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Fostering writing in upper primary grades: A study into the distinct and combined impact of explicit instruction and peer assistance

Abstract

As writing is a complex and resource demanding task, high-quality writing instruction is indispensable from primary grades on to support beginning writers in developing effective writing skills. Writing research should therefore provide teachers and schools with evidence-based guidelines for teaching writing in daily practice. In this respect, the present study first investigates the distinct and combined effectiveness of two instructional writing practices (i.e., explicit writing instruction and writing with peer assistance). Second, the present study aims to examine differential effects for students with different background characteristics (i.e., gender and general achievement level). Eleven teachers and their 206 fifth and sixth-grade students participated in the study and were randomly assigned to either one of the four experimental conditions (i.e., EI+IND: explicit instruction + individual writing, EI+PA: explicit instruction + writing with peer assistance, IND: matched individual practice comparison condition, and PA: matched peer-assisted practice comparison condition) or the business as usual condition. Multilevel analyses showed that EI+IND, EI+PA, and PA students outperformed the business as usual students. As to the distinct impact of explicit writing instruction, EI+IND students outperformed IND students at posttest, revealing the effectiveness of explicit writing instruction. As to the effect of peer-assisted writing, there were no significant differences between the individual writing conditions (EI+IND and IND) and the peer-assisted conditions (EI+PA and PA respectively).

Keywords: Writing performance, upper primary grades, explicit writing instruction, peer assistance

Effective writing skills are an important part of everyday communication as these skills enable you to communicate your message with clarity. These skills are essential both in professional and private life. Writing researchers, however, pointed out the complex nature of the writing activity as it is a resource demanding task (Bereiter & Scardamalia, 1987; Flower & Hayes, 1981; Zimmerman & Risemberg, 1997). In this respect, Graham, Gillespie, and McKeown (2013) defined writing as "a goal directed and self-sustained cognitive activity" (p.4), whereby writers have to skilfully manage the writing environment, the restrictions imposed by the writing topic, the

goals and intentions of the writer, and the necessary knowledge, skills, and strategies while writing (Graham et al., 2013). Managing this complex process of writing challenges writers' working memory capacity, especially when low-level transcription skills (e.g., spelling, handwriting) are not fully automatised (Bereiter & Scardamalia, 1987; Bourke & Adams, 2010). Due to these cognitive constraints, most primary students experience difficulties when asked to perform higher-order skills (Cameron & Moshenko, 1996; McCutchen, Covill, Hoyne, & Mildes, 1994; McCutchen, Francis, & Kerr, 1997), such as planning (i.e., producing and organizing ideas), generating texts (i.e., translating ideas into words and sentences), and revising texts (i.e., process of rewriting texts to improve the overall text quality) (Berninger, Fuller, & Whitaker 1996). In this respect, several national assessment reports on writing, for instance in the Netherlands (Inspectie van het Onderwijs, 2010), the USA (National Center for Education Statistics, 2012), and the UK (Ofsted, 2000), revealed alarming results on the writing proficiency in primary school, thereby signalling the rather basic to substandard level of students' writing skills. Taking into account the complexity of writing and students' poor writing skills, high-quality writing instruction is indispensable from primary grades on. In this respect, it is important to support not only struggling writers, but to assist all beginning writers in developing effective writing knowledge, skills, and strategies (Graham, Harris, & Chambers, 2016; Graham, McKeown, Kiuhara, & Harris, 2012; Koster, Tribushinina, de Jong, & van den Bergh, 2015).

In view of providing students with high-quality writing instruction, teachers play a significant role. Graham et al. (2016), however, pointed out that teachers should be supported, as the skilful teaching of writing is difficult and challenging. Therefore, writing research should provide teachers and schools with evidence-based guidelines (Graham et al., 2016). In view of providing these, several meta-analyses identified effective writing interventions in primary schools (Graham et al., 2012; Koster et al., 2015). The present study focusses in particular on explicit writing instruction and peer-assisted writing because of their complementary nature (Ferretti & Lewis, 2013). Whereas explicit writing instruction is necessary for students to acquire writing knowledge and strategies (Graham, 2006), peer-assisted writing can foster the application of the knowledge and strategies taught (Daiute & Dalton, 1993). In what follows, both explicit writing instruction and peer-assisted writing are discussed by reviewing previous research on these evidence-based writing practices.

Explicit writing instruction

Explicitly teaching writing knowledge

In view of effective writing, students need to acquire essential writing knowledge, such as genre knowledge and knowledge about text structure (Graham et al., 2013). Students need to get acquainted, for instance, with the goal and content of a specific genre (e.g., the goal of a descriptive text is to describe something to the readers by providing definitions, facts, examples, …) and with text structures (e.g., a descriptive text consists of a title, introduction, main ideas and additional information, and a conclusion). Previous meta-analyses indeed pointed at the effectiveness of teaching primary school students writing knowledge (Bean & Steenwyk, 1984; Fitzgerald & Teasley, 1986; Graham et al., 2012; Koster et al., 2015). Explicitly teaching writing knowledge, however, requires an important role for the teacher. In this respect, previous research showed that teachers can increase students' writing knowledge by offering them model texts to compare and contrast (Abbuhl, 2011; Charney & Carlson, 1995). Providing students opportunities to study these models is, however, insufficient to improve students' writing. Additionally, teachers have to explicitly explicate and describe the different aspects in the model texts in view of acquiring genre and text structure knowledge (Abbuhl, 2011).

Explicitly teaching writing strategies

Besides writing knowledge, students also have to master effective writing strategies (Graham et al., 2013). This includes, that students first need to learn strategies on how, when, and why to plan texts. Based on their planning, they need to learn to compose texts by generating and transcribing ideas. And finally, they need to get accustomed with revising the content, structure, and surface-level aspects, such as spelling, to improve the overall text quality (Berninger et al., 1996). Previous meta-analyses indeed provided abundant research evidence on the effectiveness of teaching students how to plan, write, and revise texts (Graham et al., 2012; Koster et al., 2015). To teach students these writing strategies, the role of the teacher is key. Based on previous intervention research, different instructional guidelines related to explicit strategy instruction can be distinguished (e.g., Bouwer, Koster, & Van den Bergh, 2017; Fidalgo, Torrance, Rijlaarsdam, Van den Bergh, & Alvarez, 2015; Graham, Harris, & Troia, 2000; Limpo & Alves, 2013). First, teachers can introduce writing strategies by modelling (Fidalgo et al., 2015), implying that they explain, verbalize, and demonstrate their thoughts, actions, and reasons while writing (Schunk, 2003). Second, it is important that teachers explicitly elaborate on how, when, and why to apply the writing strategies. In this respect, they can, for instance, provide students mnemonics to support them in memorizing the different strategy steps (Graham et al.,

2000). Third, teachers should offer ample and various practice opportunities while providing feedback and gradually releasing guidance (Graham et al., 2000). As the ultimate goal of strategy instruction is students' independent strategy use, teachers' guidance should gradually be diminished by encouraging and challenging students to internalize the strategy (Bouwer et al., 2017; Graham et al., 2000). Scaffolding is critical in releasing guidance: teachers have to constantly assess students' strategy use to provide tailored support and feedback (Puntambekar & Hübscher, 2005). In this respect, the teacher role shifts from model to coach (Larkin, 2009).

Peer-assisted writing

To apply and internalize the writing knowledge and strategies taught, it is essential that students can practice their writing in a supportive writing environment (Graham et al., 2016), stimulating students' strategy use by enabling them to actively engage in their learning process (Kistner et al., 2010). To create a supportive writing environment, teachers can, for instance, integrate peer-assisted writing, involving students working together to plan, write, and/or revise their texts (Graham & Perin, 2007). In this respect, reference is made to different applications of peer-assisted writing, such as peer tutoring (e.g., Yarrow & Topping, 2001), peer discussions and peer help (e.g., Harris, Graham, & Mason, 2006), or peer feedback (e.g., Holliway, 2004). Prior research revealed the effectiveness of students collaborating and assisting one another while writing (Harris et al., 2006; Holliway, 2004; Nixon & Topping, 2001; Paquette, 2009; Sutherland & Topping, 1999; Yarrow & Topping, 2001). However, in order to be effective, four important prerequisites of peer assistance should be taken into account: (a) group members have to be engaged with each other, the topic, and the writing process, (b) there needs to be a certain level of cognitive conflict in order to reach a consensus, (c) mutual trust between the group members is needed, and (d) collaboration must be structured so students are able to coordinate their activities while writing together (Dale, 1994).

Student characteristics

Various influencing student characteristics might play a role in the effectiveness of explicit instruction and peer-assisted writing. The present study explicitly takes into account students' gender and general achievement. Previous research, more particularly, revealed gender and achievement-level differences in writing indicating that girls outperform boys (Babayigit, 2015; De Smedt et al., 2017; National Center for Education Statistics, 2012) and that high achievers outperform average and low achievers (De Smedt et al., 2017; Troia, Harbaugh, Shankland, Wolbers,

& Lawrence, 2013). In this respect, it is interesting to investigate whether and how teachers can close this gender and achievement gap by applying specific writing practices, such as explicit writing instruction and peer-assisted writing. As to explicit writing instruction, previous research showed that girls and boys equally benefit from explicit instruction (Bouwer et al., 2017). Regarding students' general achievement, previous studies showed that explicit strategy instruction appears effective for struggling (e.g., Harris et al., 2006) as well as normal writers (e.g., Brunstein & Glaser, 2011) indicating that students of different achievement levels might benefit from explicit writing instruction. To our knowledge, no studies investigated differential effects of peer-assisted writing for boys and girls and for students of different achievement levels.

The present study

Several prominent researchers on explicit strategy instruction (Graham, 2006; Graham et al., 2000) argued to combine this with other instructional writing practices such as peer assistance. As to the *distinct* impact of both practices, the present study builds on former research indicating the effectiveness of explicit writing instruction and peer-assisted writing in primary education (see meta-analyses: Graham et al., 2012; Koster et al., 2015). Research on the *combined* impact of both writing practices in primary grades is, however, rather scarce (e.g., Harris et al., 2006). In this respect, this study goes beyond previous research by (a) investigating both the distinct and the combined impact of explicit writing instruction and writing with peer assistance within the same study, (b) studying the effectiveness of the distinct and combined effect of explicit instruction and peer-assisted writing in comparison to a traditional writing program, (c) examining the differential effects of explicit writing instruction and peer-assisted writing for students with different background characteristics, and (d) applying multilevel modelling to allow for the hierarchical nesting of students within classes. More particularly, the present study focusses on the following research questions:

1. Does the instructional approach (i.e., explicit writing instruction versus matched practice without instruction) influences students' writing performance (RQ1)?
2. Does the mode of delivery (i.e., writing individually versus with peer assistance) influences students' writing performance (RQ2)?

3. Which combination of instructional approach (i.e., explicit writing instruction versus matched practice without instruction) and mode of delivery (i.e., writing individually versus with peer assistance) is most effective as compared to a traditional writing program (RQ3)?
4. To what extent are there differential effects of the instructional approach and/or mode of delivery according to students' gender and general achievement (RQ4)?

To study these research questions, five research conditions were included in the study. Based on two instructional dimensions (i.e., instructional approach and mode of delivery), four experimental conditions were designed (see Table 1). According to the dimension 'explicit instruction', students received explicit writing instruction. The only difference between both explicit instruction conditions was the mode of delivery: students received either individual writing practice (EI+IND) or practice with peer assistance (EI+PA). The opposite conditions, according to the instructional approach, were matched practice comparison conditions without any kind of explicit or implicit writing instruction. The only difference between both matched practice conditions was again the mode of delivery: students practiced either individually (IND) or with peer assistance (PA). In addition to the experimental conditions, a business as usual condition was included in which teachers did not use writing materials offered by the researchers, but applied their traditional writing approach by means of their regular textbooks and manuals to teach language.

Table 1

Overview of the design

		Instructional approach
	Explicit instruction	**Matched practice without explicit or implicit instruction**
Individual	EI+IND	IND
Peer assistance	EI+PA	PA
	Business as usual condition: teachers' traditional writing approach by means of their regular textbooks to teach language	

Concerning the first research question, it can be hypothesised that students receiving explicit writing instruction (EI+IND and EI+PA) will outperform students in the matched practice comparison groups (IND and PA respectively). This hypothesis is based on previous research indicating that explicitly teaching students (a) writing and text structure knowledge by means of comparing and contrasting model texts fosters students' writing (e.g., Bean & Steenwyk, 1984; Charney & Carlson, 1995), and (b) writing strategies (i.e., planning, writing, and revision) by teacher modelling and offering practice opportunities while providing feedback and gradually releasing guidance enhances students' writing performance (Bouwer et al., 2017; Fidalgo et al., 2015; Harris et al., 2006; Limpo & Alves, 2013).

As to the second research question, we hypothesize that students writing with peer assistance (EI+PA and PA) will outperform students writing individually (EI+IND and IND respectively). This hypothesis is based on prior research that revealed the effectiveness of peer-assisted writing whereby students can collaborate and assist one another while writing (e.g., Harris et al., 2006; Nixon & Topping, 2001; Paquette, 2009; Sutherland & Topping, 1999; Yarrow & Topping, 2001).

Concerning the third research question, we predict that explicit writing instruction and peer-assisted writing (EI+PA) will be the most effective instructional combination. This hypothesis is based on the study of Harris et al. (2006) who showed the advantage of adding peer support (i.e., students helping each other to apply taught writing knowledge and strategies) to explicit writing instruction.

Finally, taken previous intervention studies into account, we predict that boys and girls will equally benefit from explicit writing instruction (Bouwer et al., 2017) and that students of different achievement levels will benefit from the explicit writing instruction as well, since explicit strategy instruction appears effective for struggling (e.g., Harris et al., 2006) and normal writers (e.g., Brunstein & Glaser, 2011). Due to a lack of research on differential effects of peer-assisted writing, no specific predictions are made concerning differential effects for boys and girls and students of different achievement levels.

Method

Participants

Teachers participating in the present study were recruited in two ways. First, a call for participation was announced in a popular teacher journal. Second, teachers attending a yearly teacher training day were informed on

the study and those who were interested could sign up for participation. In total, 11 teachers and their 206 fifth and sixth graders from 8 different primary schools in Flanders (Belgium) participated in the study. Regarding the teachers, 4 fifth-grade (2 fifth-grade teachers were co-teaching one class), 5 sixth-grade, and 2 multigrade teachers participated. As in all primary schools in Flanders, the participating teachers were general teachers who teach all subjects (i.e., language, mathematics, …). The majority were female teachers (81.8%). Teachers' average age was 41.97 (*SD* = 9.80) and they had on average 18.36 years (*SD* = 9.33) of teaching experience. Average class size was 18.55 students (*SD* = 4.23) per class, which is representative for the Flemish situation in primary education (De Smedt, Van Keer, & Merchie, 2016).

Regarding the students, 92 fifth (44.7%) and 114 sixth graders (55.3%) participated. Students' average age was 10.95 (*SD* = 0.70), with 57.8% boys and 42.2% girls. The majority of the students were native Dutch speakers (84.5%), 4.8% of the students had a foreign home language (e.g., Arabic, Turkish, or other), and 8.3% of the students were bilingual (Dutch and a foreign language). As teacher judgment is a fairly reliable and efficient assessment technique to assess students' achievement level (Südkamp, Kaiser, & Möller, 2012), all participating teachers were asked to classify their students individually based on their general academic achievement (i.e., students' general performance across subjects), distinguishing (a) below average achievers (i.e., performing below their current grade level), (b) average achievers (i.e., performing at their grade level), and (c) above average achievers (i.e., performing above their current grade level). Table 2 summarises students' characteristics in both the business as usual and experimental conditions.

Table 2

Overview of student characteristics per research condition

	EI+IND		EI+PA		EI		PA		Business as usual	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%
Gender										
Male	30	57.7	18	51.4	21	75	22	52.4	28	57.1
Female	22	42.3	17	48.6	7	25	20	47.6	21	42.9
Total	52	100	35	100	28	100	42	100	49	100
Home language										
Dutch	34	68	30	85.7	25	89.3	40	97.6	45	95.7
Other language	6	12	2	5.7	1	3.6	1	2.4	0	0
Dutch + other language	10	20	3	8.6	2	7.1	0	0	2	4.3
Total	50	100	35	100	28	100	41	100	47	100
Grade										

Fifth grade	32	61.5	0	0	15	53.6	22	52.4	23	46.9
Sixth grade	20	38.5	35	100	13	46.4	20	47.6	26	53.1
Total	52	100	35	100	28	100	42	100	49	100
Achievement level										
Low achiever	18	35.3	9	25.7	6	21.4	9	22	15	31.2
Average achiever	15	29.4	19	54.3	11	39.3	19	46.3	25	52.1
High achiever	18	35.3	7	20	11	39.3	13	31.7	8	16.7
Total	51	100	35	100	28	100	41	100	48	100

Note. EI+IND = Explicit instruction + individual writing; EI+PA = Explicit instruction + writing with peer assistance; IND: Matched individual practice comparison condition; PA: Matched peer-assisted practice comparison condition

Conditions

Four experimental conditions (EI+IND, EI+PA, EI, and PA) and one business as usual condition were included. Ten participating classes with eleven teachers (i.e., two teachers were co-teaching one class) were randomly assigned to one of the five conditions resulting in two classes per condition. To avoid design contamination effects (Rhoads, 2011), teachers from the same school were assigned to the same condition. As to the teachers, chi-square analyses revealed no significant differences in the distribution of gender ($\chi^2 = 6.52$, $df = 4$, $p = .16$) and grade ($\chi^2 = 12.3$, $df = 8$, $p = .14$) between the five research conditions. Furthermore, one-way analysis of variance indicated no significant differences concerning teachers' age ($F(4, 10) = 1.03$, $p = .47$) and experience ($F(4, 10) = 0.28$, $p = .88$). As to the students, chi-square analyses indicated no significant differences in the distribution of gender ($\chi^2 = 4.49$, $df = 4$, $p = .34$) and achievement levels ($\chi^2 = 11.93$, $df = 8$, $p = .16$) between the research conditions. However, significant differences were found as to the distribution of students with a non-native home language ($\chi^2 = 34.40$, $df = 16$, $p < .01$) as the EI+IND condition included more bilingual students and students with a foreign home language (see Table 2).

Procedure

The study took place between September and November 2015. First, pretest data were collected by the main researcher within the classroom context and during regularly scheduled class hours (September 2015). Before the onset of the intervention, all experimental teachers were individually visited to provide them with a researcher-directed and condition-specific 1.5-hour training (September 2015), consisting of (1) a detailed description of the rationale and the aim of the writing intervention, (2) an overview of the instructional materials, the lesson planning, and lesson phases, and (3) a thorough presentation of the instructional approaches. Each teacher was provided with a

detailed teacher manual consisting of a comprehensive description of the background, aims, and organization of the intervention as well as with lesson scenarios in which the objectives, the materials, the content, and the instructional approaches of each lesson were described in detail. Teachers in the explicit instruction conditions (EI+IND and EI+PA) also received supplementary student materials, such as memory cards, strategy cards, planning schemes, and integration cards. All necessary materials were provided, so teachers were not required to develop and implement additional materials. After the teacher training, a 5-week intervention period started in which the teachers were prescribed to teach two lessons of 50 minutes each per week (October-November 2015). During the intervention period, the main researcher and two trainee researchers observed three lessons per teacher (see Fidelity of implementation). After the observed lessons, teachers were provided with an in-service training session in which they were coached in the implementation of the intervention. Finally, posttest data were again collected by the main researcher within the classroom context (November 2015).

Intervention

Based on two instructional dimensions (i.e., instructional approach and mode of delivery), four writing lesson programs were developed (i.e., one for each experimental intervention). Several aspects (e.g., writing topics, writing genre, …) were similar across writing lesson programs to ensure comparability between the experimental conditions, while aspects concerning instructional approach and mode of delivery were clearly distinguished (see Table 3). As to the similarities, each writing lesson program was prescribed in an elaborate teacher manual (i.e., EI+IND: 79 pages, EI+PA: 88 pages, IND: 32 pages, and PA: 39 pages) to support teachers in implementing the intervention. Furthermore, all four experimental conditions included ten writing lessons of 50 minutes each, spread over five consecutive weeks. In Flanders, the writing attainment targets for primary education state that primary school students should be able to write descriptive texts (Flemish Ministry of Education and Training, 2008). Therefore, all lessons focused on writing descriptive texts in which writers had to describe/explain something to an audience. Additionally, students in all four experimental conditions worked on the same writing topics (e.g., describe your holiday, describe a missing person, …) (see Table 4 for an overview of the writing lessons in the experimental conditions). The lessons followed a fixed format: (1) an introduction in which teachers recapitulated the previous lesson and stated the goals of the present lesson, (2) a practice or instruction phase, and (3) a reflection/recapitulation phase in which students were asked to synthesize what they learned or read their texts aloud in front of the class.

Besides these similarities, several aspects concerning the instructional approach and the mode of delivery were clearly distinguished between the experimental conditions (see Table 3).

Table 3

Overview of the procedural features, writing lesson programs, instructional approaches, and modes of delivery for each research condition

	Condition				
	EI+IND	**EI+PA**	**IND**	**PA**	**Business as usual**
Procedural features					
Pretest	✓	✓	✓	✓	✓
Training – support to the teachers	✓	✓	✓	✓	
Posttest	✓	✓	✓	✓	✓
Writing lesson programs					
Lesson programs (cf., teacher manual) and writing materials provided by the researchers	✓	✓	✓	✓	
10 lessons of 50 minutes	✓	✓	✓	✓	
Extra lesson of 25 minutes (cf., rules of peer-assisted writing)		✓		✓	
Writing topics	✓	✓	✓	✓	
Descriptive texts	✓	✓	✓	✓	
Fixed lesson format	✓	✓	✓	✓	
Instructional approaches					
Explicit instruction of writing knowledge	✓	✓			
Explicit strategy instruction (i.e., planning, writing, and revising)	✓	✓			
Providing ample writing opportunities	✓	✓	✓	✓	
Gradually diminishing guidance	✓	✓			
Modes of delivery					
Individual writing	✓		✓		
Peer-assisted writing in fixed heterogeneous dyads		✓		✓	

Table 4

Overview of the writing lessons in the four experimental conditions.

	Writing topic	**Explicit instruction**		**Matched practice without explicit or implicit instruction**	
Lesson		**EI + IND**	**EI + PA**	**IND**	**PA**
1	The perfect age	Explicit instruction of writing knowledge		Practice	
1A			Discussing collaboration rules		Discussing collaboration rules
2	Finally, weekend!	Explicit instruction of the planning strategy		Practice	
3	If I was an animal, I would be…	Explicit instruction of the writing strategy		Practice	
4	Let's travel!	Practice: planning and writing strategy		Practice	
5	Missing!	Explicit instruction of the revising strategy		Practice	
6	Magic potion	Practice: revising strategy		Practice	
7	Party at school!	Guided instruction: planning, writing and revising		Practice	
8	Holiday	Practice: planning, writing, and revising a text		Practice	
9	A special event	Practice: planning, writing, and revising a text		Practice	
10	I wish…	Practice: planning, writing, and revising a text		Practice	

Instructional approach in both explicit writing conditions (EI+IND and EI+PA)

Both EI+IND and EI+PA interventions were characterized by three instructional writing practices: (1) explicit instruction of genre knowledge and text structure knowledge, (2) explicit strategy instruction, and (3) providing ample writing opportunities and gradually diminishing guidance so students can practice and internalize the writing knowledge and strategies taught.

As to the explicit instruction of writing knowledge, students were introduced to the writing genre by studying two varying model texts by means of a 'compare and contrast task'. In this way, students discovered the goal, the content, and the structure of the descriptive text genre. At the end of the first lesson, students received a memory card which summarized the important characteristics of the genre. Appendix 1 presents the memory card which summarizes the genre and text structure knowledge students were taught.

Regarding the explicit instruction of writing strategies, teachers explicitly taught students how to plan (cf., lesson 2), write (cf., lesson 3), and revise (cf., lesson 5) descriptive texts by applying the following instructional procedure: (1) pointing out the importance and value of a specific strategy, (2) discussing students' strategy use, (3) modelling the writing strategy by demonstrating and thinking aloud how, what, and why the teacher applied the writing strategy, so students gain insights into the teacher's thinking and writing process, and (4) introducing different strategy cards summarizing the steps in applying a strategy (i.e., planning, writing, and revision card) and a planning scheme. Appendix 1 presents an overview of the strategy cards which summarize the different steps students were taught to plan, write, and revise texts.

Finally, teachers aimed to increase the internalization of the writing knowledge and strategies by offering ample writing opportunities while gradually diminishing guidance. After the teacher modelled each writing strategy separately (i.e., lesson 2: planning, lesson 3: writing, lesson 5: revising), they offered students opportunities to practice the respective strategies using the different strategy cards (i.e., lesson 4: planning and writing, lesson 6: revising). In lesson 7, teachers guided students throughout the complete writing process by interactively planning, writing, and revising a text while again discussing the different steps and strategies. At the end of the lesson, the teacher introduced an integration card, summarizing all previous cards. In the final three lessons (i.e., lesson 8 to 10) students had to complete three writing assignments (i.e., one writing assignment for each lesson) by strategically planning, writing, and revising texts. During student practice, teachers (1) provided feedback concerning students' text (e.g., goal, content, and structure) and writing process (e.g., the applied planning, writing, and revising

strategies) and (2) differentiated guidance by offering weak writers the help they needed (e.g., separate cards) and challenging stronger writers to gradually diminish the use of the supporting materials (e.g., integration card or writing without supportive materials).

Instructional approach in both matched practice comparison conditions (IND and PA)

Both IND and PA experimental interventions were characterized by the instructional writing practice in which teachers provide ample writing opportunities to practice writing. Each lesson, students were offered a challenging and communicative writing task, parallel to the writing topics in the EI+IND and EI+PA condition resulting in a total of ten writing assignments (see Table 4). During training, teachers were explicitly asked not to instruct writing strategies nor to provide feedback on students' writing process. Teachers were told that the main aim of the intervention was that students practiced their writing. While students were practicing, teachers were asked to provide feedback concerning students' texts (i.e., spelling, structure, and content of the text).

Mode of delivery in both individual writing conditions (EI+IND and IND)

During practice lessons, EI+IND and IND students worked individually, writing texts without peer support. In this respect, students kept individual writing portfolios in which they gathered their completed writing assignments.

Mode of delivery in both peer assistance conditions (EI+PA and PA)

Teachers in the peer assistance conditions were asked to group their students into heterogeneous dyads by taking into account students' writing performance level (i.e., pairing poor and good writers) on the one hand and their personalities (i.e., matching students' temperament) on the other hand. More specifically, teachers were asked to list all their students starting with the 'strongest' and ending with the 'weakest writer'. Then, they split the ranking in half, so they were able to pair the strongest writer in the first half to the strongest writer in the second half and so on until all students had a writing partner. The teachers adjusted this pairing procedure when a group consisted of students' with clashing temperaments endangering optimal collaboration. If the number of students in the class was uneven, the teacher exceptionally put together three students in one group. The heterogeneous dyads were fixed for the duration of the intervention so they could get used to each other's abilities and limitations. To let students get acquainted with their writing partner, teachers implemented an additional lesson of 25 min in which rules on peer-

assisted writing were discussed and agreed upon (cf., lesson 1A, see Table 4). Students had to sign the rules to show their engagement to collaborate with their writing partner. During the practice lessons, EI+PA and PA students wrote together with their fixed writing partner, always resulting in a shared writing document (e.g., shared planning or shared text). In this respect, the writing partners kept a shared writing portfolio in which they gathered their writing assignments.

Fidelity of implementation

In line with previous research (Bouwer et al., 2017), three methods were applied to ensure fidelity of implementation (Dumas, Lynch, Laughlin, Smith, & Prinz, 2001; O'Donnell, 2008): (1) researchers checked the individual writing portfolios in which the students kept their texts, (2) experimental teachers completed logbooks, and (3) three researchers conducted observations in all experimental classes to ensure intervention fidelity. Finally, researchers also conducted observations in the business as usual condition to analyse the instructional writing practices and mode of delivery and to determine whether there was any contamination of instruction in the business as usual classes.

Students' writing portfolios

To assess the number of completed lessons, we verified the number of texts in students' writing portfolios. On average, 90.96% of the experimental students completed the ten writing lessons.

Teacher logbooks

Throughout the complete intervention, experimental teachers were asked to complete logbooks with structured protocols for each lesson (based on Merchie & Van Keer, 2016), providing information on the date, hour, and total time spent on each lesson. The protocols showed that teachers reported that they spent on average 55 minutes on each lesson (SD = 6.70). In this respect, some teachers exceeded the prescribed time of 50 minutes per lesson. There were no significant differences between conditions ($F(3, 7) = 3.08$, $p = .15$).

Observations

Three trained researchers conducted preannounced observations during three lessons of each experimental teacher (i.e., 24 observations in total). As only one researcher observed each class, we were unable to compute an

inter-observer agreement. The EI+IND and EI+PA teachers were observed during two lessons in which they taught a strategy (e.g., planning, writing, or revising) and one student practice lesson. The IND and PA teachers were observed during three practice lessons. Table 5 shows teachers spent on average 49.40 minutes (*SD* = 13.82) on the observed lessons, which closely approximates the time teachers reported in the logbooks (i.e., 55 minutes) and prescribed time in the teacher manual (i.e., 50 minutes). Based on the observation instrument of Bouwer et al. (2017), the researchers measured teachers' time on task (i.e., plenary instruction, classroom interaction, and monitoring students' progress and providing feedback) and time off task. Second, they assessed the global quality of the observed lesson on a 5-point scale, ranging from 'very low quality' to 'very high quality': (1) the quality of instruction, (2) class management, and (3) student engagement (based on Vaughn et al., 2011). Finally, they checked the quality of implementation of the intervention. In this respect, the observers more particularly assessed the quality of implementation concerning: (1) the introduction, practice, and reflection phase in all experimental conditions, (2) the explicit strategy instruction in the explicit instruction conditions, and (3) the mode of delivery in all experimental conditions. To assess the quality of implementation, a 5-point scale ranging from 'not observed' to 'observed with high alignment with the teacher manual' was opted for instead of assessing whether a specific element was or was not observed. In this way, more detailed information on the quality of implementation was obtained instead of merely checking whether or how often a critical element was included during the observed lesson (based on Vaughn et al., 2011).

The observational results showed that experimental teachers were on task on average 88.56% of the total lesson time (see Table 5). About half of the time (on average 51.56%), teachers in all conditions were monitoring students' progress, while students were writing/practicing. As expected, teachers in the explicit instruction conditions devoted proportionally more time on plenary instruction than teachers in the conditions without explicit instruction. Furthermore, the observational results indicate that the global quality of the observed lessons was high in all experimental conditions (see Table 5). More specifically, the quality of instruction was high (M = 4.53, SD = 0.58), teachers were able to manage their class (M = 4.25, SD = 1.04), and students were engaged (M = 4.57, SD = 0.70) and this without significant differences between conditions ($F(3, 24) = 0.94$, $p = .44$; $F(3, 24) = 0.30$, $p = .83$; and $F(3, 24) = 0.20$, $p = .90$, respectively). Finally, the observational data showed that the experimental teachers followed the instructions in the teacher manual carefully, as most of the critical elements of the intervention were observed with high alignment with the teacher manual (see Table 6). More particularly, almost all experimental teachers

followed the teacher manual by starting the observed lessons with an introduction (*M* = 4.58, *SD* = 0.73) followed by a practice phase (*M* = 4.60, *SD* = 0.60). Surprisingly, however, teachers across all experimental conditions often abruptly finished their writing lesson (*M* = 2.30, *SD* = 1.63), consequently failing to conclude their lessons with a reflection phase as prescribed in the manual. As to the lessons in which the EI+IND and EI+PA teachers explicitly taught a writing strategy, observational data showed that they followed the instructional approach as prescribed in the teacher manual (i.e., pointing out the value of the strategy, discussing students' strategy use, modelling the strategy, introducing the strategy card, and challenging students to internalize the strategy) (see Table 6). Regarding the mode of delivery, EI+IND (*M* = 4.67, *SD* = 0.58) and IND students wrote individually (*M* = 5.00, *SD* = 0.00), while EI+PA (*M* = 4.50, *SD* = 0.71) and PA students (*M* = 4.83, *SD* = 0.71) wrote in heterogeneous dyads (see Table 6).

Table 5

Average time spent on the observed lessons, teachers' time on/off task, and the global quality of the observed writing lessons

	EI+IND	EI+PA	IND	PA	All experimental conditions
Average time spent on observed lesson[a]	55.57 (7.23)	46.67 (11.78)	46.67 (5.61)	48.67 (2.25)	49.40 (13.82)
Teachers' time on/off task					
Time on task	89.23%	94.88%	82.43%	87.70%	88.56%
Plenary instruction	34.99%	26.45%	12.12%	15.60%	22.29%
Classroom interaction	19.07%	28.71%	36.35%	20.26%	26.10%
Monitoring students' progress	45.94%	44.84%	51.30%	64.14%	51.56%
Time off task	10.77%	5.12%	28.82%	12.30%	14.25%
Global quality[b]					
Quality of instruction	4.29 (0.76)	4.50 (0.55)	4.83 (0.41)	4.50 (0.55)	4.53 (0.58)
Class management	4.00 (1.53)	4.50 (0.84)	4.33 (0.52)	4.17 (0.75)	4.25 (1.04)
Student engagement	4.43 (0.79)	4.50 (0.84)	4.67 (0.52)	4.67 (0.52)	4.57 (0.70)

Note. [a] Average time in minutes. Standard deviations are placed between brackets.
[b] Global quality was measured using a 5-point scale ranging from 'very low quality' to 'very high quality'

Table 6

The quality of implementation[a]: Observational data assessing the critical elements of the intervention in the experimental conditions

	M (*SD*)				
	EI+IND	EI+PA	IND	PA	All experimental conditions
Fixed lesson format					
Introduction	4.79 (0.39)	4.91 (0.20)	4.79 (0.29)	3.79 (1.11)	4.58 (0.73)
Practice	4.92 (0.19)	4.42 (0.80)	4.58 (0.66)	4.42 (0.58)	4.60 (0.60)
Reflection	1.57 (1.51)	2.50 (1.76)	2.67 (1.89)	2.58 (1.50)	2.30 (1.63)
Explicit strategy instruction					
Pointing out the value of the strategy	4.75 (0.50)	5.00 (0.00)			
Discussing students' strategy use	4.50 (1.00)	5.00 (0.00)			
Modeling	4.25 (1.19)	3.25 (0.50)			
Introducing strategy cards	4.50 (1.00)	4.46 (0.71)			
Challenging students to internalize writing strategies	5.00 (0.00)	3.25 (2.83)			
Mode of delivery					
Students writing individually	4.67 (0.58)		5.00 (0.00)		
Students writing in heterogeneous dyads		4.50 (0.71)		4.83 (0.71)	

Note. [a] To assess the quality of implementation, the critical elements of the intervention concerning the fixed lesson format, the explicit strategy instruction, and the mode of delivery were measured using a 5-point scale ranging from 'not observed' to 'observed with high alignment with the teacher manual'.

Business as usual condition

Teachers in the business as usual condition were told that the purpose of the study was to investigate primary students' writing progress. Teachers were asked to conduct their writing lessons as they were used to by applying their traditional writing approach by means of regular textbooks and manuals to teach language. In other words, the researchers did not provide any writing materials or guidelines on how to teach writing (e.g., how many writing lessons that should be organized or what instructional writing practices should be implemented). To get more insight into these teachers' writing approach and lessons, the researchers also conducted observations in the business as usual classes. Both teachers organised only one writing lesson during the 5-week intervention period. Although they organised only one lesson, it was a longer writing lesson (i.e., on average 93 minutes, *SD* = 9.90) than the lessons in the experimental conditions. The business as usual teachers were on task on average 89.20% of the total lesson time. They spent about half of their time on monitoring students' progress and giving them feedback while writing (56.45%). Additionally, they devoted a considerable amount of time to plenary instruction (33.27%) and to a lesser extent to classroom interaction (10.28%). Furthermore, observational data showed that the global quality (i.e., on a 5-

point scale) of the observed business as usual lessons was high: the quality of instruction was high (M = 4.00, SD = 0.00), teachers were able to manage their class (M = 3.50, SD = 2.12), and students were engaged (M = 4.00, SD = 1.41).

The content, the instructional approach, and the mode of delivery in the business as usual lessons varied. As to the lesson of the first business as usual teacher, students had to write a story for a writing competition. First, the teacher and students interactively gathered ideas to write about. After that, students had to write their texts individually, while the teacher provided individual feedback. The teacher concluded the lesson with a reflection. Regarding the writing lesson of the other business as usual teacher, students first watched a movie in which a magic trick was explained. Then, the teacher grouped students in pairs and each pair received two descriptive texts in which a magic trick was clarified. Based on these texts, they tried to perform the magic trick. Afterwards, students had to sum up which aspects should be described when you want to explain a magic trick. In the final phase of the lesson, students had to individually write a descriptive text in which they explained their own magic trick. During this practice phase, the teacher provided individual feedback.

Social validity

Teachers' logbooks also provided information on the social validity of the study (Fawcett, 1991). In this way, we gathered insight into teachers' satisfaction with and acceptance of the intervention. More particularly, teachers evaluated their attainment regarding each lesson objective on a 5-point scale, ranging from 'not attained' to 'fully attained'. In addition, they evaluated the instructional materials on a five-point scale, ranging from 'very unclear' to 'very clear'. All experimental teachers reported high levels of attaining the lesson objectives (M = 4.09, SD = 0.59) ($F(3, 7) = 1.77$, $p = .29$) and they indicated that the instructional materials were very clear (M = 4.46, SD = 0.49). However, there was a significant difference between the conditions, revealing that EI+IND teachers were less positive about the materials ($F(3, 7) = 10.65$, $p < .05$). Furthermore, teachers were asked to evaluate each lesson on a ten-point scale regarding the degree to which: (1) they valued the lesson (i.e., ranging from 'very invaluable to stimulate students' writing' to 'very valuable to stimulate students' writing'), (2) they experienced difficulties in implementing the lesson (i.e., ranging from 'too difficult to implement in the class' to 'very easy to implement in the class'), and (3) students experienced difficulties during the lesson (i.e., ranging from 'students experienced a lot of difficulties' to 'students experienced no difficulties'). The protocols indicated that teachers valued the lessons (M =

8.05, *SD* = 0.58), which they also rated as quite easy to implement (*M* = 7.64, *SD* = 0.81) without significant differences between conditions ($F(3, 7) = 1.43$, $p = .36$ and $F(3, 7) = 1.10$, $p = .45$ respectively). Teachers across all experimental conditions also reported that the writing lessons were not too difficult, nor too easy for the students (*M* = 7.08, *SD* = 1.16) ($F(3, 7) = 1.02$, $p = .62$).

Measures

Writing performance

To assess students' writing performance both at pretest and posttest, a writing test which was developed and tested in a prior large-scale study (De Smedt et al., 2016) was administered. More particularly, students were asked to write a descriptive text based on a visual prompt: an alien standing before a large building ignorant what the building is and what is happening there. Based on this prompt, students were asked to describe respectively a school (i.e., pretest) and a supermarket (i.e., posttest) to the visiting alien. To assess text quality, a stepwise procedure was applied (De Smedt et al., 2016). First, students' handwritten texts were typed and corrected (i.e., spelling, punctuation, and capitalization errors) to reduce presentation effects (Graham, Harris, & Hebert, 2011). Second, following the benchmark rating procedure (Bouwer et al., 2017; De Smedt et al., 2016; Tillema, Van den Bergh, Rijlaarsdam, & Sanders, 2012), two experts randomly selected 70 pretests and ranked these texts ranging from the text with the lowest quality to the text with the highest quality (i.e., the writer describes the building in detail, text and sentences are well structured, word choice is varied, …). Based on this ranking, five target texts were selected (i.e., 1st, 25th, 50th, 75th, and 100th percentile) and were put forward as benchmarks representing the baseline range in text quality from low, medium, and high levels (Schoonen, 2005; Tillema et al., 2012). The benchmark score for the average text quality was 100, with an interval of 15 between target texts. Finally, all texts were randomly assigned to two independent trained raters who assessed the text quality using the continuous scale of benchmark texts. In total, 22% of the texts were double-scored resulting in an acceptable interrater reliability (Pearson $r = .76$, $p < .01$ and Krippendorff's $\alpha = .63$).

Student characteristics

We registered information on students' gender (0 = boy, 1 = girl) by means of a student questionnaire. As teacher judgment is a fairly reliable and efficient assessment technique to assess students' general achievement level

(Südkamp et al., 2012), all participating teachers were asked to classify their students individually based on their general academic achievement (i.e., students' general performance across subjects), distinguishing (a) below average achievers (i.e., performing below their current grade level), (b) average achievers (i.e., performing at their grade level), and (c) above average achievers (i.e., performing above their current grade level). Based on previous research on achievement-level differences in writing, this indication was used as a categorical variable for grouping low, average, and high achievers (De Smedt et al., 2017).

Data analysis

The data under investigation have a clear hierarchical two-level structure, with students (level 1) nested within classes (level 2) (Hox, 2002). Multilevel analyses were conducted using MLwiN 2.29 (Rasbash, Charlton, Browne, Healy, & Cameron, 2009). Four main steps were taken into the analyses. First, the fully unconditional two-level null model was computed (i.e., students at level 1 and classes at level 2). Second, students' writing pretest score was included as a covariate to control for baseline performance (Model 1). Third, the experimental conditions were included into the model (Model 2) to investigate differential posttest scores comparing: (1) the explicit writing conditions (EI+IND and EI+PA) to the matched practice conditions (IND and PA) (RQ1), (2) the individual writing conditions (EI+IND and IND) to the peer-assisted conditions (IND+PA and PA) (RQ2), and (3) the experimental conditions (EI+IND, EI+PA, IND, and PA) to the business as usual condition (RQ3). To obtain a better understanding of the relative impact of the significant parameters, standardised regression coefficients (*SD*) were calculated (Cohen, 1977). As these can be interpreted as effect sizes, we followed Cohen's benchmarks for interpretation (i.e., small effect size: $SD = 0.2$, medium effect size: $SD = 0.5$, and large effect size: $SD = 0.8$) (Cohen, 1977). Finally, individual learner characteristics (i.e., gender and general achievement level) were added as explanatory variables in the fixed part of the model and interaction effects with the conditions were included (RQ4) (Model 3).

Results

Multilevel results

The random part of the two-level null model showed that the variances at class level were significantly different from zero ($\chi^2 = 4.57$, df = 1, $p < .05$), justifying the application of multilevel modeling (see Table 7). More

particularly, respectively 53.82% and 46.18% of the overall variability in students' text quality was due to differences between classes and between individual students within classes. The intercept of 97.37 in this null model represents the overall mean posttest score. Adding the pretest scores as covariates (Model 1) revealed that students' pretest scores were positively related to their posttest scores ($\chi^2 = 10.05$, df = 1, $p < .01$).

Table 7

Summary of the model estimates for the two-level analysis of students' writing performance at posttest

	Model 0	Model 1	Model 2[a]	Model 3
Fixed part				
CONS	97.37 (4.00)***	97.48 (3.97)***	80.69 (4.69)***	75.46 (5.24)***
(Pretest score -96.6)		0.14 (0.04)**	0.14 (0.04)**	0.12 (0.04)**
EI+IND			28.69 (6.65)***	31.79 (7.63)***
EI+PA			26.03 (6.72)***	31.69 (7.71)***
IND			9.92 (6.80)	12.13 (7.95)
PA			19.08 (6.65)**	22.41 (7.60)**
Gender (girl)				7.42 (3.16)*
General achievement (low)				-0.88 (3.48)
General achievement (high)				13.55 (4.29)**
Gender (girl).EI+IND				-6.28 (4.38)
Gender (girl).EI+PA				-4.96 (5.04)
Gender (girl).IND				-4.31 (5.64)
Gender (girl).PA				-4.28 (4.55)
General achievement (low).EI+IND				-0.12 (5.10)
General achievement (low).EI+PA				-6.08 (6.12)
General achievement (low).IND				1.76 (6.48)
General achievement (low).PA				-3.51 (5.48)
General achievement (high).EI+IND				-8.41 (5.67)
General achievement (high).EI+PA				-12.47 (6.16)
General achievement (high).IND				-8.66 (6.38)
General achievement (high).PA				-8.85 (5.67)
Random part				
Level: Class				
CONS/CONS	153.07 (71.63)*	150.71 (70.56)*	38.54 (20.26)	43.28 (21.92)*
R^2	53.82%	54.94%	23.78%	29.28%
Level: Student				
CONS/CONS	131.34 (13.58)***	123.59 (12.89)***	123.52 (12.89)***	104.54 (10.93)***
R^2	46.18%	45.06%	76.22%	70.72%
Loglikelihood	1551.41	1516.80	1504.23	1466.79
Reference Model		Model 0	Model 1	Model 2

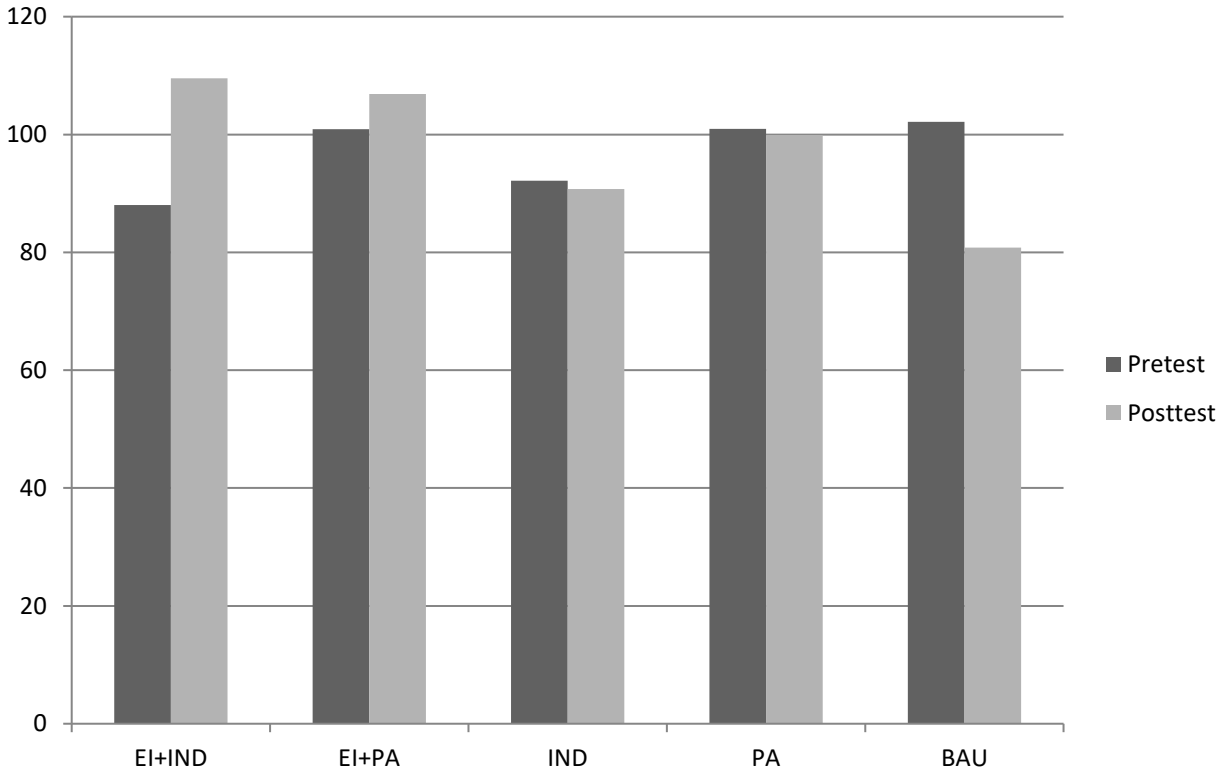
Note. Standard error estimates are placed between brackets. ***p < .001. **p < .01. *p < .05.

[a]Model equation with business as usual condition as reference condition as an example:
$y \sim N(XB, \Omega)$
$y_{ij} = \beta 0_{ij}\,\text{CONS} + \beta 1\,\text{Pretest}(-96.6)_{ij} + \beta 2\,\text{EI+IND}_j + \beta 3\,\text{EI+PA}_j + \beta 4\,\text{IND}_j + \beta 5\,\text{PA}_j$

$\beta 0_{ij} = \beta 0 + u0_j + e0_{ij}$
$[u0_j] \sim N(0, \Omega u)$: $\Omega u = [\sigma^2 u0]$
$[e0_{ij}] \sim N(0, \Omega e)$: $\Omega e = [\sigma^2 e0]$

Effect of instructional approach (RQ1), mode of delivery (RQ2), and combinations (RQ3)

By including the experimental conditions into Model 2 (see Table 7), it was possible to investigate RQ1, RQ2, and RQ3. Concerning RQ1, students in the explicit instruction conditions were compared to students in the matched practice conditions. In this respect, Figure 1 visualises students' pretest scores and posttest scores corrected for baseline performance. Results showed that, when taking into account students' pretest score as covariate, EI+IND students (M = 109.52, SD = 12.7) performed significantly better on the posttest than IND students (M = 90.75, SD = 10.7) (χ^2 = 7.67, df = 1, p <.01) with a large effect size of 1.40 SD. Further, no significant difference between EI+PA and PA students was found (χ^2 = 1.06, df = 1, p =.30).



Pretest	88.01 (17.1)	100.88 (22.1)	92.14 (25.6)	100.97 (22.7)	102.17 (12.3)
Posttest	109.52 (12.7)	106.86 (9.9)	90.75 (10.7)	99.91 (17.2)	80.83 (13.9)

Fig. 1 Students' mean pretest and posttest scores corrected for baseline performance. Standard deviations are placed between brackets.

As to RQ2, students in the individual writing conditions were compared to students in the peer assistance conditions (see Figure 1). Results showed no significant differences between EI+IND (M = 109.52, SD = 12.7) and EI+PA students (M = 106.86, SD = 9.9) (χ^2 = 0.16, df = 1, p =.69), nor between IND (M = 90.75, SD = 10.7) and PA students (M = 99.91, SD = 17.2) (χ^2 = 1.81, df = 1, p =.18) on the posttest scores, after taking into account students' pretest scores.

Regarding RQ3, experimental students were compared to business as usual students (see Figure 1). Results showed that EI+IND (M = 109.52, SD = 12.7), EI+PA (M = 106.86, SD = 9.9), and PA students (M = 99.91, SD = 17.2) outperformed business as usual students (M = 80.83, SD = 13.9) on the posttests (EI+IND: χ^2 = 18.63, df = 1, p <.001, 2.14 SD; EI+PA: χ^2 = 15.00, df = 1, p <.001, 1.94 SD; and PA: χ^2 = 8.23, df = 1, p <.01, 1.43 SD), after taking

into account their prestest scores. No significant differences were found as to IND (M = 90.75, SD = 10.7) and business as usual students' posttest scores (M = 80.83, SD = 13.9) (χ^2 = 2.13, df = 1, p =.14).

Differential effects according to gender and general achievement (RQ4)

As to RQ4, individual learner characteristics (i.e., gender and general achievement level) were added as explanatory variables in the fixed part of the model and interaction effects with the research conditions were included in Model 3 (see Table 7). As to the main effects, results showed that girls (M = 99.85, SD = 16.3) outperformed boys (M = 96.06, SD = 17.4) (χ^2 = 5.50, df = 1, p <.05) and that high achievers (M = 102.48, SD = 14.3) outperformed average achievers (M = 96.54, SD = 17.7) (χ^2 = 9.99, df = 1, p <.01) on the posttests across conditions. As to the interaction effects, no differential effects according to gender nor general achievement were found.

Discussion

This study's primary purpose was to examine the distinct and combined impact of explicit writing instruction and writing with peer assistance. Second, we examined whether the effectiveness of these writing practices are dependent on student characteristics.

Distinct and combined impact of explicit writing instruction and peer-assisted writing

Comparison of the experimental conditions with the business as usual condition revealed that students working with the experimental writing programs focusing on explicit writing instruction (EI+IND and EI+PA) and students writing with peer assistance in the matched practice comparison condition (PA) outperformed the business as usual students. These results confirmed that the experimental writing programs in the EI+IND, EI+PA, and the PA conditions are promising writing programs to foster primary school students' writing performance compared to the writing lessons implemented by the business as usual teachers while applying their traditional writing approach (i.e., by means of their regular manuals and textbooks to teach language). These findings are in line with previous research pointing out the effectiveness of explicit writing instruction and peer-assisted writing (Graham et al., 2012; Koster et al., 2015). Based on the research of Harris et al. (2006), it was anticipated that blending explicit writing instruction and peer-assisted writing (EI+PA) would be the most effective instructional combination. In this respect, however, the effect sizes reported in the present study revealed strong effects of the EI+IND (SD = 2.14), EI+PA (SD = 1.94), and PA writing programs (SD = 1.43) compared to the traditional writing program in the business as usual condition,

without any significant differences between the experimental writing programs. As such, the results of the present study were not in line with the study of Harris et al. (2006) who showed the advantage of adding peer support to explicit writing instruction.

Further, no significant differences were found between students writing individually in the matched practice comparison condition (IND) and students in the business as usual condition. Based on the teacher logbooks in the IND condition and our observations in the business as usual condition, we found that the IND students completed ten writing lessons of on average 55 minutes each, while business as usual conditions received in the same period only one lesson of on average 93 minutes. Although prior research pointed out the effectiveness of additional writing time (Gomez, Parker, Lara-Alecio, & Gomez, 1996), the present study revealed that solely increasing students' writing time appears insufficient to foster their writing.

The present study also revealed more in-depth insight into both writing practices by investigating the distinct impact of explicit writing instruction on the one hand and peer-assisted writing on the other hand. As to the distinct impact of *explicit writing instruction*, comparison of the explicit instruction conditions (EI+IND and EI+PA) with the matched practice conditions (IND and PA) showed that students who were explicitly taught writing knowledge and strategies performed significantly better at posttest. This large effect (i.e., effect size 1.40 *SD*) was, however, only found in the individual and not in the peer-assisted writing condition. The findings in the individual writing conditions corroborate the extensive body of evidence on the effectiveness of explicit writing instruction in primary grades (Graham et al., 2012; Koster et al., 2015). More particularly, these results underline the importance of explicitly teaching students writing knowledge (i.e., goals, content, and structure of a specific genre) (Bean & Steenwyk, 1984; Fitzgerald & Teasley, 1986) and strategies (i.e., planning, writing, and revising) to foster students' writing (Bouwer et al., 2017; Fidalgo et al., 2015; Limpo & Alves, 2013).

The success of the individual writing program on explicit instruction might be explained by several instructional approaches enclosed in the program. Although we did not investigate these components separately in the present study, insights based on previous research enable us to presume possible explanations concerning the overall effectiveness of the program. First, students were offered 'compare and contrast tasks' to discover important genre characteristics concerning the goal, the text structure, and the content of descriptive texts, since it is known that providing students with opportunities to study model texts is essential to acquire necessary writing knowledge (Abbuhl, 2011; Charney & Carlson, 1995). Second, teachers explicitly taught students how to plan, write, and revise

descriptive texts by pointing out the importance and value of a specific strategy, discussing students' strategy use, modelling the writing strategy by demonstrating and thinking aloud, and elaborating on the steps in applying strategies. In this respect, the present approach incorporated modelling writing strategies (Fidalgo et al., 2015) and supporting students in applying and memorizing strategies by means of strategy cards (Graham et al., 2000) as evidence-based effective approaches. Third, teachers aimed at establishing students' independent strategy use as well, by providing feedback and gradually diminishing guidance during individual writing practice, since prior research provided evidence on the shifting teacher role from model to coach (Graham et al., 2000; Larkin, 2009).

As to the distinct impact of *peer-assisted writing*, no significant differences were found comparing the individual writing conditions (EI+IND and IND) with the peer-assisted writing conditions (EI+PA and PA). These findings contrast previous research on the effectiveness of peer-assisted writing in primary education (Graham et al., 2012; Koster et al., 2015). More specifically, previous research showed that various forms of writing with peer assistance are effective, for instance peer tutoring (e.g., Yarrow & Topping, 2001), peer discussions, peer help (e.g., Harris et al., 2006), and providing peer feedback (e.g., Holliway, 2004). A possible explanation for the present findings might be related to the specific operationalization of peer assistance in the present study. In comparison to previous studies in which students' interaction and roles were clearly structured (e.g., Yarrow & Topping, 2001), our operationalization of peer assistance was less structured. More particularly, previous research pointed out four important prerequisites of peer assistance in order to be effective (Dale, 1994). First, group members have to be engaged with each other, the topic, and the writing process. In the present study, this was reflected by asking students to agree on, write down, and sign collaboration rules to show their engagement to write in groups. Second, mutual trust between the group members is needed. To establish this mutual trust, teachers in the present study were asked to create heterogeneous groups but explicitly had to take into account whether students got along. The writing groups were also fixed for the duration of the intervention, so students could get used to and respect each other's abilities and limitations. Third, a certain level of cognitive conflict is required in order to reach a consensus. In this respect, the writing assignments in the present study were challenging, but not too complex so students were able to reach consensus. Finally, collaboration must be structured so students are able to coordinate their activities while writing together. As to this final prerequisite, students in the present study were given the opportunity to spontaneously collaborate with each other without providing them with a set of structures, routines, and understandings to support them in how exactly to approach the collaboration (Schultz, 1997). Future studies should therefore implement a more

structured application of peer assistance in writing and investigate its impact on students' writing. To establish a structured application of peer assistance teachers, for instance, can assign different roles (e.g., writer, editor, reviewer, …) to enable group members to explore and experience the writing process from different viewpoints (Lowry, Curtis, & Lowry, 2004) or opt for paired writing (Yarrow & Topping, 2001) in which helper (tutor) and writer (tutee) roles and behaviours are identified during each step of the writing process. In this respect, it will be interesting in future studies to analyse students' interactions while writing collaboratively to gain in-depth insights into how primary students interact and collaborate during writing.

Differential effects according to student characteristics

As anticipated, results revealed no significant differential effects of the conditions for boys and girls or for low, average, and high achievers, indicating that they equally benefitted from the different writing programs. As there is a lack on research investigating differential effects of peer-assisted writing for different types of students, future research should examine more in detail which particular peer-assisted writing practices (e.g., peer tutoring, peer feedback, peer discussions, …) are especially effective for boys and girls and for students with different achievement levels and what the optimal conditions are to implement peer-assisted writing practices in view of fostering all students' writing (e.g., heterogeneous versus homogeneous groups, fixed versus flexible groups, role assignment versus spontaneous collaboration, …).

Limitations and suggestions for future research

Besides the limitations and suggestions already put forward when discussing the results above, we conclude with acknowledging some additional limitations and presenting suggestions for future research. First, we want to point at the rather small sample size with only two classes per condition. Therefore, we suggest to further investigate the effectiveness of explicit writing instruction and a structured application of peer assistance with a larger sample. In addition, the present study examined differential effects of the interventions according to student characteristics. It would be interesting to study differential effects related to other learner characteristics, such as socio-economic status, reading achievement, …, as well. Second, the present study applied a pretest-posttest design. As long-term effects to analyse whether the effects of the writing practices were maintained over time were not investigated, future studies should include a retention test. For instance, Bouwer et al., (2017) highlighted the added value of a switching

replication design, including two groups and three measurement occasions (i.e., pretest, posttest, and retention test). Applying such a design can be interesting, for instance, to investigate whether peer assistance fosters maintenance in explicit writing programs. Third, as the instructional writing program in the four experimental conditions focused on only one text genre (i.e., descriptive texts), the present results cannot as a matter of course be transferred to other genres. In this respect, it will be interesting to investigate generalization effects as well to examine whether students are able to generalise the taught strategies to other genres. Further, it will also be worthwhile to investigate whether peer assistance embedded in explicit writing programs can foster generalization of the learned strategies to other text genres. Fourth, at each measurement occasion students' writing performance was measured by only one task in one genre. Based on recent research on the generalizability of writing scores, Bouwer et al. (2015) highlighted the need for different tasks within one genre (or preferably, different tasks within different genres) to measure writing performance. Fifth, students' general academic achievement was assessed by teacher judgement. Although previous research showed that teacher judgement is a fairly reliable assessment technique (Südkamp et al., 2012), future research should include a more objective measure to assess students' academic achievement. Finally, as to the measures regarding treatment fidelity, the lessons of the teachers were observed by only one researcher. To obtain reliable observational data, future studies should therefore focus on observing multiple lessons by two or more observers. In this way, inter-observer agreement can be calculated.

Educational implications

As the skilful teaching of writing is difficult and challenging, teachers should be supported. Therefore, writing research should provide teachers and schools with evidence-based guidelines (Graham et al., 2016). Based on the present findings, several educational implications can be formulated. First, it appears important for teachers to review and assess their own writing practices in terms of the quality of their instruction and not solely in terms of the quantity of writing instruction. In this respect, teachers should be aware of the fact that students do not learn to write automatically; they need explicit instruction and guidance. The present study more specifically showed the effectiveness of explicitly teaching students writing knowledge (by means of compare-and-contrast tasks) and strategies (by means of explicit strategy instruction). Further, it appears essential to create supportive writing environments in which students can apply what they have learned. Such an environment in which students practice individually or collaboratively enables them to actively engage in their writing process.

Appendices

Appendix 1

Overview of the memory and strategy cards explaining the writing knowledge and writing strategies taught

Memory card (= writing knowledge)

1. **Goal!:** When you want to explain something to someone, you provide information on a certain topic so the reader is able to understand the information related to the topic
2. **How?**
   - ✓ **Content**: You provide facts, examples, and details about the topic so the reader understands the topic
   - ✓ **Structure**: your texts consists of 4 large parts
     1) **Title**
     2) **Introduction**: provides information so the reader knows the topic of the text
     3) **Middle**: describes all important information related to the topic by means of examples, details, …
     4) **Conclusion**: summarizes the text or provides a conclusion

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Planning strategy card

1. **Read the assignment carefully**
   - ✓ What should I write about? Write the writing topic in the planning scheme.
   - ✓ What does the assignment tell me? Write down in the planning scheme what you need to do according to the assignment
2. **Collect main ideas**
   - ✓ What do I know about the topic and what do I want to write about the topic? These are your main ideas. Write your main ideas in the planning scheme
3. **Add additional information**
   - ✓ What do I know about the main ideas? This additional information could be details or examples. Write the additional information in the planning scheme.
4. **Organise your main ideas**
   - ✓ What is the order of my main ideas? Number each main idea in the planning scheme

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Writing strategy card

1. **Use the planning scheme to write down your text**. The planning scheme helps you with: the structure and the content of your text!
2. **Construct your text as follows**:
   - **a. Title**

b. Introduction

Paragraph 1	Write down the writing topic
	Write down what you are going to tell about the topic. Summarize your main ideas

c. Middle

Paragraph 2	Write down you first main idea and additional information
Paragraph 3	Write down you second main idea and additional information
Paragraph 4	Write down you third main idea and additional information
Paragraph …	…

d. Conclusion

Final paragraph	Summarize your text or provide a conclusion

Keep in mind:

- ✓ Correct spelling and sentence construction
- ✓ Varied word choice

Revision strategy card

1. **Reread your text and check the following**:
   - ✓ <u>The goal</u>
     - Do you provide information on the writing topic?
     - Are you sure you are not telling a story?
   - ✓ <u>The content</u>
     - Do you provide facts, examples, and details about the topic?
     - Will the reader understand the topic based on the information?
   - ✓ <u>The structure</u>
     - Does your text consist of: a title, an introduction, a middle, and a conclusion?
     - Does your text consists of paragraphs?
     - Is each main idea described in a paragraph?
   - ✓ <u>Spelling and sentence construction</u>
2. **Rewrite the highlighted words/sentences: Choose the correct action to rewrite: ADC**
   - ✓ <u>A</u>DD:
     - More information, details, examples, …
     - Correct punctuation and capitalization
     - Paragraph(s)
   - ✓ <u>D</u>ELETE

- Word(s)
- (Part of) sentence(s)
- Paragraph(s)

✓ CHANGE

- Spelling errors
- Words using other words
- Sentences by rewriting them (other words, other structure)
- Structure of the text

3. Rewrite the text so you can hand in the final text version

References

Abbuhl, R. (2011). Using models in writing instruction: A comparison with native and nonnative speakers of English. *SAGE Open, 1*(3), 1-12. doi:10.1177/2158244011426295

Babayigit, S. (2015). The dimensions of written expression: Language group and gender differences. *Learning and Instruction, 35*, 33-41. doi:10.1016/j.learninstruc.2014.08.006

Bean, T., & Steenwyk, F. (1984). The effect of three forms of summarization instruction on sixth graders' summary writing and comprehension. *Journal of Reading Behavior, 16*(4), 297-306. doi:10.1080/10862968409547523

Bereiter, C., & Scardamalia, M. (1987). *The psychology of written composition*. Hillsdale, N.J.: L. Erlbaum Associates.

Berninger, V. W., Fuller, F., & Whitaker , D. (1996). A process model of writing development across the life span. *Educational Psychology Review, 8*(3), 193-218. doi:10.1007/BF01464073

Bourke, L., & Adams, A. (2010). Cognitive constraints and the early learning goals in writing. *Journal of Research in Reading, 33*(1), 94-110. doi:10.1111/j.1467-9817.2009.01434.x

Bouwer, R., Béguin, A., Sanders, T., & Van den Bergh, H. (2015). Effect of genre on the generalizability of writing scores. *Language Testing, 32*(1), 83-100. doi:10.1177/0265532214542994

Bouwer, R., Koster, M., & Van den Bergh, H. (2017). Effects of a strategy-focused instructional program on the writing quality of upper elementary students in the Netherlands. *Journal of Educational Psychology. Advance online publication*. doi:10.1037/edu0000206

Brunstein, J., & Glaser, C. (2011). Testing a path-analytic mediation model of how self-regulated writing strategies improve fourth graders' composition skills: A randomized controlled trial. *Journal of Educational Psychology, 103*(4), 922-938. doi:10.1037/a0024622

Cameron, C., & Moshenko, B. (1996). Elicitation of knowledge transformational resports while children write narratives. *Canadian Journal of Behavioural Science, 28*(4), 271-280. doi:10.1037/0008-400X.28.4.271

Charney, D., & Carlson, R. (1995). Learning to write in a genre: What student writers take from model texts. *Research in the Teaching of English, 29*(1), 88-125.

Cohen, J. (1977). *Statistical power analysis for the behavioral sciences*. New York: Academic Press.

Daiute, C., & Dalton, B. (1993). Collaboration between children learning to write. Can novices be masters? *Cognition and Instruction, 10*(4), 281-333. doi:10.1207/s1532690xci1004_1

Dale, H. (1994). Collaborative writing interactions in one ninth-grade classroom. *Journal of Educational Research, 87*(6), 334-344. doi:10.1080/00220671.1994.9941264

De Smedt, F., Merchie, E., Barendse, M., Rosseel, Y., De Naeghel, J., & Van Keer, H. (2017). Cognitive and motivational challenges in writing: Studying the relationship with writing performance across

students' gender and achievement level. *Reading Research Quarterly. Advance online publication*. doi:10.1002/rrq.193
De Smedt, F., Van Keer, H., & Merchie, E. (2016). Student, teacher and class-level correlates of Flemish late elementary school children's writing performance. *Reading and Writing, 29*(5), 833-868. doi:10.1007/s11145-015-9590-z
Dumas, J., Lynch, A., Laughlin, J., Smith, E., & Prinz, R. (2001). Promoting intervention fidelity: Conceptual issues, methods and preliminary results form the EARLY ALLIANCE prevention trial. *American Journal of Preventive Medicine, 20*(1), 38-47. doi:10.1016/S0749-3797(00)00272-5
Fawcett, S. (1991). Social validity: A note on methodology. *Journal of Applied Behavior Analysis, 24*(2), 235-239. doi:10.1901/jaba.1991.24-235
Ferretti, R., & Lewis, W. (2013). Best practices in teaching argumentative writing. In S. Graham, C. A. MacArthur, & J. Fitzgerald (Eds.), *Best practices in writing instruction* (Second Edition ed., pp. 113-140). New York: The Guilford Press.
Fidalgo, R., Torrance, M., Rijlaarsdam, G., Van den Bergh, H., & Alvarez, M. (2015). Strategy-focused writing instruction: just observing and reflecting on a model benefits 6th grade students. *Contemporary Educational Psychology, 41*, 37-50. doi:10.1016/j.cedpsych.2014.11.004
Fitzgerald, J., & Teasley, A. (1986). Effects of instruction in narrative structure on children's writing. *Journal of Educational Psychology, 78*(6), 424-432. doi:10.1037/0022-0663.78.6.424
Flemish Ministry of Education and Training. (2008). *Education in Flanders. The Flemish educational landscape in a nutshell.* Retrieved from http://www.scholenbanden.be/files/onderwijsinvlaanderennotendopen.pdf.
Flower, L., & Hayes, J. (1981). A cognitive process theory of writing. *College Composition and Communication, 32*(4), 365-387. doi:10.2307/356600
Gomez, R., Parker, R., Lara-Alecio, R., & Gomez, L. (1996). Process versus product writing with limited English proficient students. *Bilingual Research Journal, 20*(2), 209-233. doi:10.1080/15235882.1996.10668645
Graham, S. (2006). Strategy instruction and the teaching of writing. In C. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (pp. 187-207). New York: The Guilford Press.
Graham, S., Gillespie, A., & McKeown, D. (2013). Writing: importance, development, and instruction. *Reading and Writing, 26*(1), 1-15. doi:10.1007/s11145-012-9395-2
Graham, S., Harris, K., & Chambers, A. (2016). Evidence-based practice and writing instruction: A review of reviews. In C. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of Writing Research* (pp. 211-226). New York: The Guilford Press.
Graham, S., Harris, K., & Hebert, M. (2011). It is more than just the message: Analysis of presentation effects in scoring writing. *Focus on Exceptional Children, 44*(4), 1-12.
Graham, S., Harris, K., & Troia, G. (2000). Self-regulated strategy development revisited: Teaching writing strategies to struggling writers. *Topics in Language Disorders, 20*(4), 1-14.
Graham, S., McKeown, D., Kiuhara, S., & Harris, K. (2012). A meta-analysis of writing instruction for students in the elementary grades. *Journal of Educational Psychology, 104*(3), 879-896. doi:10.1037/A0029185
Graham, S., & Perin, D. (2007). A meta-analysis of writing instruction for adolescent students. *Journal of Educational Psychology, 99*(3), 445-476. doi:10.1037/0022-0663.99.3.445
Harris, K., Graham, S., & Mason, L. (2006). Improving the writing, knowledge, and motivation of struggling young writers: Effects of self-regulated strategy development with and without peer support. *American Educational Research Journal, 43*(2), 295-340. doi:10.3102/00028312043002295
Holliway, D. (2004). Through the eyes of my reader: A strategy for improving audience perspective in children's descriptive writing. *Journal of Research in Childhood Education, 18*(4), 334-349. doi:10.1080/02568540409595045
Hox, J. (2002). *Multilevel analysis: Techniques and applications*. London: Psychology Press.

Inspectie van het Onderwijs. (2010). *Het onderwijs in het schrijven van teksten. De kwaliteit van het schrijfonderwijs in het basisonderwijs.* Utrecht: Ministerie van Onderwijs, Cultuur en Wetenschap.

Kistner, S., Rakoczy, K., Otto, B., Dignath-van Ewijk, C., Buttner, G., & Klieme, E. (2010). Promotion of self-regulated learning in classrooms: investigating frequency, quality, and consequences for student performance. *Metacognition and Learning, 5*(2), 157-171. doi:10.1007/s11409-010-9055-3

Koster, M., Tribushinina, E., de Jong, P., & van den Bergh, H. (2015). Teaching children to write: A meta-analysis of writing intervention research. *Journal of Writing Research, 7*(2), 299-324. doi:10.17239/jowr-2015.07.02.2

Larkin, S. (2009). *Metacognition in young children*. London: Routledge.

Limpo, T., & Alves, R. (2013). Teaching planning or sentence-combining strategies: Effective SRSD interventions at different levels of written composition. *Contemporary Educational Psychology, 38*(4), 328-341. doi:10.1016/j.cedpsych.2013.07.004

Lowry, P., Curtis, A., & Lowry, M. (2004). Building a taxonomy and nomenclature of collaborative writing to improve interdisciplinary research and practice. *Journal of Business Communication, 41*(1), 66-99. doi:10.1177/0021943603259363

McCutchen, D., Covill, A., Hoyne, S., & Mildes, K. (1994). Individual differences in writing: Implications of translating fluency. *Journal of Educational Psychology, 86*(2), 256-266. doi:10.1037/0022-0663.86.2.256

McCutchen, D., Francis, M., & Kerr, S. (1997). Revising for meaning, effects of knowledge and strategy. *Journal of Educational Psychology, 89*(4), 667-676. doi:0.1037/0022-0663.89.4.667

Merchie, E., & Van Keer, H. (2016). Stimulating graphical summarization in late elementary education: The relationship between two instructional mind map approaches and student characteristics. *Elementary School Journal, 116*(3), 487-522. doi:10.1086/684939

National Center for Education Statistics. (2012). *The nation's report card: Writing 2011*. Washington, D.C.: Institute of Education Sciences, U.S. Department of Education.

Nixon, J., & Topping, K. (2001). Emergent writing: the impact of structured peer interaction. *Educational Psychology, 21*(1), 41-58. doi:10.1080/01443410020019821

O'Donnell. (2008). Defining, conceptualizing, and measuring fidelity of implementation and its relationship to outcomes in K-12 curriculum intervention research. *Review of Educational Research, 78*(1), 33-48. doi:10.3102/0034654307313793

Ofsted. (2000). *Teaching of writing in primary schools: could do better*. Manchester: Ofsted.

Paquette, K. (2009). Integrating the 6+1 writing traits model with cross-age tutoring: An investigation of elementary students' writing development. *Literacy Research and Instruction, 48*(1), 28-38. doi:10.1080/19388070802226261

Puntambekar, S., & Hübscher, R. (2005). Tools for scaffolding students in a complex learning environment: What have we gained and what have we missed? *Educational Pyschologist, 40*(1), 1-12. doi:10.1207/s15326985ep4001_1

Rasbash, J., Charlton, C., Browne, W., Healy, M., & Cameron, B. (2009). MLwiN Version 2.1. Centre for Multilevel Modelling: University of Bristol.

Rhoads, C. (2011). The implications of "contamination" for experimental design in education. *Journal of Educational and Behavioral Studies, 36*(1), 76-104. doi:10.3102/1076998610379133

Schoonen, R. (2005). Generalizability of writing scores: An application of structural equation modeling. *Language Testing, 22*(1), 1-30. doi:10.1191/0265532205lt295oa

Schultz, K. (1997). 'Do you want to be in my story?': Collaborative writing in an urban elementary classroom. *Journal of Literacy Research, 29*(2), 253-287. doi:10.1080/10862969709547958

Schunk, D. (2003). Self-efficacy for reading and writing: Influence of modeling, goal setting, and self-evaluation. *Reading and Writing Quarterly, 19*(159-172). doi:10.1080/10573560308219

Südkamp, A., Kaiser, J., & Möller, J. (2012). Accuracy of teachers' judgements of students' academic achievement: A meta-analysis. *Journal of Educational Psychology, 104*(3), 743-762. doi:10.1037/a0027627

Sutherland, J., & Topping, K. (1999). Collaborative creative writing in eight-year-olds: comparing cross-ability fixed role and same-ability reciprocal role pairing. *Journal of Research in Reading, 22*(2), 154-179. doi:10.1111/1467-9817.00080

Tillema, M., Van den Bergh, H., Rijlaarsdam, G., & Sanders, T. (2012). Quantifying the quality difference between L1 and L2 essays: A rating procedure with bilingual raters and L1 and L2 benchmark essays. *Language Testing, 30*(1), 71-97. doi:10.1177/0265532212442647

Troia, G., Harbaugh, A., Shankland, R., Wolbers, K., & Lawrence, A. (2013). Relationships between writing motivation, writing activity, and writing performance: Effects of grade, sex, and ability. *Reading and Writing, 26*(1), 17-44. doi:10.1007/s11145-012-9379-2

Vaughn, S., Klingner, J., Swanson, E., Boardman, A., Roberts, R., Mohammed, S., & Stillman-Spisak, S. (2011). Efficacy of collaborative strategic reading with middel school students. *American Educational Research Journal, 48*(4), 938-964. doi:10.3102/0002831211410305

Yarrow, F., & Topping, K. (2001). Collaborative writing: The effects of metacognitive prompting and structured peer interaction. *British Journal of Educational Psychology, 71*, 261-282. doi:10.1348/000709901158514

Zimmerman, B., & Risemberg, R. (1997). Becoming a self-regulated writers: A social cognitive perspective. *Contemporary Educational Psychology, 22*, 73-101. doi:10.1006/ceps.1997.0919