparation and teaching experience. From the 20 teachers, 17 were female and 3 male, aged between 34-56 years. All had an undergraduate degree obtained in a Portuguese university and an experience in teaching ranging between 12 and 34 years (*M*= 21.5; *SD*=6.16). Class sizes ranged between 10 and 23 (*M*=20.38; *DP*=4.75). None of the teachers enrolled in the study reported to have received proper writing instruction in their professional development. All teachers agreed to follow the Portuguese curriculum for fourth grade, and accordingly taught a variety of text genres, grammar and punctuation.

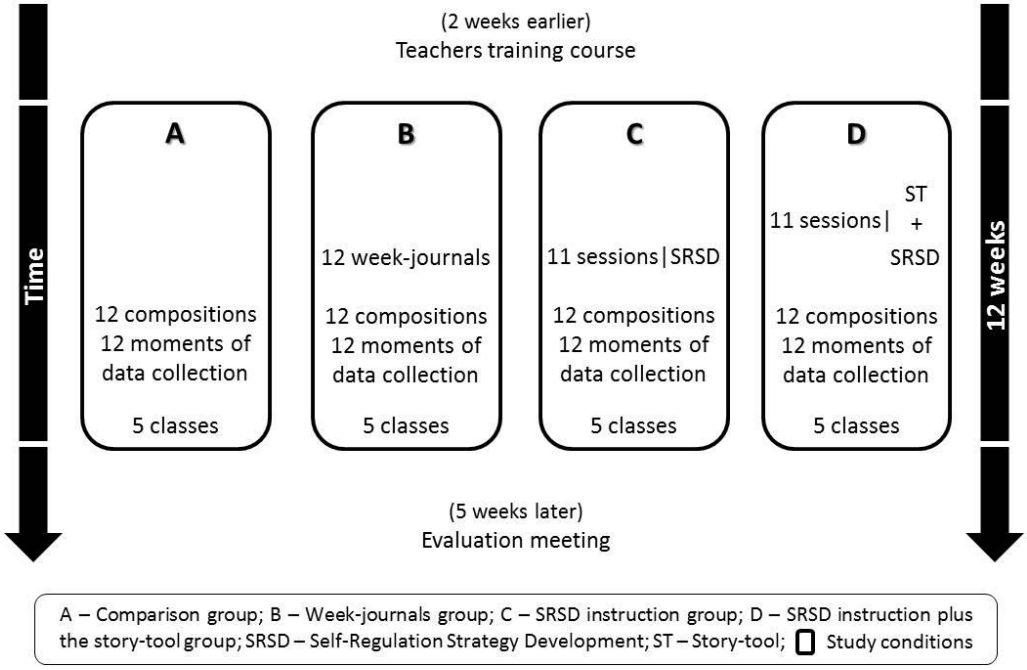

Figure 5.1. Schematic of each treatment condition and procedure.

5.2.2 Procedure

After receiving the consent from the Portuguese Ministry of Education, and email explaining the overall study objectives was sent to 26 public schools located in northern part of Portugal. Seventeen schools (a response rate of 65.4%) and their 20 teachers agreed to participate in our research.

Parents of the students enrolled in the participating classes were informed about the study aims and procedures through a letter and were asked for permission for their child's participation. All students returned the signed parental consent forms. Students' participation was voluntary, and confidentiality and anonymity were assured (e.g., eliminating the names and researchers' personal notes that could link the participants to their teachers or schools).

Teachers training course

Two weeks prior to the beginning of the study, teachers at all treatment conditions participated on a training course with two modules (see Figure 5.1). The first module comprised 9 hours and was spread over 3 days (with 3 hours session). These training sessions, run by the research team, included the presentation and discussion of the general framework (e.g., genre of the compositions, protocol to administrate the questionnaires) and measures (e.g., rating scale to assess the quality of the

compositions). In the second module with 8 hours (with 2 hours session) spread over 4-days, teachers worked collaboratively with researchers and assistant researchers (i.e., 20 pre-service teachers) on the assessment of the overall quality of the children compositions. To train on how to use the rating scale (see measures), teachers were asked to select a set of compositions made by their students on the third grade, and to switch those compositions with their colleagues and assistant researchers on a random basis. Each composition was assessed by a dyad (teacher and a research assistant), who worked independently to assess the overall quality of the composition using the rating scale. After scoring independently each composition, teachers and research assistants discussed scores to reach a consensus. To ensure a good reliability of the assessment process of the quality of the compositions, teachers assessed 8 compositions over the four days, each time with a different research assistant. Kappa value was calculated using the Coder Comparison Queries in the Navigation View of the NVivo software. In the end of the fourth day the Kappa value of the 20 dyads ranged between .80 and .86 (M=.82; SD=.017) which can be labeled as "almost perfect" according to Landis and Koch (1977, p. 165). In the final training session, a timetable with the dyads (i.e., teacher and a randomly assigned research assistant) scoring the compositions was presented and delivered. The compositions were done in class each Monday, and a copy of the compositions was delivered to research assistants, on the same day. Every Thursday after school, along 12 weeks, the dyads met to find consensus on the scores given. Finally, the graded compositions were delivered to students each Friday.

Five weeks post-intervention, the teachers participated in a three-hour evaluation meeting to analyze their experiences during the intervention (e.g., comments and suggestions that could help in future research), and to discuss preliminary data (see, Rosário, Núñez, Vallejo, Cunha, Nunes, Mourão et al., 2015; Rosário, Núñez, Vallejo, Cunha, Nunes, Suárez et al., 2015). In this meeting, teachers were also asked about the writing instruction followed during the intervention period. All teachers reported to have followed the national writing curriculum, spending more time teaching grammar, punctuation and the other types of genres to meet fourth grade level expectations.

Teachers who fully participated in the research were offered a 27-hour (1 ECTS) training course about learning and instruction processes conducted at the University (Universidade do Minho).

Specific intervention procedures

On a weekly basis, for twelve weeks, and every Monday morning during regular Portuguese language class, all students' from the four conditions wrote a composition (a narrative) in 45-minutes.

The composition topic was sent by email to all teachers each Sunday evening. Additionally, each Friday afternoon (i.e., for twelve weeks) students were asked to fill in the questionnaires to assess their SRL strategies in writing, attitude towards writing and self-efficacy, that lasted approximately 25 minutes. All instruments were administrated in class by the research assistants.

5.2.3 Comparison group (group A)

As previously referred, teachers enrolling in this comparison group followed the regular writing curriculum to meet fourth grade level expectations.

5.2.4 Week-journals (intervention condition – group B)

In this group, every Friday morning, students wrote a week-journal in 25 minutes, during the 12 weeks of the study. Each student received a notebook "journal" to write their weekly entries (i.e., approximately ten lines) about their week experiences at school (e.g., in the playground) or at home (e.g., cooking dinner with their parents). Journals were kept in the classroom in a closed box under the responsibility of a research assistant. Prior to the beginning of the study, participants' confidentiality were assured, by telling them that the week-journals would be only used for research purposes and their teachers would not read them.

5.2.5 General instructional procedures (intervention conditions C and D)

SRSD writing instruction was delivered along eleven sessions on a weekly basis, by one author of this paper. Sessions for students in group *C* were delivered in regular Portuguese language lessons in 45 minutes. For students in group *D*, the program SRSD + story-tool was delivered in 90 minutes. This instructional program worked on the same writing tasks of the SRSD instruction as group *C*, but the writing instruction was delivered using the story-tool to help students contextualizing the concepts and strategies. Both intervention conditions are briefly described in Appendix. An extended description of the lessons and materials suggested for instruction is provided elsewhere (Högemann, Rosário, Núñez, Rodríguez, & Valle, in press).

5.2.6 SRSD instruction (intervention condition – group C)

Six recursive stages of strategy instruction integrate the SRSD model to develop general writing and self-regulation strategies to apply in genre specific writing tasks (Harris & Graham, 1996, 2009), namely, (i) develop background knowledge; (ii) discuss it; (iii) model it; (iv) memorize it; (v) support it; and, at last, (vi) independent performance. In the present study, instruction started at the first stage and continued into the following stages (see appendix). Despite acknowledging the sequence of the content, we followed Harris and Graham (1996) and asked students to memorize the mnemonics taught (strategy from stage four), since session 1. Thus, this *stage* was recalled at the beginning of every session to analyze if students had memorized the mnemonics (Graham et al., 2005). A number of self-regulation procedures were also taught to students, including self-monitoring while planning their stories, self-reinforcement and self-assessment (Graham et al., 2005). The materials for teaching writing narratives using the SRSD model, were translated to Portuguese and used by fourth graders and their teachers.

Writing strategies

In the first sessions, students learned a general strategy to apply while writing their compositions. This strategy included three steps, represented by the mnemonic POW: *Pick my ideas (i.e., decide what to write about), Organize my notes (i.e., organize writing ideas into a writing plan), Write and say more (i.e., continue to modify, upgrading the plan while writing).* This specific mnemonic was translated to the Portuguese acronym POE that means: Pensa (Think), Organiza (Organize), and Escreve (Write). To help students carrying out the second step of POW (i.e., *organize my notes)* students were taught that good stories have at least three paragraphs, and learned a genre-specific strategy for writing notes for each part of the story: the mnemonic S-A-C [principal steps of a story: Setting (*S*), action (*A*) and conclusion (*C*)] (see Högemann et al., in press). To help students become familiar with the S-A-C mnemonic, students were taught to ask themselves the following six questions, aligned with the three S-A-C steps: *Where does the story take place? When does the story take place? Who are the main characters (describe them)? What do the main characters do or want to do (sort them in the right way)? How does the story end? How do the main characters and the others feel? (add a moral, if possible).* For writing notes, students were presented with a graphic organizer (see Högemann et al., in press).

Strategy instruction

The strategy instruction followed the SRSD model (Harris & Graham, 1996), however the time spent on each stage was adjusted to the design of the current study. As shown in Appendix, *lesson one and two* aimed to develop student's prior knowledge on composition and to discuss and explore the characteristics of a good story. General writing strategies (i.e., POW) were presented and discussed with students. Students' negative beliefs about writing performance were also discussed, and students were encouraged to change their negative thoughts into positive beliefs *(e.g., "I can do it, if I use the right strategy").* In *lesson three and four*, students revisit the general writing strategies (i.e., POW) and discussed the SRL strategies (i.e., self-instructions, goal setting, self-assessment and self-reinforcement) to be used before, during and after writing a story. In *lesson five, six and seven* the planning, writing and assessing of compositions using a set of general (i.e., POW) and SRL strategies (i.e., self-instructions, goal setting, self-assessment and self-reinforcement) taught were modeled collaboratively in class. Modeling the use of strategies helped students to learn how to apply these strategies and to develop competencies, attitudes and beliefs, while writing independently. *Lesson eight, nine* and *ten* were focused on strengthening students' abilities for independent planning, writing and assessing of stories by using general (i.e., POW) and SRL strategies (i.e., self-instructions, goal setting, self-assessment and self-reinforcement). The challenge of these lessons was to weaning the students off the graphic organizer (Graham et al., 2005). Finally, in *lesson eleven* students wrote, without support, a composition, using the writing and the SRL strategies learned. Still, as suggested by Harris et al. (2015), if any story elements were not included, the previous stages were recalled.

5.2.7 SRSD instruction plus the story-tool (intervention condition – group D)

Brief description of the story-tool

The *Yellow Trials and Tribulations* story-tool, written for elementary grade students, tells the story of the disappearance of the color Yellow from the Rainbow and describes the numerous adventures experienced by Yellows' friends, the other colors of the rainbow, whilst searching for Yellow. Along this quest in search for Yellow, who should have not been left alone, the other colors of the rainbow meet new friends and come across with various useful SRL strategies, which will enable them to overcome the difficulties and challenges faced along the way. The fact that the characters are colors and not children, albeit the characters' behaviors are based on children's real life situations, allows students to distance themselves from the moment and analyze the situation (Rosário et al., in press).

SRL instruction

In the current study, the *Yellow Trials and Tribulations* story-tool (Rosário et al., 2007) was used to help students learn a set of learning strategies and apply them into the story-tool learning context while reflecting upon their own writing activities (i.e., on how and when to implement the general and SRL strategies).

Sessions for the group D had two major parts. In the first part, at the beginning of each lesson, one or two chapters of the book were read out loud in class. Along the reading, small breaks were made and students were invited to discuss and analyze what was happening in the story plot, and to transfer these learning strategies into the writing of compositions (see Högemann et al., in press; Rosário et al., in press). Then, based on the chapters read, practical tasks were done in class. In the second part of the session students did writing tasks. This tasks were the same as that done by students in group C. The Appendix aligns the stages from SRSD (i.e., group C) with the chapters of the story-tool.

5.2.8 Instruments and measures

Students' notebooks

Individual notebooks were delivered for each participating student for research purposes. The notebooks had twelve parts (i.e., twelve independent writing moments) and each part had three parts: (i) firstly, a lined page was made available for the writing of the composition; (ii) secondly, a rating scale was provided for students to review and self-assess the quality of their compositions; and finally, (iii) a checklist for individual feedback given by the teacher.

Compositions

In order to assess the writing quality of students' compositions, a holistic rating scale was used based on the criteria defined in the Educational Progress Test (i.e., a standardized exam) in Portuguese language for fourth graders (Ministry of Education and Science, 2013). The rating scale assesses topics such as (i) title; (ii) organization (introduction, main body paragraph, ending), (iii) grammatical correctness of sentences (e.g., active verbs, use of direct speech, descriptive adjectives, punctuation, morphology) (iv) coherence; (v) originality; (vi) sentence structure, (vii) word choice; (viii) spelling errors. Teachers were asked to read first the paper to obtain a general impression of overall writing quality. Prior scoring, all narratives were typed into a Word document and the number of words were counted.

Students' personal information was removed and punctuation, spelling and capitalization were corrected to minimize bias that might influence the scoring process as suggested by the literature (e.g., Graham et al., 2007). Compositions were then scored on fourteen 5-point *Likert* scales (1 = low quality; 5 = highly quality), ranging from 0 to 65 points. All compositions from the same class were scored independently by a dyad (teacher-research assistant) using the mentioned rating scale. Each dyad met every week to find a consensus about the grades for each composition as previously stated (see procedures subsection). Moreover, before writing the next composition, students received their compositions rated for each topic assessed and a final score.

Journals

In the end of the study four new research assistants, unfamiliar with the design of the study, assessed all journals quality using the same grading scale. Each journal was assessed by two research assistants independently, by following the same procedures presented above (i.e., all journals were typed into a Word document; students' personal information was removed; punctuation, spelling and capitalization were corrected; each journal was scored using the rating scale, each dyad met to find consensus on the grade). Feedback on the week-journals was not provided.

Prior achievement

Prior achievement in Portuguese language was obtained from students' final grades in the third grade collected in the schools' secretariat. In Portuguese compulsory education, grades are 1 and 2 (negative), 3 (passing), 4 (good), and 5 (excellent).

Self-regulated learning strategies inventory

The original students' SRL Strategies Inventory developed by Núñez et al. (2013) assesses nine self-regulated learning strategies concerning the three phases of the SRL process (i.e., planning, execution and evaluation). In the preset study, this scale was adapted with the aim of assessing the SRL strategies used while writing: *Planning* (i.e., ''I make a plan before I begin writing. I think about what I want to say and how I need to write it''), *Execution* (i.e., While I write my composition I follow my plan", and *Evaluation* (i.e., ''I compare the grades I received with the goals I set for that subject.''). The 9-items were scored on a 5-point *Likert* scale, ranging from 1 (never) to 5 (always). Cronbach's alpha in this study was .80.

Attitude towards writing

Each of the 9 items from the writing attitude survey (Graham et al., 2007) asked students to indicate how they felt when they engaged in writing activities at school or at home (e.g., *How do you feel when you think you have to write instead of being able to play?)*. Students were asked to mark one of the four images of Garfield the Cat on a 4-point *Likert* scale (1 = very unhappy; 4 = very happy). This scale was, in the present study, translated and adapted to the Portuguese population. Cronbach's alpha in this study was .86.

Self-efficacy beliefs

To assess students' self-efficacy for planning and writing a story, we followed the five-items used by Graham, Harris and Mason (2005). An example of an item was *"When writing a paper, I have trouble finding the right words for what I want to say".* The five-items were scored on a 4-point *Likert* scale (1 = strongly disagree; 4 =strongly agree). This scale was translated and adapted to the Portuguese population. Cronbach's alpha in this study was .71.

Data analyses

Considering the hierarchical nature of our data a three-level hierarchical model was conducted. To avoid the enumeration of all the possible models, a data-driven strategy for selecting the best model by computing information criteria was used.

We begin the analysis with formulating a model. Figure 5.2 presents the so-called "spaghetti plot" of the CS scores by time. This plot suggests that individuals who received some form of treatment have an increase in the CS scores, though clearly there is considerable individual heterogeneity. It can be seen that some participants have accelerating positive trends, while others have decelerating negative trends. Some participants even have significant swings upward or downward, indicating improving or worsening across time of their CS response. In contrast, the trend lines appear to be approximately linear for others many participants. With regard to the population level, Figure 5.1 also shows interesting differences for the four groups across time. The non-regulated group (i.e., Week-journal) began with a moderate upturn in CS followed by a very slow increase, whereas the regulated groups (i.e., SRSD and SRSD+SRL) showed a moderate but steady and gradually accelerating upward trend up to the end of the study. The participants of control group did not show an upward trend.

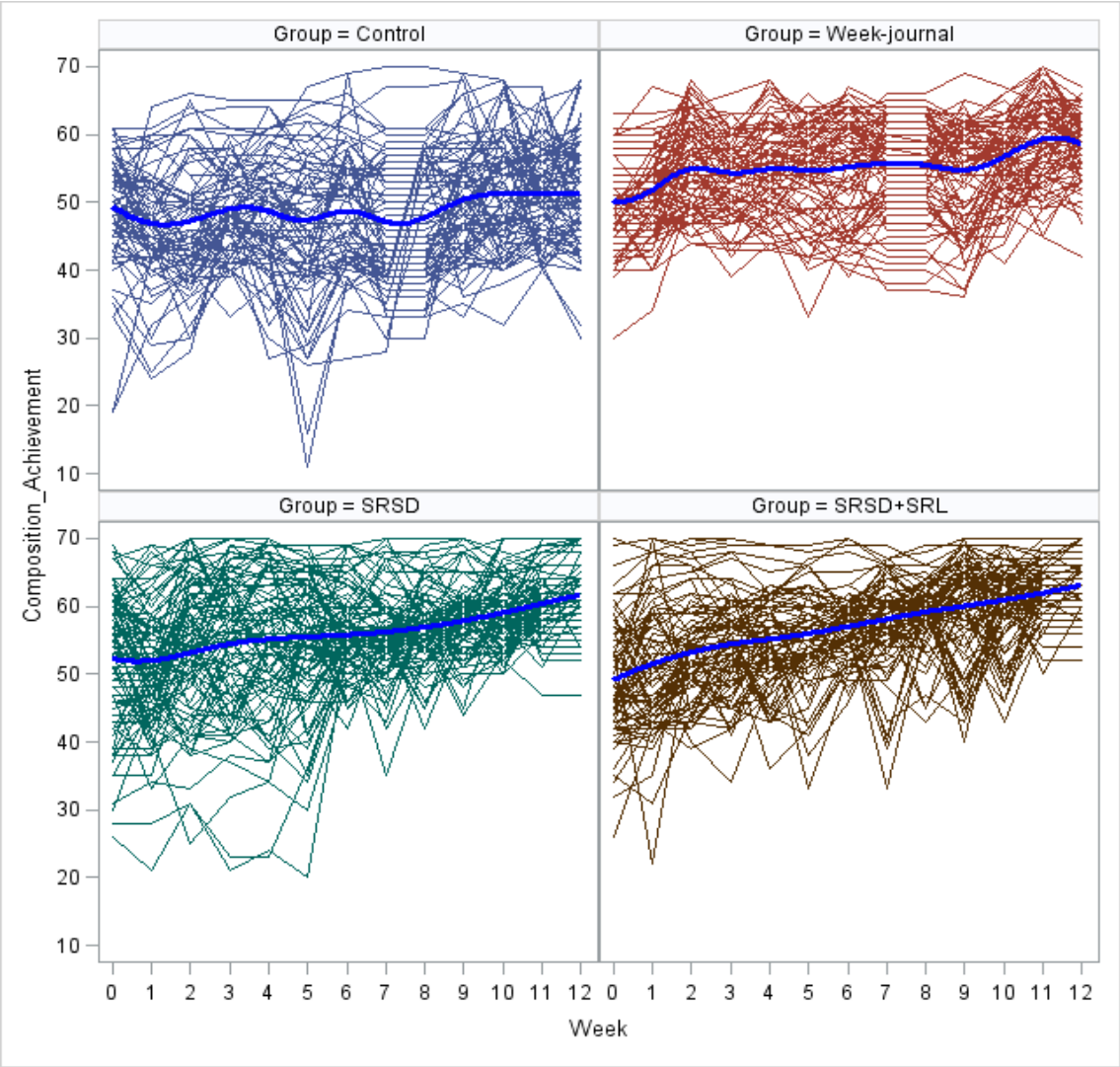

Figure 5.2. Spaghetti plot of observed data for each participant during the period under study, and means (solid line) of the different treatment groups.

Visual examination suggests that the relationship displayed in Figure 5.2 may be nonlinear at the individual level, hence it is assumed, subject to verification, a quadratic model to describe individual change across time. To begin, the *CS* outcome at time *t* for student *i* in class *j* is modeled at level 1 by

$$CS_{tij} = \pi_{0ij} + \pi_{1ij}(TIME_{tij} - L) + \pi_{2ij}(TIME_{tij} - L)^2 + \pi_{3ij}\, SE\_W_{tij} + \pi_{4ij}\, SR\_W_{tij} + \pi_{5ij}\, AT\_W_{tij} + \pi_{6ij}\, SR\_W_{tij} \times (TIME_{tij} - L) + \pi_{7ij}\, SE\_W_{tij} \times (TIME_{tij} - L) + \pi_{8ij}\, AT\_W_{tij} \times (TIME_{tij} - L) + e_{tij},$$

where π_{0ij} is the expected outcome for student *ij* at time *L* (here the centering parameter, *L*, was a priori set at 6 weeks to avoid potential collinearity problems in the quadratic trend model), π_{1ij}, the parameter associated with *TIME*, represents the rate of change in the *CS* for student *ij* at time *L* (in

our study the instantaneous rate of change when $TIME_{tij}$ = 0), π_{2ij}, the parameter associated with $TIME^2$, describes the quadratic change in the *CS* for student *ij* (i.e., captures the curvature or acceleration regardless of the choice of location for level-1 predictors), π_{3ij} is the student's change in *CS* due to self-efficacy for writing (*SE_W*), π_{4ij} is change in *CS* due to self-regulation in writing (*SR_W*), π_{5ij} is change in *CS* due to attitude toward writing (*AT_W*), π_{6ij} is change in *CS* due to cross-product between *SR_W* and *TIME*, π_{7ij} is change in *CS* due to cross-product between *SE_W* and *TIME*, π_{8ij} is change in *CS* due to cross-product between *AT_W* and *TIME*, and e_{tij} represents a residual.

Given the relatively modest sample of classes of the present study, we had the temptation to ignore the clustering of students within classes. However, as we will show later, the results of a preliminary analysis suggested considerable random variation and intercept and slope at both levels 2 and 3. The results also suggested the need to retain the main effects of time-varying predictors (i.e., *SE_W*, *SR_W* and *AT_W*) and the interaction between *SR_W* and linear *TIME* in the level-1 model but treat them as fixed instead of allowing them to change randomly across level-2 and at level-3 units. To correctly interpret the model parameters it is important to note that all time-varying predictors were entered into the model centred at its mean.

At level-2, individual differences in the random coefficients from level 1 (i.e., π_{0ij}, π_{1ij}, π_{2ij}) were modeled as a function of student's gender (girl = 1, boy = 0; *GEN*), prior achievement (ranging from 1 = not very well to 5 = very well; *P_ACHIEV*), and baseline age in years (*AGE*). The *P_ACHIEV* predictor was entered into the model centered at its mean. Specifically, we formulated the following level-2 model:

$$\pi_{0ij} = \beta_{00j} + \beta_{01j} GEN_{ij} + \beta_{02j} P\_ACHIEV_{ij} + \beta_{03j} AGE_{ij} + r_{0ij},$$
$$\pi_{1ij} = \beta_{10j} + r_{1ij},$$
$$\pi_{2ij} = \beta_{20j} + r_{2ij},$$
$$\pi_{3ij} = \beta_{30j}, \pi_{4ij} = \beta_{40j}, \pi_{5ij} = \beta_{50j}, \pi_{6ij} = \beta_{60j}.$$

where, β_{00j} represents the average *CS* level within class *j* at time *L* (i.e., at week 6), β_{01j} indicates whether boys and girls differ in their *CS* average within class *j* after controlling for prior achievement and baseline age, β_{02j} represents the differentiating effect of prior achievement in the *CS* average within class *j* after controlling for gender and age at baseline, and β_{03j} represents the differentiating effect of age in the *CS* average within class *j* after controlling for gender and prior achievement. In

addition, r_{0ij} indicates whether students nested within class *j* differed in their expected outcome at time *L*, r_{1ij} indicate whether students nested within class *j* differed significantly in their rate of change at time *L*, r_{2ij} indicates whether students nested within class *j* differed significantly in their rate of deceleration. Note that the interpretation of the quadratic coefficient does not depend of centring for time. The results suggested the need to retain the main effects of time-invariant predictors *GEN* and *P_ACHIEV* in the level-2 model but treat them as fixed rather than allowing them to randomly vary across level-3 clusters.

Next, we explored whether students nested within classes receiving training for *CS* during 12 weeks began at a different level, or progressed over time at a different rate of growth and acceleration, than those who did not receive training. Thus, the level-3 model incorporated the treatment conditions, the explanatory variable of major interest in the current research. As mentioned previously, in our study 20 classes were randomized in groups of five to either a control, week-journal (*WJ*), self-regulated strategy development (*SRSD*), or *SRSD+SRL* condition. In the analysis, these four groups were compared using Helmert contrasts. Specifically, the contrast coefficients for the three group-related Helmert contrasts are: H_1 = c (-1, 1/3, 1/3, 1/3), H_2 = c (0, -1, 1/2, 1/2), and H_3 = c (0, 0, -1, 1). The first Helmert contrast involves a comparison of subjects randomized to control versus some form of treatment. The second Helmert contrast implies to compare subjects randomized to *WJ* versus some form of *SRL*, while the goal of the third Helmert contrast is to compare the subjects randomized to *SRSD* versus *SRSD + SRL*..

This model is defined by

$$\beta_{00j} = \gamma_{000} + \gamma_{001} H_{1j} + \gamma_{002} H_{2j} + \gamma_{003} H_{3j} + u_{00j}$$
$$\beta_{10j} = \gamma_{100} + \gamma_{101} H_{1j} + \gamma_{102} H_{2j} + \gamma_{103} H_{3j} + u_{10j},$$
$$\beta_{20j} = \gamma_{200} + \gamma_{201} H_{1j} + \gamma_{202} H_{2j} + \gamma_{203} H_{3j} + u_{20j},$$
$$\beta_{30j} = \gamma_{300}, \beta_{40j} = \gamma_{400}, \beta_{50j} = \gamma_{500}, \beta_{60j} = \gamma_{600},$$
$$\beta_{01j} = \gamma_{010}, \beta_{02j} = \gamma_{020},$$

where γ_{000} is the overall mean intercept in the four treatment conditions at time *L*, γ_{001} is the difference between the control and treatment groups in the mean response at time *L*, γ_{002} is the difference between the *WJ* and some form of *SRL* groups in the mean response at time *L*, γ_{003} is the difference between the *SRSD* and *SRDS+SRL* groups in the mean response at time *L*, γ_{100} is the mean slope, or rate of change in the mean response over time in four treatment conditions, $\gamma_{101}$is the

difference between the control and treatment groups in the rate of change in the mean response over time, γ_{102} is the difference between the *WJ* and some form of *SRL* groups in the rate of change in the mean response over time, γ_{103} is the difference between the *SRSD* and *SRS+SRL* groups in the rate of change in the mean response over time, γ_{200} is the rate of acceleration in the mean response over time in the four treatment conditions (a measure of the upward or downward curve), γ_{201} is the difference between the control and treatment groups in the rate of acceleration in the mean response over time, γ_{202} is the difference between the *WJ* and some form of *SRL* groups in the rate of acceleration in the mean response over time, is the difference between the *SRSD* and *SRS+SRL* groups in the rate of acceleration in the mean response over time, and u_{00j}, u_{10j} and u_{20j} are the level 3 residuals allowing class *j*'s subjects to deviate from population averages.

By substitution, a single regression equation for the three-level growth model is given by

$$
\begin{aligned}
CS_{tij} = {} & \gamma_{000} + \gamma_{001} H_{1j} + \gamma_{002} H_{2j} + \gamma_{003} H_{3j} + \gamma_{010} GEN_{ij} + \gamma_{020} P\_ACHIEV_{ij} + \\
& \gamma_{100}(TIME_{tij} - L) + \gamma_{200}(TIME_{tij} - L)^2 + \gamma_{300} AE\_W_{tij} + \gamma_{400} AR\_W_{tij} + \\
& \gamma_{500} AT\_W_{tij} + \gamma_{600} AR\_W_{tij} \times (TIME_{tij} - L) + \gamma_{101} H_{1j} \times (TIME_{tij} - L) + \\
& \gamma_{102} H_{2j} \times (TIME_{tij} - L) + \gamma_{103} H_{3j} \times (TIME_{tij} - L) + \gamma_{201} H_{1j} \times (TIME_{tij} - L)^2 + \\
& \gamma_{202} H_{2j} \times (TIME_{tij} - L)^2 + \gamma_{203} H_{3j} \times (TIME_{tij} - L)^2 + u_{10j}(TIME_{tij} - L) + \\
& r_{1ij}(TIME_{tij} - L) + u_{10j}(TIME_{tij} - L)^2 + r_{1ij}(TIME_{tij} - L)^2 + u_{00j} + r_{0ij} + e_{tij}.
\end{aligned}
$$

which illustrates that the *CS* may be viewed as a function of the overall intercept (γ_{000}), the effect of the comparison $H_1(\gamma_{001})$, the effect of the comparison $H_2(\gamma_{002})$, the effect of the comparison $H_3(\gamma_{003})$, the effect of student's $GEN(\gamma_{010})$, the effect of student's $P\_ACHIEV(\gamma_{020})$, the linear effect of *TIME* (γ_{100}), the quadratic effect of *TIME* (γ_{200}), the effect of self-efficacy for writing $SE\_W(\gamma_{300})$, the effect of regulation in writing $SR\_W(\gamma_{400})$, the effect of attitude toward writing $AT\_W(\gamma_{500})$, and the interaction effects, SR_W by *TIME* (γ_{600}), H_1 by *TIME* (γ_{101}), H_2 by *TIME* (γ_{102}), H_3 by *TIME* (γ_{103}), H_1 by *TIME*^{2} (γ_{201}), H_2 by *TIME*^{2} (γ_{202}), and H_3 by *TIME*^{2} (γ_{203}), plus a random error: $(u_{10j} + r_{1ij}) \times TIME_{tij} + (u_{20j} + r_{2ij}) \times TIME^2{}_{tij} + u_{00j} + r_{0ij} + e_{tij}$. The variables u_{00j}, u_{10j} and u_{20j} are random class effects associated with intercept, linear time slope, and quadratic time slope, respectively; r_{0ij}, r_{1ij} and r_{2ij} are random effects for clustering of students within classes

associated with intercept, linear time slope, and quadratic time slope, respectively; and e_{tij} represents a residual

Consistent with common practice in multilevel modeling, we assume that the random effects associated with classes are independent of the random effects associated with students nested within classes, and that all random effects are independent of the level 1 random components. It is also assumed that the residuals are normally distributed with zero means and uncorrelated with respective right-hand covariates. Multilevel analysis were conducted by fitting a variance components structure with parameters estimated by the full maximum likelihood (ML) estimation as implemented in PROC MIXED of SAS/STAT® 9.4 (2013).

5.3 Results

5.3.1 Descriptive analyses

Before starting the analysis, we examined the distribution of the data of the different samples for the outcome variable (composition skills) and time-dependent covariates (i.e., *AE_W*, *AR_W* and *AT_W*). The extent of variations weekly of skewness and kurtosis for the variables included in the model, as well as the means and standard-deviations are presented in Table 5.1. As show in this table, the skewness values are generally within the range (i.e., $\pm$ 1) of what is considered a reasonable approximation to the normal curve. Looking at the kurtosis, it is necessary to note that depending on what time on which measurements are made, the variables are very slightly platykurtic (i.e., its peak is just a bit shallower than the peak of a normal distribution) or very slightly leptokurtic (i.e., its central peak is just a bit higher than the peak of a normal distribution). As a result, it can be concluded that the values for skewness and kurtosis remain within allowable limits for all the time periods, so we proceed with the analysis.

Table 5.1 *Descriptive statistics of written composition skills and time-varying covariates across time*

						Week						
CS_W	0	1	2	3	4	5	6	7	8	9	10	11	12
N	364	363	366	366	362	366	365	366	365	362	365	366	364
Mean	50.47	50.07	52.47	53.01	53.62	52.94	54.61	53.98	54.95	55.83	56.78	58.38	58.66
STD	8.35	8.44	8.91	8.04	8.47	9.32	7.41	8.37	7.80	7.95	7.02	6.89	7.09
SK	-.45	-.16	-.18	-.28	-.46	-.99	-.42	-.65	-.81	-.43	-.57	-.55	-.81
KUR	.67	.49	-.39	.36	.34	.58	.01	.02	.10	-.40	.02	-.16	.85
						Week							
AE_W	0	1	2	3	4	5	6	7	8	9	10	11	12
N	364	363	366	366	362	366	365	366	365	362	365	366	364
Mean	2.30	2.27	2.29	2.31	2.36	2.41	2.45	2.57	2.59	2.73	2.79	2.88	2.97
STD	.43	.43	.42	.51	.47	.45	.42	.52	.59	.65	.68	.71	.71
SK	.11	.05	.27	.29	.28	-.24	-.12	.28	.19	.11	.21	-.02	-.22
KUR	.58	.39	1.54	.55	1.13	-.06	.62	.06	-.37	-.54	-.70	-.99	-.98
						Week							
AR_W	0	1	2	3	4	5	6	7	8	9	10	11	12
N	364	363	366	366	362	366	365	366	365	362	365	366	364
Mean	3.82	3.96	4.07	4.20	4.26	4.25	4.27	4.30	4.29	4.31	4.30	4.29	4.31
STD	.61	.67	.68	.67	.69	.73	.64	.70	.75	.69	.71	.72	.72
SK	-.24	-.81	-.87	-.93	-1.02	-.96	-1.10	-.89	-1.11	-1.06	-1.09	-.91	-.86
KUR	-.44	.44	.61	.41	.82	.34	.88	.58	1.11	.82	-1.09	.24	.05
						Week							
AT_W	0	1	2	3	4	5	6	7	8	9	10	11	12
N	364	363	366	366	362	366	365	366	365	362	365	366	364
Mean	2.77	2.77	2.86	2.90	2.90	2.99	3.02	3.02	3.10	3.10	3.15	3.13	3.18
STD	.59	.62	.60	.63	.61	.63	.60	.64	.58	.61	.62	.64	.68
SK	-.24	-.23	-.41	-.52	-.38	-.45	-.49	-.65	-.61	-.56	-.60	-.63	-.76
KUR	-.44	-.39	.03	.05	-.17	-.33	.18	.00	-.08	-.15	-.10	-.09	-.05

Note. N = sample size; STD = Standard deviation; SK = Skewness; KUR = Kurtosis; CS = Written composition skills per week; AE_W = Self-efficacy for writing per wee; AR_W = Self-regulation in writing per week; AT_W = Attitude toward writing per week.

5.3.2 Multilevel analyses

Selecting the best model

To address the different goals of our study (i.e. compare the performance of subjects receiving training in writing skills with the performance of subjects with no training, verify whether all treatments have the same effectiveness, and determine which of two self-regulated treatments is more effective), will be begun selecting the best linear mixed model to the *CS* use data. Tables 5.2 and Table 5.3 present the results of fitting an eight growth curve models for change to the *CS* data using full ML in SAS PROC MIXED. Usually, each model in the taxonomy extends a prior model in some sensible way. Table 5.2 summarize the results for five multilevel models applied to *CS* data. Specifically, the unconditional two-level growth model (A) examines the standard linear change, the unconditional two-level growth model (B) and three-level growth model (C) examines the quadratic change, the conditional three-level growth model (D) examines the effects of the time-varying predictors and their interactions

through time, and the conditional three-level growth model (E) examines the process of adding time-invariant predictors to models. On the other hand, Table 5.3 presents the models that incorporate the effects of treatment conditions, both with and without the heterogeneous variance specifications at level 1.

Table 5.2 *Results of fitting alternative multilevel models for change to the composition skills data*

	Model A		Model B		Model C		Model D		Model E	
Fixed Effect	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Mean	54.289***	.307	54.099***	.364	54.139***	.955	54.081***	.951	55.442***	1.179
TIME	.657***	.040	.657***	.040	.640***	.105	.559**	.098	.551***	.096
TIME^2			.014	.008	.018	.019	.019	.019	.019	.018
AE_W							.466*	.193	.464*	.191
AR_W							.727***	.182	.642***	.177
AT_W							.611**	.198	.531**	.193
AE_W × *TIME*							.036	.050	.037	.050
AR_W× *TIME*							-.093*	.042	-.121**	.042
AT_W× *TIME*							-.005	.047	.012	.047
AGE									.064	.332
GEN									.937**	.342
P_ACHIEV									3.160***	.217
Random Effect	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Level-1 (within-subject variance)										
Random error	25.951***	0.579	23.286***	0.564	23.288***	0.564	23.252***	0.545	23.146***	0.543
Level-2 (between students within classes variances)										
6-week status	32.560***	2.555	44.346***	3.581	27.644***	2.413	25.740***	2.283	16.300***	1.573
Linear rate	.453***	.044	.467***	.044	.277***	.031	.257***	.029	0.247***	0.029
Quadratic rate			.015***	.002	.008***	.002	.008***	.002	0.008***	0.002
Level-3 (between-classes variances)										
6-week status					16.468**	5.759	16.415**	5.712	17.122**	5.772
Linear rate					.199**	.070	.165**	.059	.160**	.058
Quadratic rate					.006**	.002	.005**	.002	.005**	.002
Goodness-of-fit										
Deviance	30516.5		30326.7		30011.4		29960.6		29441.1	
AIC	30528.5		30346.7		30043.4		30004.6		29495.1	
BIC	30552.0		30385.7		30059.3		30026.6		29516.0	

Note: *p < .05; **p < .01; ***p < .001

To facilitate the selection of best model, first we describe the results (not shown in the table due to space) corresponding to the unconditional means model (i.e., a no-change trajectory model). The estimated outcome grand mean across all occasions and students is 54.29 ($p < .001$), which suggests that between the first and the twelfth week, the average *CS* is non-zero. Examining the variance components, we found statistically significant variability both within-students (31.55, $p < .001$) and between-students (39.37, $p < .001$). We concluded that *CS* outcome varies from week to week and that students differ from each other.

To determine whether the unconditional means model is preferable to Model A, we tested the compound null hypothesis on a set of differences between models (e.g., regarding the linear growth rate, its associated variance components and covariance between slope and intercept - this term is not shown in the table due to space). The difference in deviance statistics, (31830.5-30516.5) = 1314, far exceeds 16.27, the 0.001 critical value of a χ^2 distribution on 3 degrees freedom (*df*), allowing to reject the null hypothesis (H_0) at the $p < .001$ level stating that all the three parameters are simultaneously 0. Hence, the unconditional two-level growth model provides a better fit than the unconditional means model. Do we need go further or perhaps parsimonious Model A may be chosen as the best fit model? Comparison of Models B and A suggest that response is yes. Comparing deviance statistics for pair of nested models yields a difference of 189.8. As this exceeds the .001 critical value of a χ^2 distribution on 4 *df* (18.46), we reject the H_0. We conclude there is potentially predictable variation in acceleration rate across students. For Model B, although the variance for quadratic component of change (r_{2i}) is statistically significant ($p < .001$), its associated fixed effect ($TIME^2$) is not. The tests associated with the random acceleration parameter indicate that there is substantial variation in the quadratic rates across students. The test for the fixed effect tells us that the average value of these rates is indistinguishable from 0. Thus, the trend across time is essentially linear at the population level but curvilinear at the individual level.

Then we compared the unconditional quadratic three-level Model C to the unconditional quadratic two-level Model B. Because students are nested within classes and these can vary considerably among themselves, a three-level model of level-1 occasions nested within level-2 students nested within level-3 classes will also be used to analyze this clustered longitudinal design. As there are only 20 classes, *CS* dataset is not ideal for building a three-level growth model, but it can still be useful for descriptive purposes. As indicated in Table 5.2, the deviance statistics and number of estimated parameters for the unconditional Model C were 30011.4 and 16, respectively. The likelihood ratio test

comparing the Model C to Model B yields a deviance difference statistically significant at any alpha level we might reasonably select (30326.7-30011.4 = 315.3, with 6 *df*, p < .001), indicating that more complex provides the better fit. Each information criterion is consistent with that judgment.

Because we seek a level-1 individual growth model that describes the fundamental structure of these data, we included not just the additional time-varying predictors and interactions among level-1 predictors and *TIME* (i.e., *AE_W*, *AR_W*, *AT_W*, *AE_W* × *TIME*, *AR_W* × *TIME*, and *AT_W* × *TIME*) but also the required additional variance and covariance components (see Model D). Although not shown in the Table 5.2, the covariance components were not constrained to be 0. When comparing the Model D with the Model C, there is significant evidence that the model that incorporates the main effects of time-dependent covariates and interactions fits better. Here the difference in deviances is (30011.4-29960.6) = 50.8; $df = 6$, $p < 0.001$. Having identified an appropriate level-1 model, we included the additional effects of time-invariant predictors into level-2 model (i.e., *AGE*, *GEN* and *P_ACHIEV*). For Model E (i.e., model that incorporates time-varying predictors, time-invariant predictors, and the level-1 interactions), the deviance statistic was 29441.1 with 25 *df*. For Model D (i.e., model that only incorporates time-varying predictors and the level-1 interactions), it was 29960.6 with 22 *df*. As a result, the likelihood ratio test statistic was 518.5 with 3 *df* ($p < .001$), which provides strong evidence for Model E. Although the Model E provides a more realistic representation of the pattern of change in *CS* scores than Model D, the Model E contain terms that are not necessarily required. In this paper an even more parsimonious Model F will be assessed. Model F is a simplification of Model E in which the main effect of *AGE* and non-significant level-1 interaction terms are removed. Comparing the last two models each other, we find a trivial difference in deviance of 0.7 on 3 *df*, showing that the elimination of *AGE*, *AE_W* by *TIME* and *AT_W* by *TIME* has hardly changed the goodness of fit.

After appropriate model selection at level-2 for the *CS* use data, we examined the performance of subjects receiving training in writing skills with the performance of subjects who did not receive such training, and the performance of participants receiving treatment in different modalities. Model G of Table 5.3 presents the results of fitting this model to data. The final conditional model (Model G) included three class-level variables (i.e., the aforementioned set of Helmert contrasts for group), two student-level variables (*GEN* and *P_ACHIEV*) and five within level-1 repeated observations (*TIME*, $TIME^2$, *AE_W*, *AR_W* and *AT_W*). The cross-product between *SR_W* and *TIME* and cross-level interaction term H_1 by linear *TIME* (i.e., difference between the control and treatment groups across time) are also included in the Model G. From Table 5.3 we can see that adding the three group-related Helmert

contrasts (i.e., H_1, H_2 and H_3) and cross-level interaction between H_1 and *TIME* to the model decreases the deviance from 29441.8 to 29407.5, a decrease of 34.3. This change in deviance is tested at 4 *df* using the χ^2 statistic and is found to be significant.

Table 5.3 *Results of fitting alternative homogeneous and heterogeneous level-1 variance models for change to the composition skills data*

	Model F		Model G				Model H			
Fixed Effect	Estimate	SE	Estimate	SE	DF	/t/	Estimate	SE	DF	/t/
Intercept, $\hat{\gamma}_{000}$	53.672***	.970	53.670***	.590	16	90.90	53.710***	.593	16	90.56
TIME, $\hat{\gamma}_{100}$	.591***	.096	.553***	.088	4670	6.28	.552***	.088	4670	6.26
TIME^2, $\hat{\gamma}_{200}$	.021	.018	.022	.018	4670	1.21	.022	.018	4670	1.26
AE_W, $\hat{\gamma}_{300}$	.494*	.186	.469*	.187	4670	2.51	.390*	.183	4670	2.14
AR_W, $\hat{\gamma}_{400}$	.639***	.177	.647***	.179	4670	3.65	.660***	.178	4670	3.72
AT_W, $\hat{\gamma}_{500}$	.553**	.192	.517**	.192	4670	2.69	.604**	.190	4670	3.17
AR_W×*TIME*, $\hat{\gamma}_{600}$	-.116**	.040	-.120**	.040	4670	2.96	-.137***	.039	4670	3.48
GEN, $\hat{\gamma}_{010}$	.926**	.342	.933**	.341	4670	2.74	.849*	.338	4670	2.51
P_ACHIEV, $\hat{\gamma}_{020}$	3.154***	.216	3.155***	.217	4670	14.59	3.139***	.215	4670	14.63
H_1, $\hat{\gamma}_{100}$			5.168***	.799	16	6.47	5.165***	.803	16	6.44
H_2, $\hat{\gamma}_{200}$			1.695**	.587	16	2.89	1.738**	.579	16	3.01
H_3, $\hat{\gamma}_{300}$			.716	.508	16	1.42	.709	.506	16	1.40
$H_1 \times$ *TIME*, $\hat{\gamma}_{101}$			.274	.149	4670	1.83	.272	.150	4670	1.81
Random Effect	Estimate	SE	Estimate	SE			Estimate	SE		
Homogeneous Level-1 variance (within-subject)										
Random error, $\hat{\sigma}^2$	23.159***	0.545	23.158***	0.545						
Heterogeneous Level-1 variances (within-subject)										
Random error (Control), $\hat{\sigma}_1^2$							29.994***	1.333		
Random error (WJ), $\hat{\sigma}_2^2$							14.270***	.664		
Random error (SRSD), $\hat{\sigma}_3^2$							27.159***	1.259		
Random err (SRSD/SRL), $\hat{\sigma}_4^2$							22.714***	1.049		
Level-2 (between students within classes variances)										
L-status, $\hat{\tau}_{\pi 00}$	16.294***	1.573	16.308***	1.576			15.914***	1.554		
Linear rate, $\hat{\tau}_{\pi 11}$	0.246***	0.029	.245***	.029			.222***	.028		
Quad rate, $\hat{\tau}_{\pi 22}$	0.008***	0.002	.008***	.002			.007***	.002		
Level-3 (between-classes variances)										
L-status, $\hat{\tau}_{\beta 00}$	17.113**	5.768	5.261**	2.108			5.356**	2.122		
Linear rate, $\hat{\tau}_{\beta 11}$	.160**	.058	.131**	.048			.133**	.048		
Quad rate, $\hat{\tau}_{\beta 2}$	.005**	.002	.005**	.002			.005**	.002		
Goodness-of-fit										
Deviance	29441.8		29407.5				29275.4			
AIC	29485.8		29459.5				29333.4			
BIC	29507.7		29485.3				29362.3			

Note: *p < .05; **p < .01; ***p < .001

It might appear, then, that Model G is preferable. But before proceeding to examine Model G in depth, make sense to considerer the possibility that the residual variances at level 1 depends on

treatment groups (see, Vallejo, Fernández, Cuesta, & Livacic-Rojas, 2015 for more details). Returning to Figure 5.1, we note that participants display considerable heterogeneity across the groups. Thus, we might hypothesize that residual variance at level 1 in these data is different for conditions. Table 5.3 presents estimates for homogeneous variances (Model G) and for heterogeneous variances that occurs at level-1 (Model H). The likelihood ratio test comparing Model G to Model H, shows that the deviance declines by 132.1 (29407.5-29275.4), which far exceeds the .05 critical value of a χ^2 distribution on 3 *df*. We therefore reject the null hypothesis that all four variances are equal and conclude that the heterogeneous model fit these data better than the simple homogeneous level-1 specification. For this reason, we adopt Model H as our "final model". The same table shows that the information criteria also lead to the conclusion to choose Model H, supporting the hypothesis that the residual variance varies across classes differently for the groups. The AIC (BIC) weight of this model (> 0.97) implies that there is a high probability that this is the best model among all of the examined models.

Analysis of the selected multilevel model

Once selected a suitable final model, we first consider the results for the fixed effects corresponding to Model H of Table 5.3. Comparing the regression coefficients we see that the constant $(\hat{\gamma}_{000} = 55.408;\ p < 0.001)$ and linear trend terms $(\hat{\gamma}_{201} = 0.552;\ p < 0.001)$ are significant. The intercept being significant is not particularly meaningful; it just indicates that *CS* scores are different than zero at midpoint of time. However, because the trend is essentially linear at the population level, participants are improving across time. On the contrary, the quadratic term is nonsignificant at the population level $(\hat{\gamma}_{200} = 0.022;\ p = 0.208)$. Similar inspection of the other parameter estimates in Model H shows that *CS* score was positively associated with prior achievement $(\hat{\gamma}_{020} = 3.139;\ p < 0.001)$, self-efficacy for writing $(\hat{\gamma}_{300} = 0.390;\ p < 0.027)$, self-regulation in writing $(\hat{\gamma}_{400} = 0.660;\ p < 0.001)$ and attitude toward writing $(\hat{\gamma}_{500} = 0.604;\ p < 0.002)$. On the other hand, CS sore was negatively associated with the cross-product between the self-regulation and linear time $(\hat{\gamma}_{600} = -0.137;\ p < 0.001)$. The relationship between the self-efficacy and attitude toward writing and the *CS* score was constant across time (i.e., no time interactions with these time-varying covariates, see Model D in Table 5.2). We have also found that the gender effect was significant $(\hat{\gamma}_{010} = 0.849;\ p < 0.012)$, suggesting that performance in *CS* for girls was somewhat higher than for boys.

At class level, of primary interest in Model H are the estimates of γ_{001}, γ_{002}, γ_{003}, and γ_{101}, and their estimated standard errors. Table 5.3 indicates that the difference between the control and treatment groups in the mean response at the midpoint of time is significantly different from zero $(\hat{\gamma}_{001} = 5.165,\ p < .0001)$. This leads to the conclusion that the intervention had a statistically significant effect on *CS* score. In addition, due to the effect of cross-level interaction between H_1 and linear *TIME* is seen to be marginally significant $(\hat{\gamma}_{101} = 0.272,\ p = 0.068)$, it seems that this benefit increases across time. To determine if a differential performance in the mean response *CS* had occurred in the intervention *WJ* group relative to some form of *SRL* groups, we will inspect the regression coefficients of the H_2 contrast. In Model H the effect of γ_{002} is estimated to be 1.738 while its corresponding standard error is estimated to be 0.579. The ratio is 3.01 and the *p*-value is approximately 0.008, which indicates a significant benefit for participants who receive some form of self-regulating treatment (i.e., *SRSD* or *SRSD* + *SRL*) relative to participants of *WJ* group at the midpoint, and further suggests that this effect does not vary significantly across time (i.e., no time interactions with the second and third Helmert contrasts). Finally, regarding H_3, there was no evidence to suggest that improved performance in *CS* scores between *SRSD* and *SRSD* + *SRL* intervention conditions $(\hat{\gamma}_{003} = 0.709;\ p = 0.179)$, although performance is greater in the group SNSD + SRL.

Turning, to the variances estimates, we see that at the student-level the estimate constant variance $(\hat{\tau}_{\pi 00})$ is much larger than the estimate linear trend component $(\hat{\tau}_{\pi 11})$, which is much larger than the estimated quadratic trend component $(\hat{\tau}_{\pi 22})$. In terms of relative percentages, these three represent 98.5, 1.4, and 0.1, respectively, of the sum of the estimated individual variance terms. A similar result is observed at the class level $(\hat{\tau}_{\beta 00}, \hat{\tau}_{\beta 11},$ and $\hat{\tau}_{\beta 22})$, although heterogeneity in trends across time become smaller as the order of trend terms increase. Note also that final estimation of level-1 and level-2 variance components has been affected very little by model respecification (Model F *vs*. Model G/H). However see that final estimation of level-3 variance components has been substantially diminished when compared with the parameters estimates for Model G/H.

5.4 Discussion

In this study, using a longitudinal cluster-randomized controlled design, we examined the impact of three types of writing interventions (i.e., week-journals, SRSD, SRSD plus a SRL program using a story-tool) on the quality of writing compositions. Moreover, to analyze the effects of the four intervention conditions on writing composition skills, a set of covariates were controlled, namely self-regulation in writing, self-efficacy beliefs, attitude towards writing, prior achievements in writing, gender and age. These variables have been selected because previous findings had suggested their positive effects on students' writing quality.

The current research contributes to literature due to three major aspects. To our knowledge this is the first study that examined the benefits of a free writing activity (i.e., week-journals) comparing to other two instructional programs. Moreover, this study innovates by adding a story-tool that enhances self-regulation learning to the SRSD model. Lastly, this study compares three types of writing intervention by conducting a longitudinal cluster-randomized controlled design using a multilevel modeling analysis.

To further understand and contextualize our findings we conducted a qualitative analysis on the notes of the teachers' perspectives of their experience during the research shared on the post-intervention evaluation meeting (see, McInerney, 2012; Rosário, Núñez, Vallejo, Cunha, Nunes, Mourão et al, 2015; Rosário, Núñez, Vallejo, Cunha, Nunes, Suárez et al., 2015). The discussion of these findings will be limited, still may help to interpret findings and open new avenues for research

5.4.1 The effectiveness of writing interventions on writing quality

The results herein obtained support the hypothesis initially formulated by showing differences between the treatment groups in students' writing quality over time, still with some reserves. Firstly, it was found that the students enrolled in the three intervention groups exhibited higher levels of writing quality in their composition when compared to those of students with no intervention (i.e., comparison group). These findings allow concluding that all writing intervention groups showed a positive and significant impact on students writing quality, which increased along the intervention time. These findings are consistent with literature that reports the benefits of writing journals (Rosário et al., submitted), of participating in instructional writing programs as SRSD (e.g., Glaser & Brunstein, 2007; Graham, McKeown et al., 2012; Harris et al., 2015; Graham et al., 2005; Graham & Perin, 2007;

Rogers & Graham, 2008), and of participating in SRL training programs using story-tools (Núñez et al., 2011; Núñez et al., 2013; Rosário, Núñez, Azevedo et al., 2014; Rosário et al., in press; Rosário, Núñez, Trigo et al., 2015). Moreover, it was observed that the evolution of the writing quality of the three intervention groups was, overall, essentially linear and positive, indicating that a more constant acquisition of writing skills occurred over time.

Secondly, it was found that students who participated in the instructional programs (i.e., SRSD and SRSD plus a SRL program using a story-tool) exhibit higher writing quality than that of students who wrote week-journals. Furthermore, Figure 5.2 also shows that writing week-journals achieved a plateau effect after three weeks, however writing quality of students in the two instructional programs continue to grow after that period. These findings are aligned with Rosário et al. (submitted) assumption that, in order to master higher levels of writing skills and to overcome the plateau effect it would be necessary to enrol in instructional writing programs. These results are also consistent with the meta-analysis which found that studies involving strategy instruction using the SRSD model produced a statistically positive effect on students' writing quality with an effect size (ES) of 1.17 in average (Graham, McKeown et al., 2012). Students who were involved in free writing activities (e.g., writing about a free topic) produced an average weighted ES of 0.30 (Graham, McKeown et al., 2012).

Regarding the two instructional programs, it was expected that the last group (i.e., SRSD plus story-tool) would exhibit the highest writing quality scores, given the effectiveness known of the usage of story-tools in promoting students' SRL (e.g., Núñez et al., 2011; Rosário, Núñez, Azevedo et al., 2014). Still, contrary to expectations, no statistical evidence was found in favour of that hypothesis. Students' participating in SRSD plus story-tool intervention showed a higher writing quality than their colleagues in SRSD, however the differences were not statistical significant. This finding may be due to the fact that the SRSD model teaches self-regulation strategies focused on writing of compositions (e.g., goal setting, self-assessment) (see Graham et al., 2005; Harris & Graham, 1996; Harris, Graham, & Mason, 2003). Notwithstanding, at the post-intervention evaluation meeting, teachers of the condition SRSD plus story-tool intervention, enthusiastically shared their students' scores in the composition section in the national standardized exam in Portuguese language, which counts thirty points to the overall grade. As this issue was brought to discussion, we asked the teachers of the other conditions whether they would

like to share the results of their students[1]. Globally, participant teachers in conditions B, C and D were very happy with their students' writing performance that far exceeded their expectations. In fact, the compositions scores, were higher than those obtained in the previous years. Other teachers in the condition SRSD plus story-tool intervention noticed that students' anxiety towards writing diminished over time. "my students usually tried to avoid writing. *I don't know what to write...it's very difficult...* they complained while swinging on their chairs and playing with their pencils. Throughout the program, I started to see that they were less anxious and when they did their exam, they were a lot more confident..." Other teacher added "They [students] said to me... (laughs) "Yellow will help me! I'll use all the steps that he taught me". These teachers' quotations highlight the impact of the usage of the story-tool on other students' variables that were not the focus of the current study. Still, these ancillary findings are consistent with literature that reports negative and significant relationships between SRL learners and assessment anxiety (e.g., Jain & Dowson, 2009; Pekrun, Goetz, Titz, & Perry, 2002; Pintrich & Groot, 1990).

5.4.2 The effects of the covariates in writing quality

For what concerns the covariates assessed in this study, the results herein obtained have supported the need and usefulness of accounting for every single covariate (i.e., self-regulation in writing, the self-efficacy beliefs, the attitude towards writing, the prior achievements in writing, the gender and the age), as they were found to have a positive impact on the writing quality observed at the end of the instructional program. Accordantly, as previous studies focusing on writing have stated, when students receive training in SRL strategies they are more likely to produce texts with more quality (e.g., Flower & Hayes, 1981; Bereiter & Scardemalia, 1987; Glaser & Brunstein, 2007), to engage deeply in school tasks and show higher academic achievement (Rosário, González-Pienda et al., 2010). Furthermore, when students' show a positive attitude towards writing (Graham et al., 2007) and perceive themselves as more self-efficacious in writing, they are more likely to show signs of good writing quality and invest more effort while carrying out a writing task (Graham et al., 2007; Pajares & Valiente, 2006; Pajares et al., 2007). More specifically, it was found that the prior achievement in

[1] Scores obtained in the composition section in the national standardized exam in Portuguese language by each treatment condition. Scores ranges between 5 and 30 points (*M*=18.68, *SD*= 5.46) in the comparison group, between 10 and 30 points (M=19.24, SD=3.88 in the Week-journals group; between 11 and 29 points (*M*=20.35, *SD*=4.99) in the SRSD group and between 12 and 30 points (*M*=23.82, *SD*=4.02) in SRSD plus story-tool. Percentage of students that had lower than 15 points (negative scores) per condition: 17%, 10%, 10% and 2%, respectively.

writing composition seems to be the variable with more influence on writing composition skills. Nevertheless, a positive relationship between each moderate variable and the writing composition performance was observed, except between the self-regulation skills and time, which were found to have a negative impact, indicating that the levels of self-regulation tend to be less predictive of the writing composition skills with time. This may be explained by the fact that all groups tend to match, with time, their self-regulation skills as consequence of their engagement in this study. Finally, it was observed that the improvements achieved by girls were greater than those of boys. This supports previous research that have shown that girls are better writers than boys presenting higher scores in writing quality (e.g., Festas et al., 2015; Graham, 2006; Olinghouse, 2008).

5.5 Conclusions and implications

Globally, the improvement of students' writing quality throughout time is related to the level of specialization of the writing intervention implemented. This is an important finding with strong implications for educational practice. For example, the week-journals writing activity can be easily implemented in classrooms by teachers without much effort, time, and resources (e.g., Rosário et al., submitted), providing teachers an opportunity to promote their students' writing quality. Thus, school administrators, teachers, and parents may consider the usage of week-journals as a regular writing activity for all children as a preventive approach to writing difficulties. As students' writing difficulties persist, instructional writing programs as SRSD may be implemented in order to overcome broader or severe difficulties. This is centered in a Response to Intervention (RTI) model, where exists tiers of intervention (i.e., levels), that starts from a more general and preventive interventions with larger number of students in full range class and goes through to more a more intensive and individualized level (e.g., Harris et al., 2015).

Regarding the treatment conditions of the current study, the SRSD plus story tool condition could be framed as a more intensive level of intervention with struggling writers. Although data did not show statistical significant differences between results from SRSD and SRSD plus story tool condition, it would be useful to conduct further research on instructional writing interventions using story-tools. As stated previously, teachers in the post-research meeting informed about students' scores in the composition of a standardized exam, which were very encouraging. Furthermore teachers also said with satisfaction that their students not only improved their writing but also improved in other domains. As

the majority of the participating teachers stated in the post-research evaluation meeting, *"students started to use PLEE for everything since planning their games in the playground or the steps to solve a difficult math problem to evaluate the cake baked at home or at school"* (T_{11}). Other participants added that they felt that their students started to enjoy learning and were more motivated to learn and to write, mainly the struggling students.

Despite the promising contributions referred, further research is needed to disclose the benefits of the usage of the story-tool in combination with writing instruction. It is possible that the instruments and measures used in our study did not capture the benefits and potential of the story-tool to improve writing quality, this possibility opens new avenue for future research (e.g., analyzing other outcome measures as anxiety towards writing). Moreover, given the insight provided by the data collected in the post-research meeting, future studies may explore in depth the complex process of learning writing strategies in combination with story-tool, using qualitative methods to analyze students' and teachers' experiences during the program.

Furthermore, our findings indicated that students' writing quality in the two instructional conditions increased throughout the end of the study. It would be relevant to conduct studies with a longer duration to learn the efficacy of these programs to promote the writing quality throughout time.

Finally, our results suggest that the usage of this tool facilitate the comprehension and application of the writing strategies taught, using the PLEE model explained by the characters of the story, hence school administrators and teachers could consider using story-tools to foster writing instruction.

5.6 References

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5.7 Appendix

<table>
<tr><td>Assessment /Sessions</td><td colspan="2">Sessions of the instructional programs</td></tr>
<tr><td></td><td>SRSD (group C)</td><td>SRSD + story-tool (group D)</td></tr>
<tr><td>Session 1</td><td rowspan="2">Stage 1 (4): Develop student's prior knowledge on composition. General writing strategies (i.e., POW) presented are discussed with students. Negative beliefs that students could have about their writing performance are discussed and changed into positive beliefs (e.g., "I can do it, if I use the right strategy").</td><td>Book chapters: 1-3; Students learn some features of the story and meet the learning strategy planning for the first time.</td></tr>
<tr><td>Session 2</td><td>Book chapter: 4; Students are encourage to value the role of effort and commitment in their learning process. Some quotations of the story helped students to change their negative beliefs into positive (e.g., "To learn more and grow wiser depends mainly on what each one does").</td></tr>
<tr><td>Session 3</td><td rowspan="2">Stage 2 (4): Students revisit the general writing strategies (i.e., POW) and discuss the SRL strategies (i.e., self-instructions, goal setting, self-assessment and self-reinforcement) to be used before, during and after writing a story.</td><td>Book chapter: 5; Students analyze the steps of the problem solving process and practice the implementation of those steps using specific tasks.</td></tr>
<tr><td>Session 4</td><td>Book chapter: 6; Students identify, define and apply the three phases of the self-regulatory process (i.e., plan, execute and evaluate) in the context of different daily and learning tasks.</td></tr>
<tr><td>Session 5</td><td rowspan="3">Stage 3 (4): The planning, writing and assessing of compositions using a set of general and SRL strategies taught are modeled collaboratively in class.</td><td>Book chapter: 7; Students are faced with the importance of peer and collaborative work.</td></tr>
<tr><td>Session 6</td><td>Book chapter: 8; Students are asked to describe and to reflect on how the colors identified each of the three phases of the SRL process and on the SRL strategies applied.</td></tr>
<tr><td>Session 7</td><td>Book chapters: 9-10; Students reflect about the characters' emotions and behaviors and identify similar daily life situations. Students learn to foresee and reflect about the consequences of their behavior in short- and long-term.</td></tr>
<tr><td>Session 8</td><td rowspan="3">Stage 5: Strengthened students' ability for independent planning, writing and assessing of stories by using the general and the SRL strategies.</td><td>Book chapters: 11-12; Students are faced with a well-known tale which representatively illustrates the use of the PLEE phases, the importance of self-setting goals and making the effort to accomplish such goals.</td></tr>
<tr><td>Session 9</td><td>Book chapters: 13-14; Students are firstly asked to discuss and reflect about how the characters applied the steps of the problem solving process, and secondly to put those steps into practice independently.</td></tr>
<tr><td>Session 10</td><td>Book chapters: 15 – 17; Students are asked to reflect about how the characters had to take responsibility for their acts and about the importance of effort and commitment to accomplish their main goal (i.e., finding their friend Yellow).</td></tr>
<tr><td>Session 11</td><td colspan="2">Stage 6: Independent performance</td></tr>
</table>

6. CONCLUSÃO GERAL

"Para chegar ao topo de uma árvore, é preciso começar a trepar, mas subindo um ramo de cada vez, era o que nos ensinava o meu avô"

(Capítulo 5, Sarilhos do Amarelo, p. 25)

Esta frase ilustra o princípio que sustenta todo o trabalho constituinte da presente tese. No primeiro "ramo" encontra-se um capítulo de um livro, onde se procurou sintetizar a teoria que alicerça os restantes trabalhos apresentados. O domínio do tema permitiu identificar as lacunas na investigação e refletir sobre possíveis campos de ação no terreno. Neste processo foi possível verificar que as crianças do primeiro ciclo continuam a apresentar severas dificuldades em autorregular a sua aprendizagem com repercussões severas nas suas aprendizagens, variáveis motivacionais e rendimento académico (e.g., Dignath, Buettner, & Langfeldt, 2008). No entanto, as crianças nestas idades são as que mais beneficiam de programas que promovam a aprendizagem de estratégias autorregulatórias (e.g., Perry, Phillips, & Dowler, 2004). No terreno, juntamente com diretores pedagógicos e respetivos professores, concluiu-se que os alunos necessitavam de uma intervenção urgente na promoção de competências de autorregulação, mais especificamente no domínio da escrita de composições. Esta preocupação foi apontada com maior enfâse devido à Prova Final de Português que os alunos realizam no final do 4.º ano de escolaridade.

Assim definiu-se a população-alvo dos estudos realizados nesta tese. Para além disso também se constatou que os professores careciam de formação complementar sobre estratégias de escrita empiricamente validadas e de materiais bibliográficos que apoiassem a sua implementação na sala de aula.

Motivados para dar resposta às necessidades sentidas no terreno, e tendo como base as Metas Curriculares propostas pelo Ministério da Educação para o ensino da escrita no 1.º Ciclo do Ensino Básico (http://www.dge.mec.pt/portugues), subiu-se mais um "ramo" da árvore do *Sarabico*, desenhando um programa de promoção de competências de autorregulação na escrita de composições. Este programa combinou um modelo de intervenção na escrita referido na literatura (e.g., Harris & Graham, 1996) e um programa de promoção da autorregulação da aprendizagem a partir de estórias (e.g., Rosário, Núñez, & González-Pienda, 2007). Ambas as ferramentas têm

evidenciado resultados positivos em cada um dos seus domínios (e.g., Graham, Harris, & Santangelo, 2015; Rosário et al., 2014), e, por isso, o nosso objetivo foi o de juntar o melhor de "dois mundos" e intervir numa necessidade tão premente nas escolas, nomeadamente, portuguesas.

No entanto, na contínua pesquisa bibliográfica identificou-se uma promissora atividade de escrita que até recentemente não tinha sido profundamente estudada: os *week-journals*. Deste modo decidiu-se incluir neste projeto de tese a análise dos benefícios desta ferramenta para a qualidade da escrita de composições. No primeiro estudo compararam-se alunos que escreveram week-journals com alunos que não escreveram week-journals ao longo do tempo. No segundo estudo adicionaram-se mais dois grupos: alunos que participaram num programa de escrita e alunos que para além deste programa também utilizaram uma estória que teve como objetivo equipar os alunos com um conjunto de estratégias autorregulatórias da aprendizagem.

"De asas fechadas ninguém aprende a voar"

(Capítulo 4, Sarilhos do Amarelo, p. 21)

Os dois estudos empíricos desta tese no seu conjunto, ajudaram-nos a perceber que escrever regularmente, ainda que de modo informal, promove significativamente a qualidade da escrita de composições dos alunos, num período relativamente reduzido de tempo. De facto, na segunda semana já nos foi possível verificar diferenças entre os alunos que escreveram *journals* semanalmente e os que não fizerem este tipo de atividade. De facto é preciso praticar ("abrir as asas" e treinar) para escrever melhor ("para voar bem"). Para além disso, segundo a percepção dos professores envolvidos neste estudo, esta atividade traduziu-se num aumento substancial de envolvimento e satisfação na tarefa por parte dos alunos. Os resultados obtidos estimularam a reflexão sobre as práticas atualmente implementadas em sala de aula que podem promover ou minar o envolvimento dos alunos na escrita. Por exemplo, como referido pelos professores na sessão após a intervenção, os alunos estavam habituados a escrever composições com o propósito de avaliação, demonstrando ansiedade perante a tarefa. Contudo, escrevendo *journals*, os alunos sentiram que tinham maior liberdade de expressão e isso conduziu-os a momentos de prazer nas tarefas de escrita.

Para elevar a eficácia desta ferramenta, contrariando o efeito teto identificado após as três semanas, os professores poderiam optar por providenciar feedback aos *journals*, de forma a que os

alunos compreendessem como poderiam melhorar as suas produções escritas. De facto, é bem conhecido na literatura, o impacto positivo bastante poderoso do feedback do professor na performance, autorregulação e noutras variáveis motivacionais dos alunos, como por exemplo, a autoeficácia (e.g., Duijnhouwer, Prins, & Stokking, 2012; Hattie & Timperley, 2007; Nicol & Macfarlane-Dick, 2006; Shunk & Schwartz, 1993). Este benefício do feedback é tanto maior quanto mais informativo/descritivo, personalizado e focado no progresso do aluno (e.g., Brookhart, 2008; Lipnevich & Smith, 2009; Shute, 2008).

No segundo estudo, tal como esperado e evidenciado pela literatura (Glaser & Brunstein, 2007; Graham, Harris, & Mason, 2005; Limpo & Alves, 2013; Fidalgo, Torrance, & Robledo, 2011), os alunos do grupo Self-Regulated Strategy Development (SRSD) melhoram significativamente a qualidade das suas composições. O programa aplicado permitiu-lhes adquirir um conjunto de estratégias a usar antes, durante e após a escrita das suas composições. As mnemónicas introduzidas facilitaram a aprendizagem e a utilização das estratégias. Este conhecimento orientou os alunos na tarefa, pois sabiam exatamente os passos a seguir, facilitando o envolvimento e sustentação dos alunos na escrita, tal como referido por Dunn e Bridwell (1980).

À última condição experimental foi adicionada a leitura e discussão da estória "Sarilhos do Amarelo" (Rosário et al., 2007) que constituiu uma novidade nos programas de intervenção no domínio da escrita. Ancorados nas potencialidades das estórias na aprendizagem, nomeadamente de estratégias de autorregulação (e.g., Rosário et al., 2014), expectava-se que os resultados obtidos nesta última condição fossem superiores relativamente ao grupo anterior. De facto, os resultados dos alunos neste grupo de intervenção foram superiores às restantes condições experimentais, no entanto não revelaram diferenças estatisticamente significativos em relação ao grupo SRSD. Provavelmente, as diferenças entre os dois últimos grupos não se evidenciaram estatisticamente significativas, uma vez que o modelo SRSD já contempla atividades práticas que promovem estratégias de autorregulação centradas na escrita de composições (e.g., Graham, Harris & Mason, 2005; Harris & Graham, 1996). O incremento da estória à condição experimental não melhorou significativamente a qualidade da escrita de composições, tal como demonstrado pelas análises quantitativas. Contudo, a experiência no terreno, assim como as percepções dos professores desta condição, permitiram constatar que a leitura da estória e a discussão das aventuras vividas pelas cores do arco-íris em busca do seu amigo Amarelo facilitaram o envolvimento dos alunos no programa, nomeadamente, dos que detinham maiores

dificuldades na escrita de composições. As experiências vividas pelas cores, muito idênticas às suas, permitiram que os alunos se identificassem com as mesmas, adotando as estratégias utilizadas na escrita das suas composições. Adicionalmente, através da leitura dos vários capítulos da estória, os alunos foram tomando conhecimento, gradualmente, de uma panóplia de estratégias a usar, como e quando (i.e., conhecimentos declarativo, procedimental e condicional). Através da reflexão e realização de atividades práticas, os alunos perceberam a instrumentalidade das mesmas, facilitando a sua motivação e o envolvimento no programa.

Para além disso, os professores dos alunos da última condição experimental partilharam, igualmente com elevado entusiasmo, a pontuação obtida na composição da prova final de Português, que se revelou superior à das condições experimentais anteriores. Poder-se-á concluir que os resultados da prova final, de alguma forma, confirmam a percepção dos professores sobre os benefícios do programa SRSD juntamente com a leitura da estória Sarilhos do Amarelo. Estes dados, no seu conjunto, sugerem que no futuro novas investigações deveriam ser realizadas combinando metodologias quantitativas e qualitativas, de modo a refinar os processos que levam à melhoria da escrita de composições.

Devido à relevância dos estudos empíricos desenvolvidos para a comunidade científica e educativa, surgiu um convite para descrever as sessões passo-a-passo do programa desenvolvido, em formato de *ebook.* Este trabalho consiste num grande contributo para a prática educativa, uma vez que, numa linguagem simples, transmite aos professores como colocar em prática o programa desenhado.

"Não se esqueçam, há um caminho, hipps, há sempre um caminho, hipps, quem não desistir há-de conseguir"

(Capítulo 7, Sarilhos do Amarelo, p. 31)

A melhoria na escrita de composições foi evidente em todos os alunos de todas as condições. No entanto, uns não precisariam de uma intervenção tão específica e outros necessitariam de um apoio mais estruturado e personalizado. A heterogeneidade dos alunos, numa turma, pode levar a que existam diferentes necessidades de intervenção. Para além disso, o campo de ação nas escolas também depende dos recursos existentes. Assim, torna-se fulcral fazer uma boa avaliação das

necessidades, encontrando soluções eficazes para colmatar as lacunas identificadas, na medida em que os agentes educativos consigam suportar.

Neste sentido, as intervenções incluídas neste projeto de tese poderiam ser enquadradas e implementadas numa lógica de *Response to Intervention* (RTI) (e.g., Harris, Graham, & Adkins, 2015) em que, consoante as necessidades dos alunos, seriam implementadas práticas cada vez mais cirúrgicas de intervenção. Por exemplo, os *week-journals* poderiam ser integrados num primeiro nível de ação, em que todos os alunos realizariam esta atividade livre de escrita. De facto, esta prática pode ser implementada facilmente por qualquer professor, uma vez que não exige qualquer formação ou materiais adicionais. Esta atividade apenas exige que o professor planeie em que momentos poderá aplicar a atividade. Os week-journals poderão ser incluídos no currículo como uma atividade de sala de aula ou de Trabalho Para Casa (TPC). Os week-journals como TPC, quando implementados com intencionalidade pedagógica podem servir diversos objetivos relacionados com o desenvolvimento pessoal dos alunos (e.g., promover responsabilidade, autonomia, gestão do tempo, hábitos de trabalho) (Epstein & Van Voorhis, 2001; Rosário et al., 2015), assim como objetivos relacionados com a promoção da qualidade da escrita.

Como se concluiu a partir do primeiro estudo empírico, apesar de todos os alunos incluídos no grupo dos week-journals terem melhorado a qualidade da escrita das suas composições, a melhoria dos alunos que escreviam journals de qualidade mais baixa foi menor. Por exemplo, estes alunos poderiam beneficiar de um programa centrado na promoção de estratégias de escrita, como o modelo SRSD, passando para um nível mais especializado de intervenção (e.g., nível 2). Tal como os trabalhos publicados que avaliaram este programa (e.g., Graham, McKeown, Kiuhara, & Harris, 2012), também os nossos resultados sustentam a eficácia do modelo SRSD para a aquisição de estratégias e processos de autorregulação na escrita.

"O segredo de um final feliz está num início bem pensado, num meio bem executado e no fim bem avaliado"

(Capítulo 10, Sarilhos do Amarelo, p. 49)

Desenhar e aplicar este projeto junto dos alunos das diversas escolas envolvidas, permitiu-me crescer a nível pessoal, mas também muito a nível profissional. Permitiu-me perceber que apesar dos

resultados terem sido bastante positivos e promissores, é necessário continuar a investigar mais e adaptar ou (re)criar novas ferramentas consoante a faixa etária e as necessidades dos alunos e dos seus professores. Esta avaliação e reflexão do projeto desenvolvido para esta tese, iniciou-se aquando da análise e discussão dos resultados obtidos, no sentido de tentar maximizar os efeitos da ferramenta desenhada.

Assim, ainda no último ano de doutoramento, deu-se início ao planeamento e implementação de um novo projeto (execução) que se apresenta como uma extensão do primeiro. Neste projeto incluímos todos os intervenientes fundamentais do processo de aprendizagem (i.e., alunos, professores e encarregados de educação), uma vez que se tratava de duas turmas de 3.º ano de baixo rendimento académico. O programa implementado acrescentou o feedback dado às composições dos alunos, não só de forma quantitativa, mas também de forma qualitativa. Foi pedido que os professores providenciassem aos seus alunos feedback descritivo, não só focando o que era preciso melhorar, mas também, como o fazer. A partir da segunda composição era dado, igualmente, feedback do seu progresso. Esta alteração teve como base a literatura que indica as características de um feedback eficaz (e.g., Brookhart, 2008; Duijnhouwer, Prins, & Stokking, 2012; Hattie & Timperley, 2007; Lipnevich & Smith, 2009; Nicol & Macfarlane-Dick, 2006; Shunk & Schwartz, 1993; Shute, 2008).

De forma a não limitar a aplicação das estratégias ao período de implementação do programa, os professores frequentaram uma oficina de formação (40 horas), especialmente desenvolvida para abordar todos os conteúdos teóricos e práticos subjacentes ao programa (e.g., motivação e autorregulação da aprendizagem, o modelo SRSD combinado com a estória Sarilhos do Amarelo, feedback).

Para além disso, para reforçar todo o trabalho desenvolvido em sala de aula, os encarregados de educação foram convidados a participar em sessões desenvolvidas pela equipa de investigação deste projeto. Estas sessões tiveram como objetivo promover o papel ativo dos pais na vida escolar dos seus filhos, equipando-os com um conjunto de estratégias a usar no seu dia a dia (e.g., como utilizar o PLEA[2] na preparação da mochila).

Os resultados preliminares deste novo projeto são bastante animadores, indicando uma melhoria significativa na qualidade da escrita de composições. Desta forma, esperamos que os alunos, professores e encarregados de educação, continuem a aplicar as estratégias aprendidas com o

[2] PLEA – acrónimo para "Planificar, Executar e Avaliar" do modelo de Rosário (2004)

programa implementado, tirando o maior benefício da escrita ao longo do seu percurso escolar, que terá muito impacto na vida futura tanto profissional como pessoal (Graham, 2008; Graham, Harris, & Hebert, 2011).

"Vitória, vitória, acabou-se a estória. A lição que ouvi vou tentar aplicar. A lição que aprendi vou tentar recordar. Vitória, vitória, adeus linda estória"

(Capítulo 17, Sarilhos do Amarelo, p. 79)

Chegou o fim deste projeto de doutoramento, mas não o fim da estória. Ao longo dos capítulos da tese aqui apresentados e dos que esperam ser escritos, muitas lições foram aprendidas. Talvez a mais importante, tenha sido conhecer o potencial das estórias na vida dos alunos. A capacidade de transmitir e modelar o conhecimento das diferentes estratégias autorregulatórias foi evidente na facilidade com que os alunos aplicavam as estratégias nas diversas atividades propostas. Ao longo do tempo, foi possível observar a mudança de atitude dos alunos perante a escrita de composições, que se refletia no sorriso demonstrado e empenho crescente no programa.

No entanto, outra lição muito importante, é que qualquer atividade de escrita, por muito simples que seja (e.g., *journals*), desde que implementada com intencionalidade pedagógica, promove a melhoria na qualidade da escrita e atitudes face à mesma. Isto faz com que cada um de nós, sejam pais, professores ou outros agentes educativos, tenha o poder de fazer a diferença no percurso e sucesso escolar das nossas crianças, independentemente dos recursos existentes. Apenas "o tamanho de diferença" (i.e., maior/menor aumento da qualidade da escrita) varia consoante o grau de especificidade da intervenção implementada. Este cenário pode ser altamente motivador e mobilizador da mudança nas nossas escolas, fazendo-nos autores do caminho que queremos percorrer.

"*Vitória, vitória, adeus linda estória"*

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