

Metacognitive strategies applied to writing as predictors of spontaneous writing quality

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Abstract

Introduction Writing is a tool for constructing and modifying knowledge. However, it is not easy to evaluate spontaneous writing tasks. In the present study, we selected and analysed a series of quality indicators to assess spontaneous or productive writing, examining the level of difficulty of the indicators and the relationship between the application of metacognitive strategies when writing and the quality of spontaneous writing products.

Method Participants consisted of 480 Spanish students in their 5th and 6th years of primary education and 1st and 2nd years compulsory secondary education (40% females and 60% males). Several tests were administered: a PROESC subtest, EVAPROMES and story writing. In addition, we collected the marks obtained in the previous year for the subject of Spanish language.

Results Spontaneous writing product quality was related to academic achievement in Spanish language, and metacognition, as measured by EVAPROMES, was the underlying variable that explained differences in the difficulty of the quality indicators.

Discussion and conclusions The differences observed in an analysis of indicators by educational level (primary vs compulsory secondary education) appeared to be due to the methodology employed by teachers in class and the standards required. Implementing spontaneous writing tasks that involve the application of metacognitive strategies (meta-writing) would exert a positive impact on students' academic performance.

Key words: Metacognitive strategies, spontaneous writing, quality indicators, assessment of meta-writing.

Resumen

Introducción. La escritura es una herramienta que construye y modifica el conocimiento. Evaluar la tarea escritora espontánea no es tarea fácil. En este trabajo se han seleccionado y analizado una serie de indicadores de calidad para la evaluación de la escritura espontánea o productiva y se ha analizado su nivel de dificultad así como la relación que existe entre la aplicación de estrategias metacognitivas al escribir y la calidad en el escrito espontáneo.

Método. Los participantes en esta investigación fueron 480 estudiantes de 5º y 6º de Educación Primaria y 1º y 2º de Educación Secundaria Obligatoria (40% mujeres y 60% hombres). Se administraron varias pruebas: una subprueba de PROESC, EVAPROMES y la escritura de una historia. Se recogieron, además, las calificaciones de la asignatura de Lengua Española del curso anterior.

Resultados. La calidad de los escritos producidos de forma espontánea se relaciona con el rendimiento académico en Lengua Española, siendo la metacognición, medida mediante EVAPROMES, la variable subyacente que explica las diferencias en dificultad de los indicadores de calidad.

Discusión y conclusiones. Las diferencias observadas en el análisis de los indicadores por etapas (Educación Primaria vs Educación Secundaria Obligatoria) parecen ser debidas a la metodología que los docentes emplean en las aulas así como al nivel de exigencia demandado. Por otro lado, implementar tareas de escritura espontánea que exijan la aplicación de estrategias metacognitivas (metaescritura) redundaría positivamente en el rendimiento académico de los alumnos.

Palabras Clave: estrategias metacognitivas, escritura espontánea, indicadores de calidad, evaluación de la metaescritura.

Introduction

Ensuring that students learn to produce effective, quality writing is one of the main challenges facing the education system. Improving this skill has become a priority for several reasons: poor performance in objective classroom tasks and tests; difficulties observed by teachers; external examinations carried out in each Autonomous Community in Spain; various studies that have reported a lack of clarity in the curricula (Castelló, 2007, 2009; Condemarín & Chadwick, 1990; Consejería de Navarra, 2006-2007; Informe Europeo, 2002; Quintero & Hernández, 2001; Sánchez, 2006; UNESCO, 1990) or the difficulties entailed in assessing writing properly (Albarrán, 2009; Cassany, 2000; Fabregat, 2009; Miras, Solé & Castells, 2000; Morales, 2004; Morles, 2003; Solé, 2001; Solé, Miras & Castells, 2000); the levels students are expected to attain as they progress through the education system; and the requirements of Spanish legislation (Organic Law of Improvement of Educational Quality: Spanish initials LOMCE) establishing what students must know and apply in order to demonstrate that they possess satisfactory linguistic and communicative skills.

Writing is not only a tool for transmitting information, but is also a key competence for constructing and/or modifying knowledge (Villalón & Mateos, 2009). It is a very complex task and is considered the tool which activates the cognitive processes that form our knowledge of the world, of others and of ourselves, and facilitates the acquisition of all kinds of learning throughout life (LOMCE, 2013). In school, writing forms part of practically all subjects, but is most specifically assessed in the subject of Spanish language. Students in their final years of primary education (10-12 years old) should be able to write narrative texts of a suitable length that evidence coherence and cohesion, correct morphosyntactic structure and a wide, appropriate vocabulary.

Productive vs reproductive writing

Writing can be classified in many different ways, but in line with Cuetos (2004), the present study focused solely on productive writing, which involves the expression of ideas, thoughts and knowledge, generally in spontaneous form. Conversely, reproductive writing involves tasks such as taking dictation, making a copy or even completing a questionnaire. The processes involved in productive writing are: a) planning the message, i.e. developing a plan of action; b) constructing syntactic structures; c) seeking lexical elements, which includes knowledge of phoneme-grapheme conversion rules, although natural, arbitrary spelling

must also be considered; and d) motor processes, i.e. fine motor skills and eye-hand coordination.

In contrast, only two of the above are involved in reproductive writing: motor processes and lexical processes. Spontaneous productive writing requires the application of specific strategies to produce quality texts. This can or does entail the use of higher-order strategies, such as metacognitive strategies; planning, producing and revising the composition.

Quality indicators in spontaneous writing

Based on current Spanish law (LOMCE) and following an exhaustive review of the literature in this field (Albarrán, 2009; Bañales & Vega, 2010; Barella, 2015; Camps, 1993; Cassany, 1995; Cuetos, 2004; Cuetos, Ramos & Ruano, 2004; Fabregat, 2009; Flower & Hayes, 1980; Morales, 2004; Morles, 2003; Scardamalia & Beriter, 1992; Solé, 2001; UNESCO, 1990), we selected the following writing quality indicators, varying the standard required for each indicator according to educational level (primary vs secondary):

- Title: this indicator is used to determine whether the writer has provided information on the subject of the text composed. It refers to whether the composition has a title, if this is related to the written text, if it is informative and how long it is, measured as the number of words it contains.
- Structure: this refers to organisation of the elements selected to write the text, and clear differentiation of the parts that comprise it.
- Coherence: this refers to the connection between the initial theme and sub-themes, with clear, cohesive ideas linked by connectors, a linear narrative structure and a logical outcome of the composition.
- Grammar: this is the aspect of linguistics that concerns the components of a language. This indicator explains the way in which the elements of a language combine to form texts and analyses the combinations of these units. It assesses the vocabulary employed and whether or not parts of speech are used.
- Stylistic resources: also known as figures of speech, these comprise non-habitual ways of using words. They are used to convey a non-literal meaning or to create particular effects with language. In poetry, they are used to engage the reader's attention.
- Morphosyntax: this is considered the part of grammar that encompasses both morphology and syntax. This indicator examines the overall sense of a sentence according to the different elements it contains and the various rules that govern a language. It assesses whether the sen-

tences forming a text are clearly differentiated with punctuation, if well-interrelated compound clauses are used and if there is agreement between subject and predicate in the sentences.

- Spelling: this refers to the rules that govern the written word, i.e. the correct use of letters and punctuation. This indicator assesses whether punctuation and accents are used correctly and if there are any spelling mistakes.

- Creativity: this category is considered the most subjective and difficult to assess and define. Creativity implies activating the imagination, and is also understood as applied imagination or the process of having valuable new ideas (Robinson, 2012).

Writing as a process

These days, writing is not considered a finished product but rather a process or series of processes (Miras, 2000). Writing as a process has been explained by various cognitive models (Alamargot & Chanquoy, 2001; Flower & Hayes, 1980; Kellogg, 1996, 1999; Scardamalia & Bereiter, 1992) which place emphasis on the cognitive operations that occur when writing: planning (defining the purpose of the text, considering the reader), production (selecting text type, coherence and cohesion of the writing, spelling, etc.) and revision (from the early stages of note-taking to the final version of the text. This involves rewriting to self-correct errors in the text). These stages of writing are fundamental to understand the modern approach to writing: meta-writing, or being aware of the stages involved in writing (Jiménez, Ulate, Alvarado & Puente, 2015). Writing is a means not only to convey information but also to construct and revise one's own knowledge (Solé, Miras & Castells, 2000), leading to self-regulation. Written composition is a challenge for the writer, who must activate complex problem-solving processes when planning, when considering the target audience, when organising the content and when revising the form and ideas of the text (Mourad, 2009).

Meta-writing

Metacognition can be defined as the knowledge people possess about their own thought processes and products (Flavell, 1976). The term refers to two basic components: knowledge about thought, which involves the individual's ability to reflect on his or her own thoughts; and regulation of that thought, which involves using strategies to regulate knowledge (Ulate, Jiménez, Alvarado & Puente, 2015). This is considered one of the most important constructs to achieve good academic performance.

Cognitive processes and skills can be transformed into metacognitive ones if appropriate strategies are applied. One such skill is writing, and the outcome would therefore be meta-writing. Meta-writing can be defined as the process by which a writer is aware of what and how he or she writes, and knows how to correct errors using metacognitive strategies (Jiménez *et al.*, 2015).

In line with Flower and Hayes (1980), meta-writing involves three metacognitive processes:

- a) Text planning. Deciding what to write about and how, and identifying the target audience. This process entails defining the goal of the text bearing in mind the potential audience, activating prior knowledge of the subject to write about and structuring the information to convey.
- b) Production or writing. This process involves starting to write while monitoring the text produced in order to detect and rectify difficulties and/or errors, ensuring that the text is accurate, consistent and cohesive, that the type of language used is appropriate (bearing in mind the target audience) and that the text is progressing in the right direction to achieve the objective or objectives established in the planning process.
- c) Revision. The quality and structure of the text is analysed, considering whether the initial objective has been achieved. The difficulties that arose and the strategies deployed to rectify them are also analysed, and any morphosyntactic, semantic, lexical and spelling errors are corrected.

The three processes occur simultaneously throughout the writing task. The goal is to deploy written composition regulation strategies and processes (Castelló, 2009; Castelló, Bañales & Vega, 2010; Graham & Harris, 2000; Zimmerman & Risemberg, 1997).

Assessing meta-writing is no easy task. Fidalgo and García (2009) have compiled the techniques and instruments used most frequently to assess metacognition in written composition, classifying them into two groups: offline methods (data obtained at times other than when the task is being executed), which include questionnaires, interviews, stimulated memory, teacher reports, calibration techniques and text analyses; and online methods (data obtained during execution of the task), which include thinking out loud, real-time tasks (double task, triple task, writing diary), observation, pause analysis and specific tests. None of

them is standardised and all can be contaminated by assessor subjectivity when analysing the data collected.

Ulate et al. (2015) have developed a test (EVAPROMES) to evaluate metacognitive processes in writing in children aged 9 to 14 years old, with the aim of determining the strategic areas of cognition and metacognition in the writing process, distinguishing good and bad writers and identifying the processes in which the latter fail in order to develop specific remedial education programmes. Studies carried out in Spain and Costa Rica have reported good reliability for the instrument (alpha coefficient = 0.85) and an excellent predictive validity for written composition quality ($R = 0.64$) (Jiménez *et al.*, 2015), confirming that it is important to master metacognitive strategies at school and that simply knowing the cognitive processes for writing is insufficient: it is also essential to internalise them so that they become part of self-regulation, “The use of self-regulation strategies such as planning, monitoring, seeking objectives and perseverance are essential for academic achievement in different school tasks” (Jiménez *et al.*, 2015, p. 651).

Objectives and hypothesis

Our main goal was to analyse the relationship between the quality of spontaneous writing and cognitive and metacognitive processes, in order to determine the predictive power of these variables regarding academic performance in the subject of Spanish language.

Since metacognition is a key element in explaining academic performance, we hypothesised that meta-writing, evaluated using EVAPROMES, would be a key variable in explaining the quality of spontaneous writing. Subjects with a better knowledge of meta-writing (knowledgeable about how to apply resources strategically) would produce higher quality written compositions. We expected that more skilled students with a greater knowledge of meta-writing would encounter no difficulties in using the more complex indicators of a quality spontaneous written composition.

Method

Participants

The study sample was recruited from schools in several autonomous communities: a public school in Andalusia, a private school in the Region of Valencia, two public schools in the Community of Madrid and a public school in the Basque Country. A total of 480 students

aged between 10 and 16 years old (mean 12.10, standard deviation 1.26) participated in the study. Of these, 146 (83 males and 63 females) were in their 5th and 6th years of primary education, and 334 students (190 males and 144 females) were attending compulsory secondary education. The mean age of the sample was 12 years and 10 months old, corresponding to the first year of compulsory secondary education. The sample included students who were repeating a year, had individual curricular adaptations (Spanish initials: ACI) or showed high intellectual capabilities, and was proportionally representative with regard to cultural, social and economic distribution.

Instruments

EVAPROMES. Evaluation of metacognitive processes in writing (Ulate *et al.*, 2015). This is a standardised, 28-item test that is administered collectively, although it can also be administered individually. It assesses the perception of writers and their writing skill in Spanish speakers aged between 9 and 14 years old and yields results on three metacognitive processes (planning, monitoring and evaluation). Validation studies have reported good reliability (alpha coefficient = 0.85) and strong evidence of construct validity in Spanish and Costa Rican samples (Jiménez *et al.*, 2015).

PROESC. Evaluation of writing processes test (Cuetos, Ramos & Ruano, 2002). This assesses the processes and aspects involved in the writing process in students from their 3rd year of primary education to their 4th year of compulsory secondary education (8-16 years old). It uses two types of tasks in the spontaneous writing section to determine if subjects have the capacity for planning: story writing and essay writing. These differ in terms of the structure and type of grammar they require. For the story writing component, students can choose between writing a well-known story or tale or a little-known one. If a student cannot think of one, a popular story can be suggested. For the essay writing component, students are asked to write about a well-known animal. If a student cannot think of one, animals such as lions or bears can be suggested. For the present study, we selected to use only the story writing component. The test assesses spelling proficiency (including accents and punctuation), proper use of capital letters and the ability to plan a narrative text.

Evaluation of text quality based on a spontaneous writing task. The written composition task is assessed using the eight quality indicators shown in Table 1, scored according

to 31 yes/no indicator items (for primary education, we included an additional item referring to the use or not of a full stop at the end of the text). Each yes/no item receives a score of 1 if the corresponding indicator has been used (yes) and a score of 0 if it has not (no). Test administration takes between 40 and 45 minutes.

Table 1. *Example of items used to assess writing quality*

<i>Indicator</i>	<i>Item</i>
Title	Is the title related to the content of the written composition?
Structure	Are the three parts of the narrative (introduction, plot and resolution) clearly differentiated?
Coherence	Are the events in the story narrated according to a linear structure (i.e. the narrative does not jump from one idea to another)?
Grammar	Have at least three examples of each part of speech been used (determiners, adjectives, adverbs, pronouns, nouns, verbs)?
Stylistic sources	re- Is at least one personification used (i.e. is an object or animal endowed with an exclusively human quality)?
Morphosyntax	Are sentences clearly separated by full stops and/or punctuation?
Spelling	Are the rules of accentuation applied as appropriate?
Creativity	Is reality mixed with fiction in the story?

Academic achievement in Spanish language. Since the study was conducted at the beginning of the school year, each student's final mark for Spanish language in the previous year was taken as the criterion variable.

Procedure

We administered the spontaneous writing test, indicating that the task was to write a story following a series of instructions which would help students contextualise it. The task was performed during the school day and participants were assured that it would not affect their academic results. They were also told that they had 30 minutes to perform the task, although no pressure was placed on students who needed a little more time to complete it. After that, we administered EVAPROMES. Each student was given a booklet of questions and told to read the instructions, look at examples of how to answer the questions and ask for clarification where necessary. Next, they were given the answer sheet and told that this was where

they had to enter their answers rather than in the booklet of questions. Then, we administered the PROESC story writing subtest. We also collected the marks obtained in the previous year for the subject of Spanish language, which were provided by each class tutor.

Data analysis

We conducted an analysis of correlations and an analysis of variance (ANOVA) using SPSS v.22.

Results

To determine the relationship between the text quality indicators and the other variables, we analysed the correlation between these and marks for the subject of Spanish language and scores for the PROESC and EVAPROMES tests. As can be seen in Table 2, the total score for the indicators and individual scores for each indicator showed statistically significant correlations ($p < .01$) with marks for Spanish language and scores for the PROESC subtest and EVAPROMES. In addition, the correlations between the scores for the PROESC subtest and EVAPROMES scale presented a similar strength to those for the total quality indicator score (see Table 2).

Table 2. *Correlations between quality indicators and marks for Spanish language and scores for PROESC and EVAPROMES*

	<i>LANGUAGE MARK</i>	<i>PROESC</i>	<i>EVAPROMES</i>
TITLE	.186**	.157**	.149**
STRUCTURE	.304**	.292**	.285**
COHERENCE	.244**	.244**	.278**
GRAMMAR	.274**	.247**	.279**
STYLISTIC RES.	.167**	.087	.167**
MORPHOSYNTAX	.286**	.257**	.269**
SPELLING	.352**	.276**	.294**
CREATIVITY	.264**	.136**	.150**
INDICATORS (TOTAL)	.344**	.307**	.317**

LANGUAGE MARK	1	.326**	.354**
PROESC	.326**	1	.252**
EVAPROMES	.354**	.252**	1

* $p < .05$, ** $p < .01$.

Most of the correlations in Table 2 exceeded the cut-off point of .20 established by Ferguson (2009) as the minimum size to consider since in practical terms, it represents a significant effect in social data; and even if Cohen (1992) is taken as the reference, it can be seen that the values were higher than the cut-off point of .30, indicating moderate effect sizes. Thus, the three assessment instruments correlated significantly with marks for Spanish language, with a validity coefficient for the total indicator score that was similar to PROESC and EVAPROMES, between .33 and .35. Similarly, the correlation between the indicators and the other two measures (convergent validity) was approximately .31, higher than the correlation between EVAPROMES and PROESC (.25). The multiple validity of the three instruments for performance in Spanish language, estimated using a linear regression model, reached a correlation of .48 ($\beta_{\text{indicators}} = .22$, $\beta_{\text{PROESC}} = .21$, $\beta_{\text{EVAPROMES}} = .23$, all of which were statistically significant at $p < .001$).

An analysis by components showed that all the indicators significantly contributed to predicting marks in Spanish language ($p < .01$), and that spelling and structure were the indicators with the highest predictive values. In fact, a stepwise regression analysis showed that these two indicators contributed significantly to predicting marks in Spanish language, with a multiple validity of .36 ($\beta_{\text{spelling}} = .27$, $p < .001$ and $\beta_{\text{structure}} = .12$, $p < .05$).

Analysis of the difficulty of the indicators

Table 3 gives a description of the indicators, showing the frequency with which each indicator was used in the students' texts. This can be converted to a measure of difficulty with a range between zero and one, where zero indicates maximum difficulty, or never used, and 1 indicates minimum difficulty, or always used. As an initial result, we found that use of the quality indicators was less frequent in secondary education students' texts than in those written by primary education students: however, this difference may be an artefact due to the higher disinterest shown by secondary students or might reflect less emphasis in secondary education on teaching aspects that are essential to produce quality writing. In this respect, the metacognitive variable may be key to distinguish between disinterest and lack of instruction. Once acquired and assimilated, self-regulation operates automatically without the need for

students to recall their teachers' instructions. Therefore, if the metacognitive variable explains the presence of elements that determine the quality of written compositions, we can assume that the problem detected suggests a lack of instruction or the need in secondary education to emphasise the key elements that determine the quality of writing.

Table 3. *Means and standard deviations for the indicators*

	Total		Primary education		Secondary education	
	M	SD	M	SD	M	SD
1. TITLE	.2437	.3622	.5138	.3961	.1265	.2738
2. STRUCTURE	.7071	.3613	.8096	.2422	.6623	.3945
3. COHERENCE	.4661	.2935	.6541	.2279	.3840	.2811
4. GRAMMAR	.6083	.3651	.7021	.3083	.5674	.3805
5. STYLISTIC RES.	.1750	.2827	.4281	.3161	.0644	.1764
6. MORPHOSYNTAX	.5757	.3703	.5822	.3199	.5729	.3907
7. SPELLING	.4954	.3087	.6548	.2843	.4257	.2931
8. CREATIVITY	.2877	.2436	.4414	.2145	.2207	.2248

The differences shown in Table 3 are striking in some cases: 70.71% of written compositions presented the indicator structure, whereas only 17.50% presented the indicator stylistic resources, which was the most difficult. To test the significance of these differences, we performed a repeated measures ANOVA for the eight indicators to evaluate the effect of educational level (primary vs compulsory secondary education) and the variable sex (see Table 4).

Table 4. *Repeated measures ANOVA*

	df	F	Sig.	η^2_p
Indicators	7.3304	219.769	<.001	.318
Indicators x Sex	7.3304	1.109	.354	.002
Indicators x Level	7.3304	30.065	<.001	.060
Indicators x Level x Sex	7.3304	3.335	.002	.007

Sex	1.472	17.978	<.001	.037
Level	1.472	106.803	<.001	.185
Sex x Level	1.472	0.019	.890	.000

Table 4 shows that the variable indicators (i.e. differences in difficulty) presented a greater effect size followed by educational level and interaction of indicators with educational level and sex.

In terms of sex, female students obtained better results in the writing tasks than male students (mean .54 vs .45). With regard to the variable educational level, primary education students obtained better results than compulsory secondary education students (mean .61 vs .38).

As regards interactions, the only one with a significant effect size was the interaction between indicators and educational level, which Table 3 shows was primarily due to differences between primary and secondary education for the indicators title and stylistic resources.

Difficulty of the indicators in relation to PROESC and EVAPROMES

In the light of the results of the preceding analysis, we wondered if the effects observed could be explained by other variables, and more specifically, whether the indicators of difficulty used in the study were summarised in the scores for PROESC and/or EVAPROMES. To answer this question, we conducted another repeated measures ANOVA, but this time including two covariates: scores for the PROESC subtest and the EVAPROMES questionnaire. When these two measures were included as covariates, it became possible to correct and explain some of the previous results (see Table 5).

Table 5. ANOVA with covariates PROESC and EVAPROMES

	df	F	Sig.	η^2_p
Indicators	7.3255	1.010	.422	.002
Indicators x PROESC	7.3255	2.619	.011	.006
Indicators x EVAPROMES	7.3255	6.759	<.001	.014
Indicators x Sex	7.3255	0.379	.915	.001
Indicators x Level	7.3255	32.766	<.001	.066

Indicators x Level x Sex	7.3255	3.050	.003	.007
Sex	1.465	8.450	.004	.018
Level	1.465	113.422	<.001	.196
Sex x Level	1.465	0.048	.826	.000
PROESC	1.465	38.783	<.001	.077
EVAPROMES	1.465	21.622	<.001	.044

PROESC was the variable that showed the greatest effect size (it was the test that was the most similar to the assessment indicators considered), whereas the differences in difficulty of the indicators ceased to be significant when EVAPROMES was included, even though it had a smaller effect size. In addition, when the covariate PROESC was included on its own, the factor indicators continued to be statistically significant [$F(7.3325) = 27.64$; $p < .001$; $\eta^2_p = .06$], but when only the covariate EVAPROMES was included, this factor ceased to be statistically significant [$F(7.3290) = 1.08$; $p = .38$; $\eta^2_p < .01$], as can also be seen for the factor indicators in Table 4 when both covariates were included [$F(7.3255) = 1.01$; $p = .42$; $\eta^2_p < .01$].

Discussion and conclusions

The analysis performed to determine the difficulty of the indicators revealed a significant difference between some of them, such as title, stylistic resources, spelling and creativity, at both educational levels, but especially in primary education. While 51.38% of primary students used a title, only 12.65% of secondary students did so. This appears to be due to the working methodology used and the standards demanded in class at each educational level. Hence, it is predicted that the use of a title is more common in writing assignments in primary education—due to the working method used by teachers at this level—than in secondary education.

Use of the indicator stylistic resources can be explained by the higher standard required to obtain a positive assessment for written compositions in compulsory secondary education. Thus, to obtain a score of 1 for this indicator in secondary education, compositions had to contain at least two figures of speech (one personification and one comparison), whereas to obtain the same score in primary education, they only had to contain one (a personification). In other words, secondary students had to use one more stylistic resource.

As in the case of stylistic resources, the difference in spelling was explained by the higher standards required for the compositions, which had to contain fewer errors of arbitrary spelling at secondary education level. In the case of creativity, the texts produced by primary education students were more similar to the fantasy stories and tales used at this level, while those produced by secondary education students were more realistic, in consonance with the much more mechanistic methodology used at this level.

With regard to the rest of factors between levels, we found a difference between the categories of coherence-cohesion, but this did not achieve significance. Such cases were also due to difference in the standards required for indicators between educational levels. At secondary education level, compositions were expected to be longer and to display greater development, with perfectly clear and connected ideas, than at primary education level.

To evaluate the capacity of the measures to predict the difficulty of the quality indicators, we included the scores obtained for the PROESC subtest and the EVAPROMES questionnaire as covariates. These two measures may explain the difficulty of the texts. Thus, the PROESC subtest presented the greatest effect size in global terms, which was to be expected as its assessment criteria were most similar to the indicators selected for this study. However, EVAPROMES was the covariate that best explained the differences in difficulty of the indicators, since these differences ceased to be significant when it was included. This indicates that the metacognitive strategies explained the differences in difficulty between indicators, because the relative differences in difficulty as measured by the writing quality indicators disappeared when they were related to the strategic processes underlying the written composition, assessed by EVAPROMES.

Knowing how to apply metacognitive strategies is one of the greatest predictors of academic success in the classroom. Considered a key metacognitive element and a basic skill in the Spanish education system, self-regulation is one of the components that predict academic success at university (García-Ros & Pérez-González, 2011) and can be defined as the degree to which a student participates in his or her own metacognitive learning process, including behavioural and motivational as well as cognitive factors (Zimmerman, 1998). However, students should be taught how to use metacognitive strategies before they go to university, and numerous studies have even suggested that such instruction should begin in pre-school education (Entwistle, 2000; Jiménez & Puente, 2012; Melot, 1990; Nisbet & Schucksmith, 1986; Ortiz, Salmerón & Rodríguez, 2007). Students who have not yet attained an appropriate meta-

cognitive level when they reach secondary education tend to be unable to implement suitable strategies to perform the tasks required of them. To overcome this problem, concerted efforts should be made in primary education to teach metacognitive strategies until their application has been internalised and can be transferred and applied to any area of everyday life. It is only once these strategies have been used regularly and assimilated in primary education that they will be deployed in secondary education and subsequent educational levels without prior instruction. This would have a positive impact on academic success and would considerably reduce school failure and drop-out rates.

Metacognitive self-regulation influences planning processes (e.g. selecting and organising strategies that once deployed, will help achieve a goal, setting objectives to achieve and establishing a plan of action), monitoring (e.g. awareness of the suitability for attaining a goal, detecting difficulties in the execution of a task and awareness of the possible reasons for these difficulties) and evaluation (e.g. assessment of the results achieved and the effectiveness of the strategies employed to perform the task proposed) (Jiménez *et al.*, 2009). Hence, students who apply metacognitive strategies for active learning and who activate their prior knowledge set goals and establish a plan of action, monitor performance of a task during execution, detect mistakes, apply strategies to resolve these without losing sight of the objective to achieve and evaluate both the results obtained and the process employed to attain the initial goal. These processes are deployed simultaneously in response to any academic task. When school tasks involve basic learning tools such as reading, writing and problem-solving, it is essential to apply metacognitive strategies as underlying elements aimed at academic success. In the present study, we have shown that particularly in the case of writing, it is precisely the application of metacognitive strategies that results in a quality spontaneous writing product. Students who deployed such strategies produced written compositions that were significantly different to those of students who did not.

Consequently, as noted by most of the authors reviewed (Albarrán, 2009; Barella, 2015; Camps, 2004; Cassany, 1995; Condemarín & Chadwick, 1990; Cuetos, Ramos & Ruano, 2004; Chávez, 2006; Fidalgo & García, 2009; Flower & Hayes, 1980; Fons, 2004; Gómez, 2008; Mateos, 2001; Morales, 2004; Morles, 2003; Sánchez, 2006; Quintero & Hernández, 2001; Scardamalia & Bereiter, 1992; Solé, 2004; Solé, Miras & Castells, 2000) and in studies on the indicators, various teaching approaches should be implemented in class which incorporate strategies that in principle require cognitive effort in order to ensure the internali-

sation of metacognitive strategies and thus enhance acquisition of this skill. In addition, more time should be devoted to the teaching and practice of spontaneous written composition.

Limitations encountered during the study

Although we used a broad, diverse sample, one of the main limitations of this research was its cross-sectional design, which did not permit us to observe the development of spontaneous writing skills through follow-up of the same students in subsequent academic years. It would also have been interesting to administer instruments that measured the motivational climate in class and students' interest and motivation, as well as other tests to measure spontaneous writing.

Future research

Possible future research could include longitudinal studies implementing meta-writing skills training programmes to assess their efficacy in writing (pre- and post-test), and the development of diagnostic tests to accurately measure the quality of spontaneous writing. It would also be of interest to determine the relationship between the indicators selected for the present study and other standardised tests that assess reading comprehension and/or meta-comprehension, bearing in mind that the processes involved in reading and writing occur simultaneously and share aspects in common.

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