Effects of teacher-implemented explicit writing instruction on the writing self-efficacy and writing performance of 5th grade students

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Abstract: Meta-analyses indicate that explicit writing instruction (EWI) is an effective method for improving student writing self-efficacy and writing performance. EWI relies on explicit instruction of writing strategies through modeling, scaffolding and self-regulation. Most EWI-based interventions have been conducted by researchers, generally with subgroups of students or on a one-on-one basis, and very few have been conducted in other languages than English. Our quasi-experimental study aims to address these limits by testing EWI's effects when teachers themselves intervene using peer feedback during the writing of opinion letters. We used practice-based professional development to teach teachers how to use EWI, and compared two experimental conditions (EWI with and without peer feedback) to a control group (Business as Usual). A total of 483 French-speaking 5th grade students participated in the study. Results from repeated measure analyses showed that, with or without peer feedback, the EWI intervention produced better writing performance and higher self-efficacy compared to the control group. We discuss the role of EWI for writing performance and self-efficacy.

Keywords: Explicit writing instruction, writing performance, self-efficacy, argumentative writing, practice-based professional development

Falardeau, E., Guay, F., Dubois, P., & Pelletier, D. (2024). Effects of teacher-implemented explicit writing instruction on the writing self-efficacy and writing performance of 5th grade students. *Journal of Writing Research, 16*(1), 1-38. DOI: https://doi.org/10.17239/jowr-2024.16.01.01

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In the United States, 75% of 8th and 12th graders do not meet, or only partially meet, national standards in writing (National Center for Education Statistics, 2012). In the Canadian province of Quebec, French-speaking students likewise experience writing difficulties that become more pronounced as they progress through grade levels. Between 55% and 65% of secondary school students struggle with the provincial writing exam administered in 8th grade, which focuses on primary school curriculum content (1st to 6th grades; Ministère de l'Éducation, du Loisir et du Sport, 2013).

Struggling writers see writing solely as a way of producing content. They plan their text as their ideas arise and make only surface revisions (e.g., grammar and spelling). They also spend less time planning, writing and revising their texts than proficient writers. Struggling writers perceive writing as a linear process, limited to producing a text based on their knowledge of the topic (Gillespie & Graham, 2014). Explicit writing instruction (EWI) has been shown to be an effective way to improve students' writing skills. This method relies on making writing strategies visible or explicit to struggling students, generally through modeling, scaffolding and self-regulation of learning strategies. Below, we provide details on EWI, an approach that mobilizes students' self-regulation and self-efficacy.

1. The Writing Process and the Role of Self-Regulation in Learning to Write

Writing is a difficult task as writers must constantly keep their audience in mind without interacting directly with readers (Graham & Harris, 2018). Some types of text accentuate this difficulty. One such is the argumentative text, the focus of this study. Writers are unable to fully anticipate how readers will react to their arguments. By constructing counterarguments, however, the writer must enter in a dialogue with readers, anticipating their responses and objections (Prata et al., 2019).

Learning to write also involves self-regulation, by which writers can control their writing activity. Self-regulation is a cognitive or metacognitive process that aims to ensure the control and adjustment of cognitive, affective, and social activities contributing to the transformation of the learners' knowledge and skills into a coherent text (Mottier-Lopez, 2012). Self-regulation involves identifying goals and steps for achieving them and selecting strategies for success (Hattie and Timperley, 2007). From a Vygotskian perspective, it is a process of internalizing skills and knowledge through interactions with others (Cartier & Mottier-Lopez, 2017).

2. The Role of Self-Efficacy in Writing Development

Self-efficacy plays a key role in students' writing self-regulation (MacArthur & Graham, 2016; Zimmerman & Risemberg, 1997; De Smedt et al., 2020). Self-efficacy refers to an individual's beliefs about their abilities to achieve goals (Bandura, 1977). Students with high writing self-efficacy feel in control during the writing process.

They believe in their abilities to produce a text that meets grade-level expectations (MacArthur & Graham, 2016) and are more successful in writing (Pajares, 2003). In contrast, students who accumulate failures in writing and who master few learning strategies do not feel confident in their ability to produce texts that meet expectations (Bruning & Kauffman, 2016). The link between self-efficacy and students' writing performance is worth studying.

3. Explicit Instruction to Enhance Writing Self-Efficacy

Because self-efficacy is important for developing writing skills (Graham et al., 2017), it is valuable to uncover strategies for fostering students' perceptions of self-efficacy. Recent meta-analyses suggest that explicit writing instruction (EWI) is one of the instructional methods with the strongest effect sizes on self-efficacy, regardless of students' competence, gender or school level (Rogers & Graham, 2008; Harris et al., 2012; Graham et al., 2013, 2016; Gillespie & Graham, 2014; Graham & Harris, 2017; De Smedt & Van Keer, 2018b). EWI teaches writing strategies for planning (generating and selecting ideas, creating a plan), drafting (choosing vocabulary, constructing sentences), revising (ensuring the progression of ideas, checking the accuracy of vocabulary and spelling) and correcting. Efficient EWI models include five practices: 1) showing how the strategies work, 2) modeling, 3) guiding students' practices by focusing on scaffolding and promoting student collaboration for better verbalization of strategies, 4) fostering independent practice and 5) transferring the strategies to writing tasks.

There are different models of EWI. One of the most efficient is Self-Regulated Strategy Development (SRSD), which prioritizes activation of background knowledge, discussion, modelling, memorization, support and independent practicing of the writing strategies presented above and incorporates four self-regulatory strategies (i.e., goal setting, self-monitoring, self-talk and self-reinforcement; Graham & Harris, 2005) into EWI. Another important EWI model similar to SRSD is that of De Smedt and Van Keer (2018b), who kept the focus on self-regulatory strategies. However, instead of using SRSD's mnemonic acronyms (such as POW or TREE[i]) for memorization, they use strategy cards that explain to students how to use writing and self-regulatory strategies. Teachers then support students in learning these strategies through guided practice. De Smedt and Van Keer emphasize questioning the students on their use of a strategy in order to develop their self-regulation and adjust teaching as needed.

4. Peer Feedback in Explicit Instruction

Peer feedback appears to enhance the effect of explicit instruction, as explicit instruction coupled with peer support provides students with more opportunities to discuss strategies, assess their mastery of them and build their self-regulation

skills. Students verbalize their own approach to writing by pointing out strengths and weaknesses in their peers' writing using their own success criteria (Panadero et al., 2018). Practicing argumentation through dialogue, therefore, promotes internalization of argumentative skills. Creating groups of two or three students to defend their opinions and listen to those of their peers supports their understanding of the dialogical nature of argumentative discourse.

In our project, we used peer feedback during all steps of the writing process to develop students' self-regulation. Students authored their own texts rather than writing in groups, but used the targeted strategies by co-planning and by revising peers' texts. Discussion of others' texts promotes the internalization of strategies that students will use in their own writing. Teachers play an important role in this feedback loop (Zimmerman & Risemberg, 1997), as they guide students working in teams toward effective forms of feedback that focus on self-regulation (Hattie & Timperley, 2017).

Peer feedback is another effective practice to improve students' revision skills (Bruning & Kauffman, 2016; Graham et al., 2015; MacArthur, 2016; Wigglesworth & Storch, 2012). Specifically, students learning how to give feedback benefit from better comprehension of learning strategies (Boscolo & Ascorti, 2004; Crinon, 2012; Lundstrom & Baker, 2009). This positive effect has been observed even among struggling learners (Crinon & Marin, 2010). Nevertheless, peer feedback's effect on student writing performance is not always significant (De Smedt & Van Keer, 2018a).

5. Explicit Instruction, Teacher Implementation and Practice-Based Professional Development

Studies on teacher implementation of EWI remain rare, especially in primary schools. Finlayson and McCrudden (2020) identified only 13 publications in which primary teachers implemented writing interventions, mainly SRSD. Documenting this scarcity, Palermo and Thomson (2018) report only 3 studies on SRSD models implemented by middle school teachers. Moreover, most of the research on SRSD that includes students with emotional and behavioral disorders (9 out of 11) involves the researcher (McKeown et al., 2014) playing the role of the teacher. Teacher implementation of EWI and its strategies must be tested in classroom settings if we want to achieve long-lasting effects for student learning (Finlayson & McCrudden, 2020).

Teachers' interventions usually have strong effects on writing quality, even though they may experience difficulties in implementing EWI. EWI's effectiveness often relies on teachers' training and treatment fidelity. Of the studies conducted with teachers, one compared teacher-implemented SRSD to Business as Usual (BAU) instruction in 3rd, 4th and 5th grades (McKeown et al., 2016) and found a limited effect on overall text quality (Cohen's $d = .15$) and structure (Cohen's $d = .24$), but the treatment fidelity was low in this study. Collins et al. (2021) studied

teaching of expository essays in social sciences with 3rd grade teachers. They compared an intervention using SRSD to BAU instruction and found an effect size of 1.07 for elements of the targeted genre and .72 for holistic quality of the texts. Palermo and Thomson (2018)'s teacher implementation study compared three conditions: 1) SRSD + feedback via an automated system, 2) BAU + feedback via an automated system and 3) BAU. Within the SRSD group they found an effect size of 1.18 for writing quality of the argumentative essay and one of .97 for essay elements compared to both BAU groups. De Smedt and Van Keer (2018a) compared the effectiveness of four teachers' interventions in 5th and 6th grade: 1) EWI + peer assistance (PA), 2) EWI alone, 3) BAU + PA and 4) BAU alone. EWI and PA groups outperformed the BAU group (effect sizes of between 1.94 and 2.14 for EWI and 1.43 for the PA writing program).

Effect sizes in these studies, although strong, are generally smaller than the ones (Cohen's d = 1.59) reported in a meta-analysis by Graham and Harris (2017). Nevertheless, it should be noted that most of the studies reported in this meta-analysis are based on interventions in which the researcher intervenes directly with a student or with subgroups of students. Rarely, the researcher intervenes with all the students in the class. Most EWI studies using teacher-provided instruction address this implementation issue by planning a professional development program to coach teachers in intervening with all their students. This teacher support before and during the intervention is part of practice-based professional development (PBPD). Several studies showed positive results when the teachers themselves intervened with their students in keeping with the following PBPD principles (Festas et al., 2015; McKeown et al., 2019):

> (a) collective participation of teachers within the same school with similar needs; (b) basing professional development around the characteristics, strengths, and needs of the students […]; (c) attention to content knowledge needs of teachers, including pedagogical content knowledge; (d) opportunities for active learning and practice of the new methods being learned […]; (e) use of the materials […] that are identical to those to be used in the classroom; and (f) feedback on performance while learning and before using these methods in the classroom (Harris et al., 2012, p. 105).

But following PBPD's principles does present challenges for the classroom context. In a single case study on SRSD implementation, McKeown et al. (2019) highlighted the difficulty of training teachers to teach SRSD to the whole class, because they do not have time to ensure that all students have mastered the target strategies. Other implementation challenges include interrupted lessons, uneven teacher engagement and classroom schedule disruptions.

To explain the variation of effect sizes when teachers teach writing strategies, McKeown et al. (2019) pointed out that differences in writing quality are difficult to observe over a short period of time. Overall, teaching teachers to use explicit

instruction poses challenges that previous intervention studies have not always addressed. Nonetheless, because teaching generally takes place in the classroom with the whole class and without researcher input, effective methods should be tested under conditions that are as similar as possible to teaching practice.

6. Our Theoretical Framework for EWI

To put EWI into practice in the Quebec culture, we adapted Graham and Harris's (2005) model for explicit SRSD instruction. Our interactionist approach (see De Smedt and Van Keer, 2018a and b) relies more on students' verbalization of the strategy used than on memorization of the strategies as in SRSD. Much like De Smedt and Van Keer, we used visual supports to present the procedure for using strategies. Our model had six iterative phases: 1) showing how strategies work, 2) modeling, 3) guiding students' practices by focusing on scaffolding and promoting student collaboration for better verbalization of strategies, 4) fostering independent practice, 5) transferring the strategies to students' writing tasks and 6) questioning students about their use of the targeted strategy and their self-regulation activity. Metacognitive questioning by and feedback from teachers in these different phases are two essential practices to ensure that the intervention is adjusted to fit students' capacities. To this end, questioning should focus more on the process (how students mobilize the strategy and their level of control over it) than on the product expected. Information obtained through these questions will allow teachers to identify subgroups of students who are experiencing difficulties and then to support them (for a more detailed description, see Falardeau, 2021).

7. The Present Study

Few EWI studies that tested an intervention's effectiveness have been conducted with teachers implementing it. More research of this type is needed, as it is more ecologically valid. It is therefore important to study teacher-led EWI intervention, as well as to do so in the Quebec context where it has not been evaluated rigorously. Our study is in line with other studies (e.g., Festas et al., 2015) that aimed to validate, in different cultural contexts, the effectiveness of teacher-led EWI interventions. Writing instruction practices that develop self-efficacy in classroom contexts are likewise little studied (Bruning & Kauffman, 2016).

To adapt EWI for use in a French-speaking culture (Quebec, in Canada), we worked with teachers and pedagogical advisors to develop an intervention tailored to Quebec's school curriculum. We also included peer feedback to see how 5th grade students (ages 10–11) could benefit from critically reading their peers' argumentative texts to improve their own writing performance and self-efficacy. Given the lack of clear evidence regarding the effects of peer feedback on writing

performance and self-efficacy (De Smedt & Van Kleer, 2018a) in a teacher-led intervention, further research combining peer feedback and EWI is needed.

In our study, we have focused on the opinion letter, a type of writing that in Quebec is the subject of a provincial test at the end of 6th grade and for which there are few teaching materials. The reason why argumentative writing is so important in elementary school is that it is a critical skill for becoming an engaged member of society: the student who can support a thesis with arguments backed up by evidence will be better equipped to advance and support their point of view.

The purpose of this research, then, is to compare the writing performance and self-efficacy of 5th grade students writing argumentative texts before and after an intervention. The study design included three conditions. The first experimental group combined peer feedback with EWI (EWI+PF) while the second experimental group used only EWI without peer feedback. Teachers in the control group conducted business-as-usual interventions (BAU). This allowed us to isolate the impact of EWI with and without peer feedback.

Our hypotheses were as follows:

- Hypothesis 1: The writing performance and writing self-efficacy of students who receive explicit writing strategy instructions (experimental groups 1 and 2) will improve more than those of students in the control group (Control).
- Hypothesis 2: The writing performance and writing self-efficacy of students who receive explicit writing instruction and practiced peer feedback (EWI+PF) will improve more than those of students who were not trained in this intervention (EWI only and Control).

To ensure that the observed differences between the groups could be attributed to teachers' implementation of writing instructional practices, we controlled for the gender and age of the students. Gender may influence writing performance and self-efficacy (Graham et al., 2017). Controlling for age is also important because students' writing skills improve unevenly with age in elementary school (Fayol, 2016). Age is also related to self-efficacy, although the complexity of the writing task plays a greater role for this outcome (Bruning & Kauffman, 2016).

8. Method

8.1 Participants and Procedure

In our quasi-experimental study, the first group (EWI+PF) consisted of students taught by 8 teachers from 7 schools; the second group (EWI) consisted of students taught by 8 teachers from 3 schools; the Control group consisted of students taught by 9 teachers from 5 schools. Data was collected at two points during the 2020–2021 school year: a pre-test in September (Time 1; T1) and a post-test (Time 2; T2) in May

or June 2021, after the intervention (teachers ran the intervention between April and June 2021 at a time of their choosing, based on their planning for the year). All 25 teachers in the three groups completed the research project. Students wrote an opinion letter at the post-test, one week after their teachers finished teaching the opinion letter.

Regarding gender, 236 girls and 247 boys participated in this study, proportionally distributed among the three groups. Appendix A presents the characteristics of the students in the three groups. Most students were aged between 9 and 10 (88.4%). Overall, their characteristics were similar, except that the EWI+PF group was slightly younger than the two other groups. In all three groups, a similar proportion of students had French as their first language (88.3% in EWI+PF; 88.8% in EWI; 85.4% in the Control group). The difference of 2.8% and 3.4% between the Control group and the experimental groups is not significant. To measure the socio-economic level of the schools, we used the School Socio-Economic Index (SSEI) developed by the Quebec Ministry of Education. This index uses a scale of 1 to 10, with 1 representing the most advantaged and 10 the most disadvantaged schools. Both experimental groups had a higher average index than the Control group (an average SSEI of 4.67 for the Control group versus 6.33 for the EWI group and 7.25 for EWI+PF). The Control group was therefore socio-economically more advantaged than the two experimental groups. However, we did not take this covariate into account in our analysis as we did not have enough schools to do so (n=14).

8.2 Research Design

Participating schools were randomly assigned to one of the three groups. To avoid any threat to the internal validity of the study, teachers were not randomly assigned to the three groups. If teachers had been assigned randomly, teachers working in the same school could have been be assigned to different groups and thus could have discussed the content material learned in each group, potentially endangering the validity of the study.

8.2.1 Experimental Group with Peer Feedback (EWI+PF)

In the first experimental group, teachers implemented explicit instruction with peer feedback in each guided practice activity. Our research team, in collaboration with 5th grade teachers and elementary school consultants, developed an explicit instructional sequence following our EWI model (presented in the theoretical framework). The sequence contained 15 lessons of approximately 90 minutes each, delivered over a period of 6 to 8 weeks. According to Palermo and Thomson (2018), EWI generates positive effects after 8 to 12 lessons of 20 to 45 minutes. We chose to teach five writing strategies related to the opinion letter: 1) analysis of the reader's characteristics in order to build convincing arguments and directly appeal to the

reader; 2) argumentative consistency between the theme of the letter, the opinion defended, the arguments and the justifications; 3) the structure of the opinion letter and all its required elements; 4) the use of a rich and varied vocabulary and 5) the use of exclamatory, interrogative and imperative sentences to increase the reader's interest. Each of these five strategies was taught in the specific context of opinion letters. For example, in the modeling phase, teachers showed students how they analyzed their reader's characteristics to plan their letter. Students practiced each of the five strategies at least three times under different conditions of increasing complexity: once by analyzing letters written by unknown students and modified by the researchers to highlight strengths or weaknesses; a second time to improve the letter the student had written in the pre-test; and a third time after the student had written a new letter during the intervention. Students wrote their own opinion letters and learned to plan and revise them with the help of their peers. During each guided practice, students were divided into teams of three to discuss their use of the strategy and to give and receive feedback. The intervention followed this structure:

Lesson #	Content	Lesson #	Content
1	Analysis of the reader's characteristics	9	Feedback and analysis of the reader's characteristics
2	Feedback and analysis of the reader's characteristics	10	Feedback and use of a rich and varied vocabulary
3	Consistency of argumentation	11	Analysis of the reader's characteristics in a new letter
4	Use of exclamatory, interrogative, and imperative sentences	12	Structure of a new opinion letter
5	Structure of the opinion letter	13	Feedback and consistency of argumentation in a new letter
6	Consistency of argumentation and planning of a new letter	14	Revision of the vocabulary in a new letter
7	Use of a rich and varied vocabulary	15	Revision of varied sentences in a new letter
8	Feedback and structure of the opinion letter		

Each lesson featured a script written by our research team, accompanied by a video explaining to teachers the rationale behind how the session was organized.[ii] We also made anchor charts based on those proposed by Calkins (Martinelli & Mraz, 2015/2017) to make the process of using each strategy explicit to students. To develop their self-regulation, students were asked to verbalize with their peers how

they used the strategy. During guided practice, the teacher met with each student individually to help them identify learning goals. As students strengthened their mastery of the strategies and self-regulation, the teacher lessened scaffolding (De Smedt & Van Keer, 2018a).

The instructional sequence also included lessons dedicated to the explicit teaching of peer feedback. These lessons were always linked to a strategy to teach students how to give feedback on specific content. Students were provided with an anchor chart outlining how to give and receive feedback: 1) give positive feedback on the text; 2) give feedback on a specific aspect of the text that needs to be improved; and 3) provide concrete examples or solutions. The teacher described the feedback strategy, modeled it and showed the whole class how to do it by bringing a team of students into the center of the class and guiding them in giving feedback. During the guided practice, the teacher referred to the anchor chart to remind the students of how to give feedback. This reference to the chart was intended to develop students' self-regulation by encouraging them to reflect on what they are doing as they give feedback.

Following the principles of practice-based professional development (PBPD; McKeown et al., 2014), which prescribes two days of teacher training prior to classroom intervention, we first met with teachers in both experimental groups for half a day to introduce them the EWI model and the research process. We then provided them with online training modules about the explicit teaching model we used, accompanied by a theoretical article (Falardeau, 2021), and the theoretical foundations for the use of peer feedback. We also asked them to read the first three lesson scenarios, accompanied by explanatory videos (seven to eight hours of reading and listening). Once this step was completed, teams of teachers from each school met for half a day. This meeting with the principal investigator ensured that there was a shared understanding by providing an opportunity to clarify all components of the research.

Once a week, teachers in the experimental groups filmed one of their lessons. The video was viewed by the researcher, who used an observation grid listing all teaching practices related to our explicit teaching model. Each item was to be rated on a 5-point Likert scale based on adherence to the lesson script, where 1 = *not at all* and 5 = *absolutely*, with space to justify ratings based on observed interventions. This video analysis was followed by a weekly 30-minute virtual meeting in which the researcher encouraged good practices that adhered to the script and reviewed items that needed improvement. After a few meetings, the eight teachers of the EWI+PF group taught all components of the lessons.

8.2.2 Experimental Group with Individual Writing (EWI)

For the second experimental group, the explicit teaching approach and the support offered to the teachers were identical to those of the first group, except that the

students never worked in collaboration with their peers. All guided practice activities were done individually with teacher support.

8.2.3 Control Group

The teachers in the Control group taught the opinion letter in their usual way. When they finished their teaching, we met with each teacher and asked them to list the content and the practices they used. Most used Calkins' writing workshops (e.g., Calkins & Boland Hohne, 2013/2019), selecting various activities for mini-lessons. Some conducted sharing activities on creating arguments or had students work in teams to strengthen their arguments. Others taught only the structure of the opinion letter before the post-test. All of them had received the list of the five strategies we chose to teach the opinion letter (1) analysis of the reader's characteristics; 2) consistency of the argumentation; 3) the structure of the opinion letter and all the elements expected; 4) the use of a rich and varied vocabulary and 5) the use of exclamatory, interrogative and imperative sentences), but were not given any indication of how these strategies worked or how to teach them. We gave them this list to minimize the dropout rate, which is usually higher in a Control group than in experimental groups (Guay et al., 2020). They did not have any access to the training or our teaching material during their teaching of the opinion letter. We gave them the material after the completion of the post-test.

8.3 Measures

8.3.1 Perceived Self-Efficacy in Writing

Items used to measure self-efficacy regarding writing skills were drawn from Bruning et al. (2013). We used two of the three subcategories of their self-efficacy scale (*ideation* and *regulation*) without alteration. We adapted the *convention* category to the content we taught, because our intervention did not address spelling or grammar. Of the 14 items added, 2 focused on reader awareness (e.g., *I can think about my reader, his/her ideas, his/her age, to convince him/her of my opinion*), 2 focused on consistency (e.g., *I can find convincing reasons [arguments] to support my opinion*), 3 focused on structure (e.g., *I can write an introduction announcing my opinion and my reasons [arguments]*), 3 focused on the use of imperative, interrogative, or exclamatory sentences (e.g., *I can use interrogative sentences [questions] in my text to make my reader think*), and 4 focused on peer feedback (*I can offer another student clear comments and examples to help him/her improve his/her text*). We used a Likert scale ranging from 0 (*Not confident at all*) to 100 (*Absolutely confident*). The alpha coefficient for this measure was .92 (see Appendix B for the complete scale, translated from French).

8.3.2 Writing Measures

We measured students' writing performance at T1 and T2. Students in all three groups completed the same pre-test in September, choosing one of six prompts that addressed themes rooted in their culture and environment (e.g., *Your school wants to make uniforms mandatory. Do you agree? Write to your principal to convince him or her of your opinion* or *Do you think it's a good idea to have a cell phone at school? Write to your principal and convince him or her of your opinion*). Because the need for autonomy is a key factor in writing engagement (Guay et al., 2020), we wanted to enhance their motivation by offering them a wide choice of prompted writing. The writing task required no reading materials, so that the students' reading skills would not interfere with their writing skills. All the instructions had the same reader, the school's principal. A panel of researchers and 5th grade teachers validated the equivalence of difficulty levels between the six pre-test prompts and the six post-test ones. All presented the same level of difficulty, due to the unique identity of the intended reader and the anchoring of all themes in the students' culture. Students were given no indication of length or writing time and no support was allowed.

The post-tests were conducted in May and June, one week after each teacher had finished teaching the opinion letter. The conditions of the test were identical to those of the pre-test, and the same reader was kept. Only the prompts were changed (e.g., *Many experts say that young people should use electronic devices less at home. Do you agree? Write to your principal to convince him or her of your opinion* or *Spring break could be two weeks instead of one. However, summer vacation would be shortened by one week. Which would you prefer? Write to your principal to convince him or her of your opinion*).

Research assistants rated the students' pre-test and post-test letters in all three groups to ensure that the criteria were applied consistently. While teachers could use the pre-test letters to enhance the structure and content of students' letters, neither teachers nor students saw the results of our research assistants' (RAs') rating.

Bouwer et al. (2024) argue that the definition of writing adopted to assess students' capacities must be based on "the overall aim of the writing intervention" (p. 202). Accordingly, the score given to the letters was based on the strategies taught:

1. Reader awareness: analyzing the reader's characteristics and directly speaking to the reader in the letter (10 pts/75)
2. Consistency of the argumentation (divided into two criteria):
    a. Progression of information and noncontradiction (10 pts/75)
    b. Relevance and development of ideas (15 pts/75)
3. Structure and elements of the letter (10 pts/75):

   a. Introduction, development, and conclusion
   b. Progression of the information and noncontradiction

4. Use of rich and varied vocabulary (20 pts/75):

   a. Vocabulary richness (adding points)
   b. Vocabulary error, distracting repetition, vagueness (subtracting points)

5. Use of various types of sentences to convince the reader: interrogative, exclamative or imperative (10 pts/75)

Criteria were weighted according to the points awarded by the Quebec Ministry of Education for the opinion letter portion of the 6th grade provincial test. The weighting therefore reflects the relative importance given in Quebec to the different components of writing. Using multiple criteria for quality of argumentation enabled us to examine students' progression for each strategy, rather than simply using a general score for content and another for the presence of expected elements (structure). The weighted criteria were added to calculate the overall score. This rating procedure is innovative compared to the general performance score we observed in most studies of EWI studies, and enabled a more refined analysis of student progress. For example, McKeown et al. (2019), De Smedt et al. (2018 a-b and 2020), Graham et al. (2017), Harris et al. (2012), Graham et al. (2005) assessed overall text quality rather than considering multiple criteria as we did. Other studies did not even assess overall quality, only the number of words and the presence of expected structural elements (Festas et al., 2015). Although benchmarks are a recommended assessment method (Bouwer et al., 2023), we opted not to use them because we wanted to evaluate each criterion in isolation to better understand how students progressed with each strategy taught.

Before scoring the pre-test, we trained the RA to evaluate the opinion letters. We collected 22 letters from a 5th grade test class that was not involved in the project, and the four assistants corrected each of these letters during summer 2020, before the experiment began. This procedure allowed us to refine the performance indicators for each criterion. According to Van Gass et al. (2019), such training using various performance levels is a good way to improve an RA's comprehension of text quality criteria.

We scored using the ratings A-B-C-D-E, with A referring to an excellent grade (clearly above expectations), B to a very good grade, C to an acceptable grade, and D and E indicating that the student did not meet expectations for the criterion being assessed. We used the following scale to convert letters to numbers: A=10/10; B=8/10; C=6/10; D=3/10 and E=0/10 (see Appendix C for an example of a descriptive scale for awarding points based on the level of success on criterion 1). A similar scale out of 15 total points was used for the *relevance and development of ideas* criterion and out of 20 for the *vocabulary* criteria.

The first three classes' work was rated by multiple RAs (2 or 4 raters; see Table 1). We calculated inter-rater agreement for the six criteria described above based on 25 students per group. The coefficients ranged between .69 and .98, which is an adequate level of reliability. Correlations among the six criteria within each group (EWI+PF, EWI, Control) are presented in Appendix D and provide good support for the metric's test-retest fidelity and its convergent and divergent validity.

Table 1. Inter-rater correlations

Criteria	Teacher #1 T1 4 raters	Teacher #4 T1 2 raters	Teacher #7 T2 4 raters
Reader awareness	.84	.73	.81
Consistency (progression)	.90	.69	.79
Consistency (development)	.88	.84	.93
Structure and elements	.98	.95	.76
Vocabulary	.94	.82	.95
Use of various types of sentences	.89	.80	.90

Based on these agreements, we used the following process to assess the 22 other classes. The RA rated all letters using the indicators in our scoring guide. Each of the 25 groups was assigned to one RA, and within each group, three letters were rated by all four RAs in validation meetings to ensure that they were all applying the criteria consistently. To avoid any disparity in understanding and applying the criteria, any indecision regarding scoring was brought back to the team at the validation meetings for discussion to reach a unanimous decision. Bouwer et al. (2024) recommend this monitoring of RA rating throughout the process to ensure that criteria are understood and applied consistently.

8.4 Data Analysis

We performed an analysis of covariance (ANCOVA) with the PROC MIXED procedure of SAS® (version 9.4) to test our research hypotheses. Fundamental to each hypothesis is the group*time interaction, which we expected to be significant. When the group*time interaction term was significant, simple effects were calculated. The multilevel structure of the data was considered, with students nested in their classroom. Analyses were conducted on the following dependent variables: perceived self-efficacy, overall achievement score and the six criteria composing this score. The covariates for each of these analyses were student gender and student age. The analyses were all performed with multiple imputations for handling missing values (see Table 2).

Table 2. Mean, Standard Error, p-value and Cohen's d for Self-Efficacy, Assessment Criteria and Overall Score, with Multiple Imputations

	T1		T2		p	Cohen's *d*
	n	Adjusted Mean (SE[a])	n	Adjusted Mean (SE)		
Self-efficacy						
EWI+PF[b]	162	68.17 (2.02)	162	79.45 (2.01)		
EWI[c]	157	70.56 (2.08)	157	77.74 (2.09)		
Control	164	72.38 (2.11)	164	74.19 (2.07)		
Interaction group x time					<.001	
T1: EWI+PF vs. EWI					1.00	.09
T2: EWI+PF vs. EWI					1.00	.07
T1: EWI+PF vs. contr[d]					.45	.16
T2: EWI+PF vs. contr					.21	.20
T1: EWI vs. contr					1.00	.07
T2: EWI vs. contr					.69	.14
EWI+PF: T1 vs. T2					<.001	.43
EWI: T1 vs. T2					<.001	.30
Contr: T1 vs. T2					.93	.07
Reader awareness						
EWI +PF	162	5.35 (.22)	162	7.21 (.21)		
EWI	157	5.28 (.21)	157	7.06 (.20)		
Control	164	4.81 (.21)	164	5.71 (.21)		
Interaction group x time					.002	
T1: EWI+PF vs. EWI					1.00	.03
T2: EWI+PF vs. EWI					1.00	.06
T1: EWI+PF vs. contr					.24	.20
T2: EWI+PF vs. contr					<.001	.56
T1: EWI vs. contr					.33	.18
T2: EWI vs. contr					<.001	.52
EWI +PF: T1 vs. T2					<.001	.53

	T1		T2		p	Cohen's *d*
	n	Adjusted Mean (SE[a])	n	Adjusted Mean (SE)		
EWI: T1 vs. T2					<.001	.55
Contr: T1 vs. T2					<.001	.27
Consistency: Progression of ideas						
EWI+PF	162	6.37 (.16)	162	7.58 (.14)		
EWI	157	6.57 (.14)	157	7.52 (.14)		
Control	164	6.24 (.14)	164	7.08 (.14)		
Interaction group x time					.13	
Consistency: Development of ideas						
EWI+PF	162	7.84 (.25)	162	9.86 (.26)		
EWI	157	7.85 (.25)	157	9.75 (.25)		
Control	164	7.47 (.25)	164	9.69 (.25)		
Interaction group x time					.64	
Structure and elements						
EWI+PF	162	3.20 (.30)	162	8.13 (.28)		
EWI	157	2.99 (.29)	157	7.16 (.29)		
Control	164	3.66 (.29)	164	6.34 (.29)		
Interaction group x time					<.001	
T1: EWI+PF vs. EWI					1.00	.06
T2: EWI+PF vs. EWI					.06	.27
T1: EWI+PF vs. contr					.75	.12
T2: EWI+PF vs. contr					<.001	.49
T1: EWI vs. contr					.30	.18
T2: EWI vs. contr					.12	.22
EWI+PF: T1 vs. T2					<.001	1.10
EWI: T1 vs. T2					<.001	.92
Contr: T1 vs. T2					<.001	.54

	T1		T2		p	Cohen's *d*
	n	Adjusted Mean (SE[a])	n	Adjusted Mean (SE)		
Vocabulary						
EWI+PF	162	12.23 (.26)	162	15.14 (.25)		
EWI	157	12.84 (.24)	157	15.10 (.24)		
Control	164	12.68 (.24)	164	14.48 (.24)		
Interaction group x time					.002	
T1: EWI+PF vs. EWI					.24	.19
T2: EWI+PF vs. EWI					1.00	.01
T1: EWI+PF vs. contr					.57	.14
T2: EWI+PF vs. contr					.15	.21
T1: EWI vs. contr					1.00	.05
T2: EWI vs. contr					.21	.20
EWI+PF: T1 vs. T2					<.001	.82
EWI: T1 vs. T2					<.001	.71
Contr: T1 vs. T2					<.001	.52
Use of various types of sentences						
EWI+PF	162	5.63 (.21)	162	7.50 (.20)		
EWI	157	5.56 (.21)	157	7.13 (.20)		
Control	164	5.27 (.21)	164	6.26 (.21)		
Interaction group x time					.01	
T1: EWI+PF vs. EWI					1.00	.03
T2: EWI+PF vs. EWI					.63	.15
T1: EWI+PF vs. contr					.69	.13
T2: EWI+PF vs. contr					<.001	.47
T1: EWI vs. contr					1.00	.11
T2: EWI vs contr					.01	.33
EWI+PF: T1 vs. T2					<.001	.55
EWI: T1 vs. T2					<.001	.45

	T1		T2		p	Cohen's *d*
	n	Adjusted Mean (SE[a])	n	Adjusted Mean (SE)		
Contr: T1 vs. T2					<.001	.30
OVERALL SCORE						
EWI+PF	162	40.62 (.84)	162	55.42 (.84)		
EWI	157	41.07 (.84)	157	53.71 (.83)		
Control	164	40.15 (.83)	164	49.57 (.81)		
Interaction group x time					<.001	
T1: EWI+PF vs. EWI					1.00	.04
T2: EWI+PF vs. EWI					.45	.16
T1: EWI+PF vs. contr					1.00	.04
T2: EWI+PF vs. contr					<.001	.56
T1: EWI vs. contr					1.00	.09
T2: EWI vs. contr					.001	.40
EWI+PF: T1 vs. T2					<.001	1.33
EWI: T1 vs. T2					<.001	1.12
Contr: T1 vs. T2					<.001	.89

Note. The *p*-value is adjusted by the Bonferroni correction for comparisons between groups or between times.

[a] SE: standard error

[b] EWI+PF: Explicit Instruction + Peer Feedback group

[c] EWI: Explicit Instruction only

[d] Contr: Control group

Covariables: Student age and student gender (see Appendix E)

9. Results

The pattern of missing values is presented in Table S1 (see Online Supplement). Students who responded at T1 only or were evaluated only once (T1 or T2) by their teacher have similar scores compared to students for whom we have data at both times. The Little's MCAR tests were not significant for self-efficacy variables ($x^2_{(116)} = 109.32$; $p = .66$) nor for evaluation criteria ($x^2_{(12)} = 10.79$; $p = .55$). Data are thus MCAR.

Although missing values do not represent a potential bias to the precision of statistical estimates, we used multiple imputations with 20 estimated samples generated to keep a sufficient degree of statistical power. Consequently, analyses were performed 20 times for each of the 20 samples generated. Once these analyses were performed, the MIANALYSE function synthesized the 20 results into a single result. This procedure enabled us to calculate statistical parameters such as adjusted means and differences between groups and time with their *p*-value. Results with multiple imputations are presented in Table 2 and Figures 1 to 6, while results without multiple imputations are presented in Table S2 of the online supplement. When the group*time interaction term was significant (p .05), we compared the results between the groups for T1 and T2, as well as the results between the two times for each group. Of the eight dependent variables presented in Table 2, only the two related to consistency (progression of information and noncontradiction; relevance and development of ideas) did not have a significant interaction term. Our substantive interpretations below are based only on significant interaction terms. Main effects are not interpreted. Cohen's *d* was calculated to measure the effect sizes. According to Cohen (1992), a *d* of 0.2 corresponds to a weak effect, 0.5 to a medium effect, and 0.8 to a strong effect. Effects of covariates (age and gender) are presented in Appendix E.

9.1 Self-Efficacy

For self-efficacy, we observed a baseline equivalence (see Figure 1). There is no significant difference among the three groups at T1. However, it should be noted that students in the Control group had slightly higher scores at T1 than students of the EWI+PF group, as evidenced by the Cohen's *d* of .16. We observed an increase between T1 and T2 for the two experimental groups, with Cohen's $d = .43$ for EWI+PF and .30 for EWI. For the Control group, the increase is small, with a Cohen's *d* of .07. Surprisingly, these within-subject differences did not translate into significant differences among the three groups at T2. However, based on Cohen's *d*, some differences are worth noting, though small in magnitude. This is the case for the difference between EWI+PF and the Control group (.20) and between EWI and the Control group (.14). Based on these results, we can conclude that both

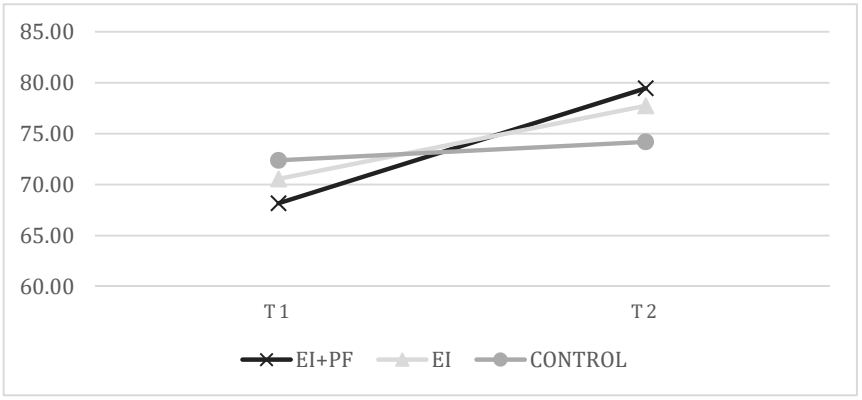

Figure 1. Self-Efficacy Scores at T1 and T2 by Group.

experimental groups produced a degree of increase in students' self-efficacy scores that the Control group did not.

9.2 Reader Awareness

For *reader awareness*, we again observed a baseline equivalence (see Figure 2). There were no significant differences among the three groups, though Cohen's *d* values tended to reveal small differences, especially between the two experimental groups and the Control group. We observed an increase between T1 and T2 for the two experimental groups as well as for the Control group (Cohen's *d* for EWI+PF = .53; EWI = .55; Control = .27).

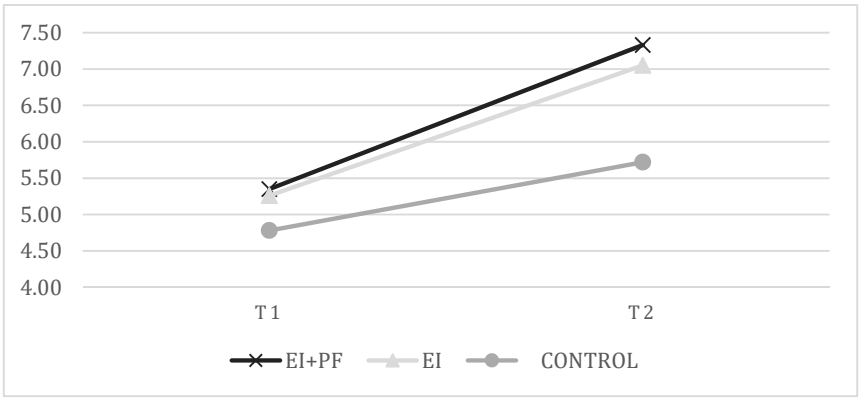

Figure 2. Reader Awareness at T1 and T2 by Group.

In contrast to self-efficacy, there are significant differences in reader awareness between groups at T2, especially between the two experimental groups and the Control group, with a Cohen's *d* of .52 (EWI) and .56 (EWI+PF). Based on these results, we can safely conclude that both experimental groups produced an increase in students' reader awareness scores that was greater than that of the Control group.

9.3 Structure and Elements

For *structure and elements*, we observed a baseline equivalence with no significant difference among the three groups at T1 (see Figure 3). We observed an increase between T1 and T2 for the two experimental groups as well as for the Control group (Cohen's *d* for EWI+PF = 1.10; EWI = .92; Control = .54), but with greater effect sizes for the two experimental groups. There were also meaningful differences among the three groups at T2, especially between the EWI+PF group and the Control group (.49). Based on these results, we can conclude that the PF component of the EWI intervention had an added value for this dependent variable. However, it should be noted that there was no significant difference at T2 between EWI+PF and EWI, nor between EWI and the Control group.

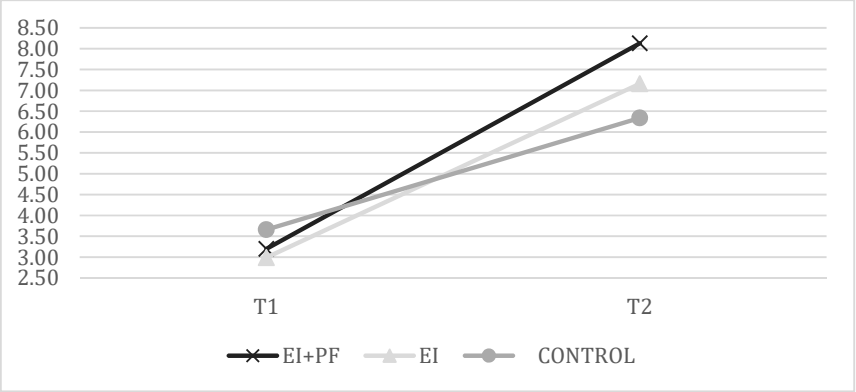

Figure 3. Structure and Elements at T1 and T2 by Group.

9.4 Vocabulary

For *vocabulary*, we again observed a baseline equivalence, with no significant difference among the three groups at T1 (see Figure 4). We observed an increase between T1 and T2 for the two experimental groups as well as for the Control group (Cohen's *d* for EWI+PF = .82; EWI = .71; Control = .52), but with greater effect sizes

for the two experimental groups. Surprisingly, these differences do not translate into significant differences among the three groups at T2.

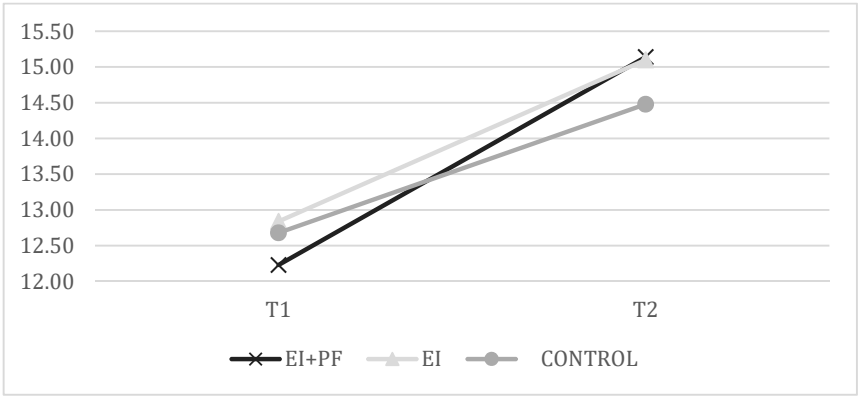

Figure 4. Vocabulary at T1 and T2 by Group.

However, based on Cohen's *d*, some differences are worth noting, though small in magnitude. This is the case for the difference between EWI+PF and the Control group (.21) and between EWI and the Control group (.20). Based on these results, we can conclude that both experimental groups produced an increase in students' vocabulary scores that was greater than that of the Control group.

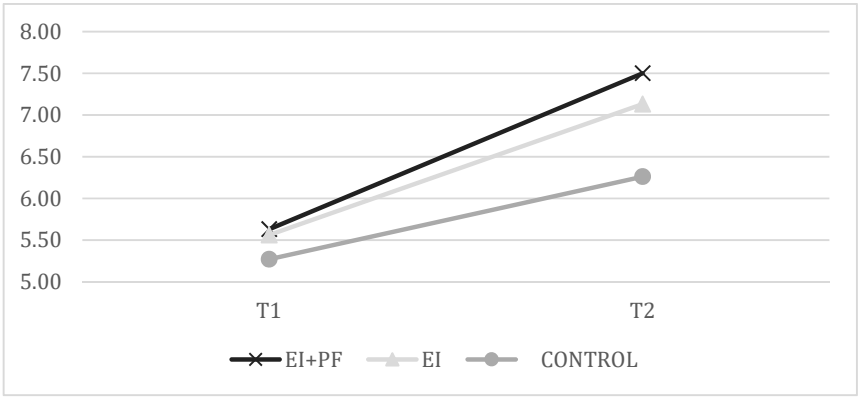

Figure 5. Use of Various Types of Sentences at T1 and T2 by Group.

9.5 Types of Sentences

For *use of various types of sentences*, we again found a baseline equivalence (see Figure 5). There are no significant differences between the three groups at T1. We observed an increase between T1 and T2 for the two experimental groups as well as for the Control group (Cohen's *d* for EWI+PF = .55; EWI = .45; Control = .30). There were also significant differences between groups at T2, especially between the two experimental groups and the Control group with a Cohen's *d* of .47 (EWI) and .55 (EWI+PF). Based on these results, we can safely conclude that both experimental groups produced an increase in student scores for the use of various types of sentences that was greater than that of the Control group.

9.6 Overall Score

For the *overall score*, once again we observed a baseline equivalence (see Figure 6). There were no significant differences between the three groups at T1. We observed an increase between T1 and T2 for the two experimental groups as well as for the Control group (Cohen's *d* for EWI+PF = 1.33; EWI = 1.12; Control = .89). There were also significant differences between groups at T2, more precisely between the two experimental groups and the Control group with a Cohen's *d* of .56 (EWI+PF vs. Control) and .40 (EWI vs. Control). Based on these results, we can safely conclude that both experimental groups produced an increase in students' overall scores that was greater than that of the Control group.

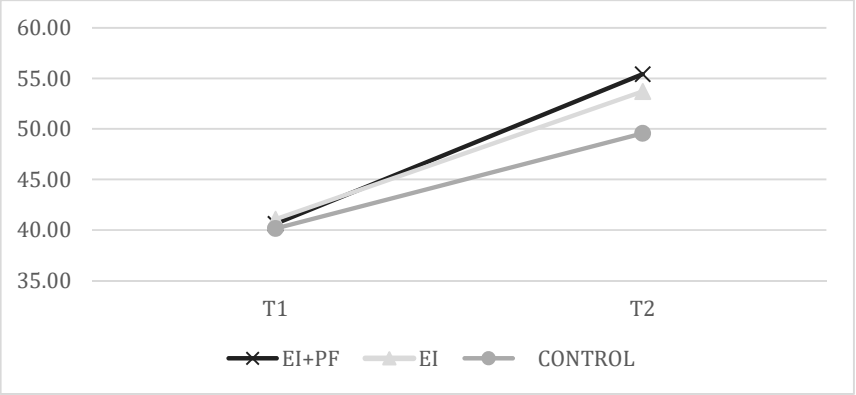

Figure 6. Overall Score at T1 and T2 by Group.

10. Discussion

The purpose of our study was to compare 5th grade students' writing performance and self-efficacy before and after two interventions: explicit instruction with peer

feedback (EWI+PF) and explicit instruction without peer feedback (EWI), with a BAU control group. Regarding overall writing performance, students' scores improved substantially in all three groups between Time 1 and Time 2 (large effect sizes). However, this increase was greater in the two experimental groups, as students' scores differed from those of the Control group at T2. Regarding the six writing criteria assessed, we found a significant increase in students' scores for *reader awareness*, *structure* and *use of various types of sentences* for the two experimental groups (EWI and EWI+PF). The effects were more tenuous for students' *vocabulary scores*, and we found no effect for the two criteria related to *consistency*. Students' self-efficacy scores increased slightly between T1 and T2 in both experimental groups but stagnated in the Control group. Overall, the results provide support for the EWI intervention itself and for EWI plus peer feedback. Because there was no statistical difference between the two experimental groups, we cannot conclude that peer feedback had any effect on students' writing performance and self-efficacy, only for one criterion relating to structure and elements. However, peer feedback did not negatively affect students' results either.

10.1 Teacher Implementation

Although teachers in the Control group used adequate pedagogical practices, teachers in the two experimental groups seemed more effective in fostering self-efficacy and improving writing performance. This means that the EWI intervention that we implemented in the classroom by training the teachers is an adequate method for developing primary school students' writing skills. It thus compares favorably to other EWI interventions implemented by teachers (Harris et al., 2012; McKeown et al., 2016, 2019; De Smedt & Van Keer, 2018a and b; Collins et al., 2021). One innovative aspect of our study is that it was the first transposition of EWI to a French-language school system. Our study provides evidence for EWI's effectiveness in the Quebec school system.

10.2 Effects of Explicit Instruction on Writing Performance Criteria

The two performance criteria for which we found no significant group by time interaction were those that are the most complex for students to master, namely the progression and development of ideas. To explain these findings, we argue tentatively that two months of intervention may not be enough for students to master these two writing abilities. The effects were more pronounced for writing performance criteria relating to more accessible skills such as reader awareness, the use of various types of sentences, and vocabulary. For structure and elements of the letter, we found an even more pronounced effect when explicit instruction was combined with peer feedback: peer discussion about the letter's structure apparently helps students to master this component. Our criteria enabled us to refine our analysis of writing performance and to find, for example, that students in

the experimental groups outperformed those of the Control group on specific content but not on others.

However, it is difficult to compare these results with those of other studies, because other studies using EWI interventions did not analyze the writing's overall content quality with reader awareness and consistency criteria as we did. As discussed in the Method section, past studies have used a variety of indicators of learning progression, such as overall writing score, adherence to structure and word count, although this last variable is not always a reliable indicator of text quality (Graham et al., 2017). These studies do not provide information on specific components of writing that may not be positively affected by EWI, such as progression and development of ideas. We therefore believe that further research should be conducted using a multidimensional evaluation grid of writing performance to shed further light on the conditions under which EWI allows the development of complex skills such as argumentative consistency.

10.3 Peer Feedback Effects on Writing Achievement

Our findings provide support for EWI interventions, but limited support for the added value of peer feedback, at least as regards the variables measured. No significant differences were found between the two experimental groups, except on the structure criterion, even though the effect sizes between T1 and T2 were higher for the EWI+PF group. While these results seem to contradict the literature reviews of Panadero et al. (2018), Koster et al. (2015), Prata et al. (2019) and Graham et al. (2015), who report that peer feedback had a significant effect on writing performance, they are supported by several other studies on the effects of explicit instruction combined with peer feedback. Graham et al. (2005) implemented interventions for narrative and argumentative writing by comparing the effects of using SRSD with or without peer support. They found no significant difference between the experimental groups. De Smedt and Van Keer (2018a) implemented a research design comparing interventions with or without peer feedback in 5th and 6th grade classrooms. They found no significant difference between individual writing groups and peer-assisted groups, only significant effects for the effectiveness of explicit instruction. They replicated their study, integrating peer feedback into all phases of the writing process and providing more peer assistance in teaching descriptive writing (De Smedt et al., 2020). In that study, the EWI+PF group outperformed the EWI and Control groups.

These inconsistent results highlight the need for more research comparing groups with and without peer assistance (including feedback) at the end of primary school. De Smedt et al. (2020) suggest that this collaboration is effective in EWI when collaboration is a real object of instruction. Although we made peer feedback anchor charts for students and trained teachers (including after viewing their class videos) on how to explicitly teach peer feedback to their students, it does not seem

to have been sufficient for effectively implementing such a complex learning activity. The videos we saw suggested that most students did not really know what to do with peer feedback periods unless their teacher joined their team to scaffold questions about their peers' work. Teachers thus played an essential catalytic role, modeling questions and referring students to their anchor charts. This mediation seems a worthwhile avenue for strengthening the effectiveness of peer feedback for writing learning.

10.4 Effects of the Intervention on Self-Efficacy

Self-efficacy is a self-perception that students develop over a long period of time. Students gradually build up their perception of their capability over the course of their success. While many studies support the positive relationship between self-efficacy and writing performance (MacArthur & Graham, 2016; Zimmerman & Risemberg, 1997), it remains difficult to see this relationship emerge in interventions conducted with students, especially in the classroom context, in a two-month span. In our study, we found the effects on self-efficacy to be weak for both experimental groups compared to the Control group. However, both experimental groups had small gains in self-efficacy between T1 and T2 (Cohen's d = .43 for EWI+PF and .30 for EWI) whereas the Control group did not (.07). Our study thus supports the positive effect of EWI on self-efficacy. Repeated practice of the same strategies in different tasks, always for the same type of text (opinion letter) but with increasing complexity, reinforced students' belief in their ability to succeed in writing.

Other research has not found similar effects. De Smedt and Van Keer (2018a) compared experimental groups using SRSD with and without peer assistance in a teacher-led intervention, and found the intervention to have no effect on self-efficacy with 5th and 6th grade students. In another study with a larger sample of students of the same age with more sustained peer assistance (De Smedt et al., 2020), they again found mixed results for self-efficacy. Only self-efficacy for ideation (planning and writing of ideas) showed a significant difference for the EWI+PA group compared to the EWI and Control groups. They found no significant difference in self-efficacy for conventions (using appropriate syntax, grammar and spelling) or self-efficacy for self-regulation (the capacity to regulate their writing). Even studies in which researchers intervene with students in subgroups have not found conclusive evidence regarding the effect of explicit instruction on self-efficacy (Graham et al., 2005). It remains to be seen under what conditions effective practices such as EWI and peer assistance can enhance self-efficacy.

10.5 Limits of Our Research Design

While our study shows that the explicit instruction intervention we implemented in classrooms with teachers did contribute to improving student outcomes, some limitations should be underscored. One limitation relates to the duration of our

intervention. It lasted six to eight weeks, depending on the number of sessions (two to three) that teachers conducted in a week. This duration is consistent with that used in several other studies (De Smedt & Van Keer, 2018a; De Smedt et al., 2020; Harris et al., 2012). However, others have implemented a shorter intervention window lasting approximately four to five weeks, with almost four hours weekly (McKeown et al., 2016), while others implemented longer ones: three months for Festas et al. (2015) and Rosário et al. (2019), and up to five months for Graham et al. (2005). The six to eight weeks that our intervention lasted is, in our opinion, the maximum amount of time we can practically impose on 5th grade teachers in Quebec, as they have a great deal of other content to cover during the school year. This duration was sufficient to observe the effects of explicit instruction on writing performance and self-efficacy, but insufficient for the peer feedback to produce meaningful results for writing outcomes or increase self-efficacy.

A second limitation relates to the absence of a more distal post-test intervention measurement. Some researchers (Prata et al., 2019, Festas et al., 2015 and Graham et al., 2005) used a second post-test a few months after the intervention to measure how skills were maintained after explicit strategy instruction. This research method greatly improves the generalizability of findings because any effects are no longer limited to the intervention setting. However, due to a lack of teacher availability, we were unable to implement this delayed post-test. After the six or eight weeks of intervention, the teachers had to teach other content in their 5th grade classes. We are therefore unable to comment on the maintenance of the effects we obtained with explicit instruction.

Another limitation relies on the self-efficacy questionnaire, which could have triggered students in both experimental groups to use the mentioned strategies during the post-test evaluation. We are not certain of this influence for 10-year-old students, but there is a possibility that completing the self-efficacy questionnaire could have activated the use of the strategies taught in both experimental groups.

11. Conclusion

Our study clearly shows the positive effect of our explicit writing instruction (EWI) intervention implemented in a French-speaking culture. Our results also have a high ecological validity, as all our EWI and peer feedback interventions were implemented by teachers. Thus, our results converge with studies that, for decades, have shown the effectiveness of EWI. It also shows that explicit instruction can be adapted to and usefully implemented in various cultures and that educational systems should consider this teaching method. Furthermore, EWI taught through PBPD not only shows effects on students' outcome, but also on teachers' professional development, providing them a valid framework for delivering effective writing instruction in their classroom (Gillespie Rouse & Kiuhara, 2017). However, we need to further examine the effect of peer feedback, how students

use it in class, what they are capable of in terms of peer feedback and what they specifically get out of it compared to the explicit strategy instruction. For this purpose, quantitative experimental designs are not sufficient. We need to conduct research using mixed-method sequential explanatory designs that will not only shed light on the relationship between variables under study but will also provide detailed explanations of how students use the tools taught and, above all, the benefits they get in terms of their learning and motivation.

Author's note

This research was made possible through funding from SSHRC's Insight Grants (#435-2019-0059).

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Appendix A

Student Characteristics

	Experimental group – peer feedback		Experimental group – individual		Control group	
Variables	n	%	n	%	n	%
Gender						
Girl	80	49.4	80	51.0	76	46.3
Boy	82	50.6	77	49.0	88	53.7
Total	162	100	157	100	164	100
Age						
9 – 10 years	108	66.7	132	84.1	145	88.4
11-13 years	54	33.3	25	15.9	19	11.6
Total	162	100	157	100	164	100
Home language						
French	143	88.3	130	88.8	140	85.4
English	4	2.5	1	.6	2	1.2
Other	15	9.3	26	16.6	22	13.4
Total	162	100	157	100	164	100

Appendix B

Self-Efficacy scale adapted from Bruning et al., 2013.

We used a Likert scale ranging from 0 (Not confident at all) to 100 (Absolutely confident).

IDEATION

1. I can think of many ideas for my writing.
2. I can put my ideas into writing.
3. I can think of many words to describe my ideas.
4. I can think of a lot of original ideas to write about.

REGULATION

5. I can concentrate for at least one hour when I write.
6. I don't get distracted while I write.
7. I can control myself when I write, even when it's difficult.
8. I can keep writing even when it's difficult.

VARIED TYPES OF SENTENCES

9. I can use interrogative sentences (questions) in my text to make my reader think.
10. I can use imperative sentences (orders, advice) to encourage my reader to act.
11. I can use exclamatory sentences (e.g.: What a great idea!) to encourage my reader to act.

READER'S AWARENESS

12. I can think about my reader, his/her ideas, his/her age, to convince him/her of my opinion.
13. I can speak directly to my reader to better convince him/her.

CONSISTENCY OF THE ARGUMENTATION

14. I can find convincing reasons (arguments) to support my opinion.
15. I can develop the reasons (arguments) that support my opinion, giving justifications.

STRUCTURE

16. I can write an introduction announcing my opinion and my reasons (arguments).
17. At the beginning of each paragraph, I can write a reason (argument) that supports my opinion and justify it correctly.
18. I can write a conclusion that restates my opinion and my reasons (arguments) in words different from those I've already used.

PEER FEEDBACK

19. I can offer another student clear comments and examples to help him/her improve his/her text.
20. I can suggest solutions to help another student improve his/her text.
21. I can ask students who comment on my text for clarification when I don't understand what they're saying.
22. I can pay attention to advice given to me by other students about my text.

Appendix C

Example of Detailed Indicators for the Criterion "Reader's awareness" According to the Ratings A-B-C-D-E

A (10/10):
The student takes the recipient into account throughout the text: they address the recipient several times at appropriate moments; they greet the recipient at the beginning and end of their text according to the formulas of the letter; we feel that they have thought about the characteristics of their recipient in order to write a text that is interesting for this person in particular. This is reflected, among other things, in the chosen arguments: the student has chosen relevant and convincing arguments, considering that their addressee is the school principal. As a rule, they are polite and respectful. If one puts oneself in the shoes of a school principal, one is fully satisfied with the proposed letter (in terms of taking the recipient into account).

B (8/10):
The student takes the recipient into account: they greet the recipient at the beginning and end of the text according to the formulas of the letter. They address the recipient at least once in the text in an appropriate manner. In general, we sense that the student has thought about the characteristics of the recipient in order to make the reading of the letter interesting. An argument may be less related to the concerns of a principal and more related to those of a 5th grader. Keep in mind that at this age, students are still very egocentric and have a hard time putting themselves in the shoes and head of someone else, especially someone older than they are with duties quite different from what they know as children. If we put ourselves in the shoes of a school principal, we are satisfied with the proposed letter (as far as taking the recipient into account).

C (6/10): The student takes minimal account of the recipient: they greet him at the beginning and/or end of the text, but may do so awkwardly (in some cases, he may omit one of the greetings). They may or may not address the recipient in the body of the text: in the majority of cases, we feel that it is "tacked on" and that the student has taken little account of the characteristics of the recipient to make the reading of their letter interesting. If we put ourselves in the shoes of a school principal, we are more or less satisfied with the proposed letter, something seems to be missing for us to be convinced (as to the consideration of the recipient).

D (3/10):

The student takes very little account of the recipient: they may greet the recipient at the beginning and end of their letter, but in an awkward manner. They never address the addressee in the body of the text in a judicious manner. One senses that they have given little thought to the characteristics of the recipient to make their text interesting. If we put ourselves in the shoes of a school principal, we are not satisfied with the proposed letter, it lacks several elements and interpellations for us to be convinced (as to the consideration of the recipient). We can also find clumsiness such as lack of respect which shows that the student did not take into account the status of their addressee.

E (0/10):
The student ignores or misidentifies the recipient (e.g., addresses parents, friends or teacher instead of principal); fails to greet the recipient at the beginning or end of the letter. Never addresses the recipient in the body of the letter. They do not take into account the characteristics of the recipient to find relevant and convincing arguments. If we put ourselves in the shoes of a school principal, we are not at all satisfied with the proposed letter: we feel that the student wrote the letter without taking into account that they had an addressee, namely the school principal.

Appendix D

Correlations Between the Correction Criteria

		2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
T1	1. Reader's Awareness	.32/.34/.29	.35/.53/.44	.45/.26/.36	.34/.27/.45	.28/.39/.26	.22/.24/.22	.25/.13/.10	.29/.23/.19	.03/.01/.10	.26/.32/.19	.23/.26/.26
	2. Progression of ideas	-	.49/.40/.43	.30/.40/.44	.47/.30/.40	.10/.20/.21	.21/.12/.15	.15/.20/.23	.29/.21/.28	.08/.21/.32	.34/.23/.38	.11/.14/.34
	3. Development of ideas		-	.38/.34/.46	.44/.38/.45	.29/.45/.27	.24/.29/.22	.22/.28/.08	.30/.29/.34	.07/.18/.24	.32/.34/.31	.26/.16/.29
	4. Structure and elements			-	.22/.22/.46	.15/.29/.17	.29/.26/.17	.34/.25/.09	.28/.26/.31	.30/.22/.10	.20/.34/.34	.20/.21/.36
	5. Vocabulary				-	.42/.43/.48	.19/.31/.22	.13/.20/.24	.31/.17/.32	-.01/ .26/.22	.42/.44/.36	.33/.18/.29
	6. Types of sentences					-	.01/.15/.02	.09/.10/ -.05	.20/.14/.19	-.05/.21/ -.05	.21/.14/.17	.15/.10/.24
T2	7. Reader's Awareness						-	.36/.37/.14	.45/.61/.31	.32/.46/.38	.52/.67/.29	.52/.59/.20
	8. Progression of ideas							-	.38/.47/.31	.37/.38/.38	.45/.46/.33	.22/.19/.14
	9. Development of ideas								-	.25/.38/.35	.56/.57/.31	.48/.42/.30
	10. Structure and elements									-	.20/.46/.27	.15/.31/.00
	11. Vocabulary										-	.46/.62/.39
	12. Types of sentences											-

Note. Correlations before the first slash are for the EWI+PF group, between the two slashes for the EWI group and after the second slash for the control group.

Specifically, Campbell and Fiske (1959) proposed the following guidelines to assess the construct validity of a multidimensional instrument: 1) convergent validity occurs when the correlation between scores of two different methods assessing the same construct is high and significant (see correlations in bold in Appendix D); 2) divergent validity occurs when correlations between scores of two constructs assessed by a different method are lower than convergent correlations (convergent correlations are in italic in Appendix D; 3) a method effect exists when correlations between constructs' scores of the same method are higher than convergent correlations (same method correlations are underlined in Appendix D); 4) the pattern of correlations among different constructs' scores should be similar for different methods. In sum, construct validity is supported when a) convergent correlations are high, b) divergent correlations are lower than convergent correlations, c) when the method effect is low, and d) when the pattern of correlations among different constructs is similar for different methods. Although it is impossible to present results in detail here regarding these four guidelines, most of them are respected except that there is a method effect because correlations among scores of the seven constructs of the same method (see underscored correlations in Appendix D) are sometimes higher than convergent correlations (see correlations in bold in Appendix D).

Appendix E

Effects of Covariates on Self-Efficacy, Assessment Criteria and Global Scores

	Parameter	p
Self-efficacy		
Age	-5.82	<.001
Gender	-4.56	<.001
Reader's awareness		
Age	-.30	.003
Gender	-.64	<.001
Consistency: Progression of ideas		
Age	-.13	.12
Gender	-.24	.001
Consistency: Development of ideas		
Age	-.07	.62
Gender	-.59	<.001
Structure and elements		
Age	-.37	.01
Gender	-.45	<.001
Vocabulary		
Age	-.17	.21
Gender	-.52	<.001
Use of various types of sentences		
Age	-.48	<.001
Gender	-.43	<.001
Global score		
Age	-2.09	.02
Gender	-3.51	<.001

[i] POW = Pick an idea or opinion; Organize and generate notes and ideas; Write and say more.

TREE = Topic sentence; reason; Explanation; Ending.

[ii] All French language materials available to teachers and their students are freely available online: https://www.strategieslectureecriture.com/groupe-exp%C3%A9rimental-collaboratif