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Application of a Written Composition and Reading Comprehension Program in Primary Education Students

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ABSTRACT

Introduction: In this report we present our research and a program whose purpose is improvement of written composition (WC) and prevention of learning disabilities in writing. This work is based on: a) the Hayes and Flower model (1980), in which three processes are distinguished: planning, translating and reviewing, b) the concept of writing as an interactive activity, resulting from the simultaneous, reciprocal activation of all the processes involved. The objective of this research is improvement in writing in fifth- and sixth-graders, through application of WC programs (and programs with both WC and Reading Comprehension (RC)).

Method: The sample was composed of 68 fifth- and sixth-grade primary students, between the ages of 10 and 12, who attend school at two locations in Malaga city (Spain). From this group, 37 were selected for application of the different experimental conditions. Instruments used to carry out the research include: “TALE” (Test of Reading/Writing Analysis), “ECL” (Evaluation of Reading Comprehension), the “Test for Evaluating Writing Processes in Primary Schoolchildren”, specific WC and Reading Comprehension tests.

Results: Results show that students who participated in the designed intervention programs significantly improved in WC (and RC).

Discussion: Hypotheses were confirmed, demonstrating suitability of the model chosen, as well as the effectiveness of instruction in WC (and RC) through specific programs based on explicit, direct teaching of basic WC strategies (and RC strategies).

Keywords: Written Composition, Reading Comprehension, Learning disabilities, Primary Education.

Introduction

Research in written composition and learning disabilities.

Writing is a skill which depends particularly on the writer's capacity for and interest in understanding the potential reader's point of view. In addition to knowledge about the reader, the writer must possess knowledge of the subject he intends to write about, knowledge of relevant language, and finally, knowledge of personal aspects involved in writing and how to control them. Models that explain writing have progressed considerably in the last twenty-five years.

- 1) At the beginning of the sixties, Rohman and Wlecke (1964), cfr. Camps 1990; García and Marbán, 2002, put forward one of the first models where Written Composition figured prominently. It is known as the *stage model* because they considered that writing was carried out in three successive stages: a) Pre-writing; b) Writing; c) Re-writing.
- 2) *Cognitive models* of written composition are more interested in the internal processes that the writer follows; thus, they are more concerned with the process than the final product. Emig (1971); Valle, (1992, 1994); Belinchón, Rivière and Igoa, (1992); Ellis and Young, (1992); Cuetos, (1991, 1993), among others, affirm that four modules intervene in the writing process: a planning module, syntactic module, lexical module and motor module; these in turn would address as many processes: planning, construction of the syntactic structure of the text, recovery of words and motor movements. The way in which modules and processes relate to each other has given rise to two different approaches: the so-called lineal, unidirectional approach, according to which each of the modules functions autonomously, and its activation would depend on the functioning of the preceding module. And the so-called interactive approach which conceives a simultaneous, reciprocal activation of all processes involved, such that they all influence each other throughout the writing activity (Emig, 1971; Flower and Hayes, 1981; Camps, 1990; Valle, 1992).

a) The Hayes and Flower model: Three writing processes are distinguished: Planning, translating and reviewing (Hayes and Flower, 1980; Flower and Hayes, 1981;

Hayes, 1996). Planning involves information for working out a plan to write the text, information which the writer must locate in his long-term memory (or in other sources, as the case may be). In planning one finds (or should find, depending on the writer) three sub-processes: Generating ideas, that is, recovering relevant information from memory; Organizing ideas, that is, selecting the most suitable information from that which was recovered in the previous sub-process, and structuring a writing plan; and establishing goals and sub-goals, that is, setting criteria to guide the realization of the writing plan. In 1994, Kellogg included a fourth sub-process: Evaluating the ideas, that is, checking whether what was planned and what has been done so far are fulfilling what was intended. The process of translating involves text production (putting words on paper) that is consistent with the established plan. The text produced should be legible, grammatical and formally correct. This process involves numerous lexical, syntactic, dextrous and other demands, requiring frequent revision and looking back over the original plan. Finally, reviewing means improving what has been written through sub-processes of: Rereading: allowing the writer to detect errors while writing; and Editing: which facilitates correcting errors and making the content suitable in terms of the rhetorical situation.

This model was reformulated by Hayes in 1996, incorporating processes and terms which differ in part from those proposed earlier: a reflection process (incorporating the planning process), which involves the activity that operates on an internal representation in order to produce another internal representation; a production process (incorporating that of translating), which starts from the internal representation and produces writing --or speech or graphics -- and an interpretation process (incorporating that of reviewing), which generates an internal representation from the linguistic entries, written or spoken, and graphics. Hayes insists on the importance of working memory for the elaboration of representations, including visual and spatial aspects (such as tables, graphics, charts, drawings). Likewise, he emphasizes the importance of motivation in the writing process, and also social factors surrounding the writer, the reader, and the act of writing itself.

b) ***Two models of composition processes***: two different models were proposed for explaining two different circumstances in writing: (a) the case where the writer tells what he knows about the topic in question, the "knowledge-telling model" or "model of telling what one knows" (García and Marbán, 2002), and (b) the case where, in addition to telling, the

writer transforms his knowledge about the subject, the "knowledge-transforming model". This stems from the concept of written composition as a problem to be solved; to this end, as in the previous case, it is also based on a mental representation of the task, but before getting down to work, an action plan is developed which addresses two problems to be solved: what to write and how to write it. Perhaps the most notable characteristic of this model is that, besides text construction, the writer reconstructs his knowledge in a more personal and significant way than how it was before, thus fulfilling the epistemic function of written language that Bereiter and Scardamalia recommend (1987).

Research on **planning** reveals the following basic facts: one, applicable to everyone, is that we produce written text much more slowly than what natural limits allow, due to the time we use in planning; and two, people with learning disabilities in written composition do not plan, or at least do not do so early enough.

According to Hayes and Flower, the process of **translating** means transfer of what has been planned onto paper. Planning and producing are two activities that occur interactively. Research on translating has brought to light certain questions of special interest: Read (1981), Scardamalia (1981), Mayer (1999) emphasize that if low level writing skills are not acquired adequately and have not been automated, they require many cognitive resources, to the detriment of richness in content. Lacking mechanical skills, the transfer of ideas onto paper can affect the student's flow of thought, since processing capacity is limited, and more so in young writers and/or those with learning disabilities in writing. In other words, lower level processes interfere with higher level ones.

A second question of interest is whether there are individual differences in translating. Different authors (Flower, 1979 (quoted in Mayer, 1999); Bereiter, 1980; Scardamalia *et al.*, 1982; Scardamalia and Bereiter, 1985, 1986; Mayer, 1999), have shown that differences exist in both the length of texts and in their richness of expression, between younger students and those with writing problems, and students in higher grades and without problems. They also find another especially interesting fact: when there is less richness of expression, the writer expresses his ideas in linear fashion, that is, writing them one after another, just as they appear in his mind (what Bereiter calls "*associative writing*"). Meanwhile, when richness of expression is greater, the writer expresses his points of view, proposes coherent solutions, mixes different ideas at the same time, and analyzes some of them in terms of the others.

The text **reviewing** process, according to Bartlett (1982), comprises two sub-processes: error detection and correction of errors. Butler, Elaschuk and Pool (2000) find that good writers carry out self-regulated writing, relying on their knowledge of the task and of its possibilities, they use helpful strategies, they are sure of their ability to produce significant texts, and they believe that the successfulness of writing is under their control. In contrast, writers with learning disabilities in written composition show difficulties in these aspects, especially in awareness of self-efficacy and in how they attribute their successes and failures in writing.

On different occasions since the mid-1980s, different authors have been noting the contribution of so-called "executive control" or "executive function" in written composition tasks, where higher level processes are involved (Scardamalia and Bereiter, 1985, 1986; Graham, 1990, 1997; Graham, Schwartz and MacArthur, 1993; De la Paz, Swanson and Graham, 1998, among others). In 1986, Scardamalia and Bereiter reviewed the role of executive control in writing by children with learning disabilities in learning written composition, and they arrive at the following conclusion: the children use written composition processes when their teachers provide executive control supports for that purpose; and that in general the written composition processes that they apply can significantly improve if they receive training in control coordination of the procedures involved. Graham (1983, 1985), when studying children with learning disabilities in writing, demonstrated that these children's problems in written composition are more acute because they have problems with self-regulating their writing and with elaborating strategies to organize their writing behavior. In order to confirm this he applied the program "*Compare, Diagnose and Operate*" (CDO) (Scardamalia and Bereiter, 1985) to 12- and 13-year-old children with learning disabilities in written composition. The results showed that using a program of executive routines, such as CDO, improved performance in students with written composition learning disabilities in their reviewing tasks. De la Paz, Swanson and Graham (1998) carried out a replica of Graham's research (1985), from the hypothesis that using a program like CDO would improve written composition in students with written composition learning disabilities since it would help them carry out functions of executive control. Results amply confirmed expectations: executive control not only made reviewing tasks easier, but had positive effects on the quality of the written text. Finally, they indicate that a fundamental goal in the teaching of writing, in particular to students with learning disabilities, should be that students learn skills and strategies needed for improving their written composition. In LD students, this is attained

with direct, explicit training in executive control during writing.

In summary, this report presents our research and a program whose purpose is improvement of written composition (WC) and prevention of LD in writing this, based on the following:

a) The Hayes and Flower model, where three processes are distinguished: planning, translating and reviewing (Hayes and Flower, 1980; Flower and Hayes, 1981; Hayes, 1996). This is a classic model in research on WC, which as we commented earlier, has empirical support to confirm its proposals, and which can with relative simplicity be suited to classroom work.

b) The concept of writing as an interactive activity, resulting from the simultaneous, reciprocal activation of all the processes involved, such that they all influence each other throughout the writing activity (Emig, 1971; Flower and Hayes, 1981; Camps, 1990; Valle, 1992; among others).

Research objectives

1) *General Objective:* Writing improvement in fifth- and sixth-grade primary students, through application of Written Composition (WC) programs.

2) Specific Objectives:

- WC improvement in fifth- and sixth-grade primary students, through application of programs that address the learning and appropriate use of basic writing processes of Planning, Translating and Reviewing.
- WC improvement in fifth- and sixth-grade primary students, through application of programs that address the learning and appropriate use of basic writing processes of Planning, Translating and Reviewing, and application of Reading Comprehension (RC) programs based on utilization of basic strategies of Selection and Organization of relevant information from the text.

Hypotheses

1) We expect that the application of programs that teach writing strategies of Planning, Translating and Reviewing would improve WC in the students, in all experimental

conditions, whether only the WC program were applied, or whether it were complemented with the RC program.

2) We expect that the application of programs that teach strategies of Selection and Organization of relevant information would improve RC results in the students, in all experimental conditions.

3) We expect that the application of programs that teach writing strategies of Planning, Translating and Reviewing, and reading strategies of Selection and Organization of relevant information, would improve WC results to a greater extent than that shown in students who only received instruction in WC strategies, since it is thought that RC improvement enhances the learning of WC.

4) We expect that the application of programs that teach writing strategies of Planning, Translating and Reviewing would improve students' WC results to a greater extent than that shown in students who do not receive instruction in WC strategies, but follow the normal course of learning written composition as programmed by the teachers in their Classroom Curriculum Design.

Method

Subjects

68 students from fifth and sixth grades of Primary School participated, from both sexes, between the ages of 10 and 12, and who attend school at two locations in Malaga city; 37 of these were selected for application of the different experimental conditions.

Design

We applied a Pretest-Posttest design, in which the different groups were compared before and after the intervention. In order to better understand and assess the extent of results, three different experimental conditions were introduced: (i) WC program, (ii) WC+RC program, (iii) application of both types of programs in a small group, separated from the rest of the classroom.

Variables

a) Subject-related:

- Planning, Translating and Reviewing processes involved in Written Composition.
- Sub-processes of Generating, Evaluating, Organizing (Planning), Rereading and Editing (Reviewing).
- Written Composition strategies of goal setting, activation of prior knowledge, selection and organization of relevant ideas.
- Reading Comprehension strategies of selection and organization of relevant ideas.

b) Instruction-related: Instruction in a small group, separated from the rest of the classroom.

c) Dependent:

- Writing (Written composition measured in terms of: initial questions, letter format, composition structure, number of sentences, number of words, vocabulary-adjectives, vocabulary-adverbs, punctuation marks).
- Reading comprehension (measured in terms of: short-term memory, vocabulary, main idea, summary-ideas, summary-order).

Instruments

a) Evaluation for selection of the research group:

- .Test of Reading/Writing Analysis: TALE (Toro and Cervera, 1990).
- .Evaluation of Reading Comprehension: ECL (De la Cruz, 1997).
- ."Test for Evaluating Writing Processes in Primary schoolchildren" (Cuetos, Sánchez and Ramos, 1996).

Once the students who would form part of the different experimental groups were selected, specific tests of WC and RC were applied to them, identical to intervention conditions.

b) For the WC intervention: we developed and applied a WC program based on instruction in the writing processes of Planning, Translating and Reviewing. Students were to follow a sequence of self-instructions, applying them to each of the different texts they were to write.

c) *For the RC intervention:* we developed and applied a RC program based on instruction in processes and strategies of Sustained Attention, Prior Knowledge, Selection and Organization of relevant information. Students were to follow a sequence of self-instructions, applying them to each of the different texts they were to read.

d) *For both the WC and WC/RC interventions:* Reading Book: “*Aventuras de Tito Paco*” [*Adventures of Uncle Paco*] by A. Gómez Yebra (2001). Zaragoza: Edelvives.

Procedure

1st Phase: Evaluation and Group Formation:

The 68 students who initially composed the research group were evaluated in RC by tests TALE and ECL, and in WC by tests TALE (syntax and written comprehension) and Cuetos *et al.* (free and guided WC). The programs were applied to 37 students, while not to the remainder (31).

-Group 1 (application of the WC Program in a small group): formed by 19 students in fifth and sixth grades, from among the 68 initial participants, including those whose direct scores were above average, average, and below average in WC tests, so that the group would be balanced.

-Group 2 (application of the WC and RC programs in a small group): formed by 18 students in fifth and sixth grades, from among the 68 initial participants, including those whose direct scores were above average, average, and below average in WC tests, so that the group would be balanced.

-Group 3 (control group): formed by 14 students from 5th grade and 17 students from 6th grade, from among the 68 initial participants.

In order to form the groups, scores obtained in RC were taken into account as a complement to the WC scores, such that we sought to include students who had also obtained scores above average, average, and below average in RC. Once the groups were formed, the students (37) were evaluated again using specific WC and RC tests, with similar content to what would be worked on during the intervention.

2nd Phase: Development of the Written Composition and Reading Comprehension Programs

We developed the following *ex profeso* in order to carry out this study.

A) Written Composition Program:

General structure of the program

- a) Self-instructions; b) Presentation of the topic to be written about.
- Planning: c) Prior knowledge about the topic; d) Thinking about who will be addressed (knowledge about the reader); e) Thinking about what you want to accomplish (goals); f) Sub-process 1: General ideas; g) Sub-process 2: Evaluating ideas in terms of d and c; h) Sub-process 3: Organizing ideas in terms of d and c.
- Translating: i) Writing the text
- Reviewing: j) Reviewing what has been written in terms of what was planned, and evaluating it; k) Control and self-regulation of the composition.

Phases *a* through *e* and *k* will be worked on during every session, the others will be added gradually. In all cases, *i* and *j* must also be worked on. These are the steps followed:

STEP 1: work on *a* through *e* and *k*; STEP 2: work on *f*; STEP 3: work on *g*; STEP 4: work on *h*; STEP 5: work on everything.

Content: Students are asked to write about the following topics: 1-Letter to a friend, open topic (evaluation); 2-Composition about a film that they liked very much, addressed to a friend; 3- Composition about a game they know well; 4-Composition about an outing to the country; 5-Essay on how to organize a birthday party at home; 6-Letter to a friend explaining what the city of Malaga is like; 7-Essay describing their neighborhood, addressed to the mayor; 8-Description of one's pet or one's desired pet; 9-Essay on the need for farm shelters that keep abandoned animals; 10-Essay on selective garbage collection; 11-Describe the TV program "Operación Triunfo"; 12-Description of what they would do on a deserted island; 13-Description of the profession they would like to practice; 14-Letter to a friend, open topic (new evaluation).

Text formats to be used correspond to simple structures: description, listing, development of a concept, solution to a problem, cause-effect. One begins with an organizing

sentence (main idea, problem, cause) and continues by developing the rest (properties, steps, arguments or examples, effects).

B) Reading Comprehension Program

General structure of the program

- Self-instructions.
- First reading of the text: a) Sustained attention; b) Short-term memory.
- Second reading of the text: c) Prior knowledge; d) Vocabulary; e) Search for and select the main idea; f) Organize information; g) Control and self-regulation of comprehension.
- Steps to be followed were as follows:
 - STEP 1: *a, b, c, g*;
 - STEP 2: The same as above, plus selecting the Main Idea, steps: *a, b, c, d, e, g*;
 - STEP 3: The same as above, plus they must Organize ideas, steps: *a, b, c, d, e, f, g*.

Content: The program is performed using selected texts from the student's reading books. Just as in WC, text formats to be used correspond to simple structures -- description, listing, development of a concept, solution to a problem, cause-effect -- beginning with an organizing sentence (main idea, problem, cause) and continuing by developing the rest (properties, steps, arguments or examples, effects).

Third Phase: Application of programs

Instructional model of application: Thinking Guides for WC and RC, with activities for students to complete, are developed following a framework of self-instructions that guide the students' reflexion process and action. The intention is that students will so internalize the self-instructions that they apply them in their WC and RC tasks outside of the program. The monitors will initially use a direct instruction model, at the same time trying to encourage the students' constructive activity. Toward this end the monitors' involvement will decrease over time as the students acquire basic program procedures and have practiced them.

1) WC Program

Sessions: the program consists of 15 sessions, thirteen for the intervention, and two for evaluation. Two work sessions per week were carried out during the months of February to April, 2002.

Structure and duration of each session: Each session lasted from 50-60 minutes, distributed as follows: 5-10 minutes for discussing the reading (reading book) and for re-reading the self-instruction sheet, 20-25 minutes for planning tasks, about 20 minutes for the translating, about 10 minutes for reviewing.

For each session a Thinking Guide on WC was developed; students were to complete them and the corresponding Teacher Worksheets on WC.

2) RC Program

Sessions: the program was carried out in 13 sessions, of which 11 sessions were dedicated to program application and the remaining two to evaluation. The two weekly sessions were interwoven with the corresponding sessions from the WC program, since the WC and RC programs were applied jointly. The total number of sessions was 24, plus two additional evaluation sessions at the beginning and end of the program. The sessions took place during the months of February to June, 2002.

Structure and length of each session: Sessions lasted for about 60 minutes, distributed roughly as follows: evaluating work done at home (5 minutes), reading the text (5-8 minutes) short-term memory questions (5 minutes), prior knowledge questions (5 minutes), re-reading the text (5-8 minutes), selecting the main idea (10 minutes), organizing selected ideas (10-15 minutes), metacomprehension (5-10 minutes).

For each session a Thinking Guide on RC was developed; students were to complete them and the corresponding Teacher Worksheets on RC.

Fourth Phase: New evaluation of all participating students.

Fifth Phase: Results analysis.

Results

Verifying assumptions of Normality and Homogeneity

After verifying assumptions of Normality and Homogeneity in the distribution of subjects' scores, from which we selected students for program application, results showed that requirements for normality and homogeneity are met for the RC variable, fulfilling the null

hypothesis. However, conditions of normality are not met for the WC variable, but results obtained with “t” and F tests show that the requirement of a null hypothesis of equality between averages is fulfilled.

Verifying Pre and Post-Intervention Differences

1. *WC Variable (first hypothesis).* In order to verify differences between the groups before and after intervention, we used “t” tests for related samples and F tests of contrast of averages for related samples.

Table 1. “t” test for related samples

| | | Related differences | | t | gl | Sig. (bilateral) |
|-------------------|------------------------|---------------------|----------|-----------------|--------|------------------|
| | | Average | St. Dev. | | | |
| Pair 1 | Initial questions | -.6667 | .7237 | -3.568 | 14 | .003 |
| Pair 2 | Letter Format | -.4667 | .5022 | -8.047 | 74 | .000 |
| Pair 3 | Composition structure | -.6400 | .9535 | -5.813 | 74 | .000 |
| Pair 4 | Number of sentences | -7.0667 | 8.7770 | -6.973 | 74 | .000 |
| Pair 5 | Number of words | -39.8667 | 58.9208 | -5.860 | 74 | .000 |
| Pair 6 | Vocabulary: adjectives | -2.0000 | 3.4090 | -5.081 | 74 | .000 |
| Pair 7 | Vocabulary: adverbs | -1.7867 | 3.6291 | -4.264 | 74 | .000 |
| Pair 8 | Punctuation marks | -.6133 | 1.0892 | -4.877 | 74 | .000 |
| ANOVA | | Sum of squares | gl | Squared average | F | Sig. |
| Initial questions | Between groups | 3.556 | 1 | 3.556 | 10.765 | .001 |
| | Within groups | 29.067 | 88 | .330 | | |
| | Total | 32.622 | 89 | | | |
| Punctuation marks | Between groups | 14.107 | 1 | 14.107 | 15.565 | .000 |
| | Within groups | 134.133 | 148 | .906 | | |
| | Total | 148.240 | 149 | | | |

Results show that in the eight subvariables making up WC, differences are significant with respect to intervention times (before and after), thereby verifying the effectiveness of the WC Program which was applied.

2. *RC Variable (second hypothesis)*. In order to verify differences between the groups before and after the intervention, we used F tests of contrast of averages for related samples and Mann-Whitney U and Wilcoxon W non-parametric tests.

Results show that in the five sub-variables which make up RC (Short-term Memory, Vocabulary, Main Idea, Summary-Ideas and Summary-Order), differences are significant with respect to intervention times (before and after), thereby verifying the effectiveness of the RC Program which was applied.

Table 2. ANOVA

| | | Sum of squares | gl | Squared average | F | Sig. |
|------------------------------------|----------------|-------------------|----|-----------------|---------------|------|
| Vocabulary | Between groups | 13.779 | 1 | 13.779 | 4.527 | .036 |
| | Within groups | 258.704 | 85 | 3.044 | | |
| | Total | 272.483 | 86 | | | |
| Summary-ideas | Between groups | 36.556 | 1 | 36.556 | 27.704 | .000 |
| | Within groups | 112.157 | 85 | 1.319 | | |
| | Total | 148.713 | 86 | | | |
| Non-parametric contrast statistics | | Short-term Memory | | Main idea | Summary-order | |
| Mann-Whitney U | | 423.000 | | 308.500 | 359.000 | |
| Wilcoxon W | | 1413.000 | | 1298.500 | 1349.000 | |
| Z | | -4.649 | | -5.821 | -5.710 | |
| Asymptot. Sig. (bilateral) | | .000 | | .000 | .000 | |

3. *Verification of differences with respect to Time and Program (hypothesis 3)*. One of the more interesting hypotheses was whether the joint application of WC and RC Programs would benefit WC results, as seems reasonable to expect *a priori*. For this purpose the F test was used. The sub-variable “initial questions” was not taken into account since it was not possible for all the participants to respond. Of the seven remaining sub-variables, different results were obtained in the pre-intervention evaluation for both groups: in four cases the results were better for the group where the WC program would be applied; in one case --letter format-- the group assigned to the WC+RC Program had better results initially, and finally, in the two remaining cases, both groups had similar results. Despite these initial differences,

which would lead us to predict better post-intervention results for the WC-only group, it was not so, or at least not for all variables. As can be seen in summary-chart 1, after the intervention, the WC+RC group obtained the best results in four of the seven sub-variables (number of adverbs, number of words, number of sentences and letter format). Thus the hypothesis formulated was partly fulfilled.

4. *Verification of differences with respect to the Control Group (hypothesis 4).* Results show that after the intervention, students who followed the normal program established by the School Plan for teaching WC obtained significantly lower scores than students who participated in the Intervention Program, thereby confirming hypothesis 5.

Table 3

| | | letter format | composition structure | vocabulary-adjectives | punctuation marks | | |
|----------------------------|----------------|----------------|-----------------------|-----------------------|-------------------|--------|------|
| Mann-Whitney U | | 795.000 | 444.000 | 259.500 | 881.500 | | |
| Sig. asymptot. (bilateral) | | .000 | .000 | .000 | .020 | | |
| | | Sum of squares | | gl | Squared Average | F | Sig. |
| number of sentences | Between groups | 1516.669 | | 1 | 1516.669 | 30.526 | .000 |
| | Within groups | 5415.565 | | 109 | 49.684 | | |
| | Total | 6932.234 | | 110 | | | |
| number of words | Between groups | 62969.882 | | 1 | 62969.882 | 25.708 | .000 |
| | Within groups | 266988.010 | | 109 | 2449.431 | | |
| | Total | 329957.892 | | 110 | | | |
| Vocabulary-adverbs | Between groups | 56.999 | | 1 | 56.999 | 5.183 | .025 |
| | Within groups | 1198.695 | | 109 | 10.997 | | |
| | Total | 1255.694 | | 110 | | | |

5. *Verification of differences with respect to Time and Grade in School; to Time and Gender; and analysis of results obtained by students with lower scores.* Exploratory results, not predicted as hypotheses, show that:

In general, the intervention does not differ significantly with regard to student's grade in school (5th or 6th), although one observes a greater benefit in 5th graders in all variables except in vocabulary-adjectives. Likewise, as one would expect, the intervention does not allow differentiation according to gender.

Finally, analysis of post-intervention results for students who scored lowest at pre-intervention, as well as for those who scored highest, indicate that the “lowest” improved more than the “highest”, as could be expected from WC research performed with LD persons. Nonetheless, it is also true that among the "lowest" group, there were students who made practically no improvement, leading us to think that the program should be further adapted to their base knowledge and strategies.

Discussion and conclusions

Since the first and fourth hypotheses were confirmed, we claim that the model chosen was suitable, and that instruction in Written Composition, through a specific program based on explicit, direct teaching of basic strategies of planning, translating and reviewing (per the classic model of Hayes and Flower), was indeed effective.

If, in addition, the WC Program is accompanied by direct, explicit teaching of basic Reading comprehension strategies (Prior knowledge, selection and organization of information, self-regulation in comprehension), results in written composition are increased (confirmation of hypotheses 2 and 3). This corroborates the idea that in the learning of written language, composition and comprehension are not separate aspects that develop and function independently (that is, being skilled in RC enhances written composition and viceversa).

One of our biggest concerns, along the line of results, is to verify the duration of learnings and their application to other writing situations. It could be expected that the length of the programs, not being extensive, would not have a permanent effect if guidelines for follow-up were not established, in the same way that generalization of strategies is also subject to more continued practice. In the Research Project of which this Report is the first part, these aspects will be considered.

Finally, we form the following conclusions, in consideration of research results:

1) Explicit teaching of WC (and of RC), through specific programs that favor development of cognitive and metacognitive processes and strategies for composition and comprehension, should be present in greater intensity and depth as an objective in the curriculum design for teaching writing and reading in Primary Education. This is especially true in the fifth and sixth grades, forerunners to higher educational levels where Writing, and especially Written Composition, no longer receive as much attention. If the content is significant and well-suited to the pupils, and methods are given enough interest and time, students learn in optimal conditions, even those who show Learning Disabilities.

2) It is beneficial to incorporate into the School Plan the application of similar programs to those developed here. This would involve, in addition to adapting objectives, content, etc., improvement in teacher training and motivation, beginning with the conviction that better mastery of reading and writing in the phase of Primary Education should be a fundamental, priority objective.

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