

Escritorio Digital / Digital Desktop A Computer Program for the Teaching of Writing Skills

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Summary

This article describes a computer program designed to support the teaching of writing skills to pupils of Educación Secundaria Obligatoria (ESO) – compulsory secondary education – aged between 12 and 16 in Spain. Within this relatively under-investigated field, our aim was to provide language teachers with a tool that would help them tackle the difficulties pupils demonstrate when faced with a writing task. Such difficulties not only affect their performance in language study but also that in many other areas of the school curriculum and can even hinder access to certain cultural and social activities

The project was undertaken by the "Multimedia Educational Learning" Research Group at the Institute of Educational Sciences, University of Barcelona, which was set up to study the potential of information and communication technologies in education.

The Importance of Writing Skills

Writing is a social activity requiring individual cognitive processes (Olson, 1998; Hayes and Flower, 1980; Bereiter and Scardamalia, 1987). For the individual the activity has certain affective and motivational implications which, in close relation to the value which society places on writing, will determine his or her level of integration with the culture of the printed word (Hayes, 1996).

Given the multi-faceted nature of writing, it is not difficult to see the consequences, both social and cognitive, which a deficiency in this ability might have. The written language is not only a social act but also an act of collaboration and constitutes one of the most autonomous uses of language. It is an important instrument in the elaboration of thought processes, a tool for intellectual development, which enables the individual to use signs that are less dependent on context, and thereby encourages the emergence of abstract operations. At the school age –the age with which we are concerned here– the

written text is an indispensable tool in teaching–learning processes both in language study and throughout the school curriculum and it can even facilitate performance and involvement in cultural and social life.

For all these reasons writing is a subject of great interest in the education system.

The Teaching Of Writing Skills Via Computer

Technology and the School

The use of the word processor in all walks of life has been perhaps the most significant impact of the introduction of the computer. Similarly, the teaching of writing skills has undergone progressive change as the use of computers has become widespread. As with other innovations, the education system is not immune to progress, but it does not always keep pace with requirements.

For around 20 years now, computers have been used in schools for many different functions, including the teaching of the "basics", the carrying out of experiments, the managing of the school or quite simply for writing. However, this last function is by no means commonplace. Unfortunately, the rate of technological advances in the computing industry has often meant that schools are left using old machines, or hardware that cannot take advantage of the possibilities provided by the software. The pace at which software is evolving and the schools' limitations for renewing hardware explain why computers have yet to replace typewriters altogether in many schools.

Initially, the benefits of using computers in education were only appreciated by a small percentage of teachers. Today this situation has changed and many teachers use them regularly or express a wish to be able to. However, this increase in use has led to a greater awareness of the deficiencies that exist. This change in attitude is directly related to the training teachers at all levels have undergone as well, of course, to the social evolution in the use of computers, reflected in the media and among the students themselves.

In short, schools have responded positively to the use of computers in the teaching process and, in particular, for the specific task of teaching writing skills. In this sense, schools today are much more open to the idea of incorporating these technologies, despite the day–to–day difficulties encountered in their usage. These difficulties (lack of infrastructure, training and adequate software) will not be resolved in the short term, but although slow, the change is now unstoppable.

Writing with a Computer

Computers are used to varying degrees in language activities in schools, as well as more specifically for writing activities. They are put to three main uses:

1. Word processing (here we include page formatting): this is the most common use and most of our earlier comments are derived from this use. Little more can be done than to encourage the use of word processors, while making them as user friendly as possible. Some processors and formatters are designed for professional use and are unnecessarily complicated for the needs of most schools.

2. Spell checking: this is a useful tool that is now integrated into most word processors. They not only correct spelling mistakes and other keyboard errors, but will identify errors in syntax. Here again little more can be done than to encourage their use.

3. Directed learning: this includes numerous small applications directed at teaching specific aspects of the writing process. We believe that it is in this sector where schools are missing out most on potential applications. These can be of many types and directed at a wide range of ages:

a) First, there are what we might call 'exercises'. In this category there are dozens of small programs which focus on problems of detail (in general, with a focus on spelling or grammar), which the student has to solve by adding a letter or writing a word and which the computer corrects automatically.

This type of exercise can incorporate a high degree of complexity, though, in general, they will revise skills at a fairly rudimentary level. Most of them correspond to a psychological model that is almost behaviourist and their value lies in the fact that they can be repeated indefinitely. In spite of this, their interest level is high, given the fact that in many cases their very closed nature means that pupils deal with them easily and consequently find them motivating. However, with multimedia additions many of these exercises can become quite sophisticated and acquire a high educational value.

b) Second, we find the tutoring programs that teach parts of the process of writing production.

These programs provide assistance with part of the writing process, in general referring implicitly to a model of the said process, frequently to that of Bereiter and Scardamalia (1987). At the same time, they offer strategies for the acquisition of the different skills involved in this process. Many of the strategies are presented in model format: the introduction of a model text, the deconstruction of its parts or constituents and, on occasions, the chance to incorporate pieces of information by the user herself, providing a form of step-by-step tutorial along with the gradual incorporation of guidelines for the organisation of certain text types for specific purposes.

Unfortunately, no program with these characteristics is available in either Catalan or Spanish. It is this gap that this paper seeks to address.

Escritorio Digital / Digital Desktop: A Computer Program for the Teaching of Writing Skills

The project which we describe below is called "Escritorio Digital" and is registered under the support systems for the process of the production of written texts, in the form of guided learning. Unlike the programs mentioned above, Escritorio Digital was designed as a program to meet the problems that occur on a daily basis in language classes, that is, adapted to the curriculum rather than as something that has been designed in isolation (as is the case with Writer's Toolkit and Writing Partner). Before implementation, a preliminary study was carried out on the following features: the curricular proposals for the teaching of language in secondary education, the textbooks, and the language teachers' needs with respect to a program for the teaching of writing.

Curricular Requirements for the Teaching of Language in Secondary Education

Educación Secundaria Obligatoria (ESO) – the newly introduced compulsory secondary education system in Spain – recognises the need for students to have an awareness of the content of texts and text types. The objectives of this phase are the differentiation, interpretation and production of the main text types in relation to various subject matters, as well as the identification of the textual elements in each of them. The principle underlying these objectives is that all students be provided with the basic elements so as to be able to produce the different social and cultural uses of the written language.

This means that the focus is placed on texts and their means of communication: everyday texts of a social use (letters, application forms, curriculum vitae) and explanatory texts related to various components of the school curriculum at this stage.

The first evaluation of the written expression of the students of ESO was carried out in 1998 by the National Institute for Quality and Evaluation (INCE) (www.ince.mec.es/diag/ex14y16.htm). The results can be summarised as follows:

At the age of 14,

- 15% of the pupils are not capable of developing a basic story, so that the writing is a list of related events, without a detailed description of these events or their contexts.
- 65% of the pupils are capable of telling a basic or extended story in which the events are related and details are given. However, problems of coherence can be detected in the development of the story or the story is confused or incomplete.
- 18% of the pupils are capable of producing a developed story, with details and with a simple resolution of the problems or events.
- 2% of pupils are capable of telling a well-developed story, describing a sequence of episodes in which all the elements are well developed, the objectives and resolutions of problems are developed, the events are presented in a coherent way and are well expressed and, finally, the writer adapts the story to the reader.

It was found that very few students (4%) actually plan the content before writing the composition and when they do such plans take the form of very preliminary rough notes which are of poor quality. It was also reported that many students show little concern for the formal aspects of the different text types.

At the age of 16,

- 3.5% of pupils are incapable of producing a basic story.

- 44% of pupils can tell a story (14% basic/30% extended) in which episodes are related and details included. However, some problems of coherence and syntax are detected in the development of the story, or the story is confused, incomplete or lacks internal logic.
- 52% of the pupils are able to construct good stories.
- 37% of pupils are able to produce a well-developed story.
- 15% of pupils are able to construct well-worked out stories.

We observe that older pupils have a higher level of writing skills, both in terms of the quality of their stories and the presentation and the composition of the text. However, very few pupils at either age give any thought to the structure of their compositions beforehand, and in the cases where they do they use rough notes that are of little value. Furthermore, all students suffer problems of inaccurate spelling, poor punctuation, a poor range of vocabulary, inadequate paragraph construction and an inability to structure effectively the different parts of the text.

The INCE survey, despite a number of objections that were raised when its findings were made public, reveals marked trends in the pupils of ESO. Moreover, it clearly expresses the need among most students for additional support at all points in the writing process – from the more basic and routine elements, such as spelling, to the more complex, such as the planning and revision of texts.

TextBook Analysis

An analysis has been undertaken of the text books used in ESO for teaching Catalan and Spanish (Escofet Roig, Garrote, López–Orós, Rodríguez Illera and Teberosky, 1996). It focused on two basic parameters: text typology and composition strategies/text comprehension, in order to identify the curricular design features incorporated in these textbooks.

The findings show a tendency to prioritise certain features over others. The categories of analysis most frequently referred to were, on the one hand, those dealing with theoretical content (centred mainly on the definition of text types, with a determination of their characteristics, elements and structure) and, on the other hand, individual exercises related to the text type being studied. In addition, the type of task containing the instructions "do", "write" or "produce" a certain type of text was the most frequently used.

It would seem to be the case, therefore, that there is a tendency to focus on text types, providing an explanation of the contents or theoretical aspects of the text in relation to the type, using a model text as a point of reference, before going on to practice exercises that require pupils to compose their own texts.

A computer program for the teaching of writing skills: Language teachers' needs analysis

Finally, an attempt was made to detect the perceived needs of the language teachers working in ESO. Teachers of Catalan and Spanish were interviewed about their use of computers in the classroom and

their level of computer expertise. The results of these interviews are summarised below:

- The knowledge teachers have of computers varies greatly. All of them showed an interest in the subject and recognised the need to use the computer in the classroom. Many work in schools that produce magazines and have taken courses in Desktop Publishing.
- Typically schools have computer rooms, equipped with an average of ten PCs, which are run by one of the teachers.
- Teachers stated a preference for computer support that would facilitate group work and for working in the school computer rooms.
- A need was expressed for a program that worked on text types and their structure, incorporated a spell checker, permitted immediate correction – including printing – and showed the progress of each student (number of correct answers/mistakes) in order to be able to conduct evaluations.
- Teachers claimed to work fundamentally with text types. Some teachers suggested the keeping of a logbook or diary to recount the incidents in class and the life of the students themselves. In general, value was placed on the use of notepads, in order that students might rewrite their texts and correct their own errors.

Basic considerations in the teaching of writing skills

Some of the fundamental ideas underpinning our work were based on the results of this needs analysis:

a) The consideration that the teaching of composition is not a single, global procedure with validity for any text but rather consists of a set of specific items to be learnt. Our point of departure is that one does not learn to write; one learns to recount, to describe, to explain, to argue. Evidence for this seems to be given by the fact that many of the difficulties students encounter are specific to a certain text type.

b) The combination of the two methods traditionally employed to teach writing composition: a focus on process (as propounded from within cognitive psychology) and a focus on product (more typical of socio-cultural and linguistic discourses).

Although our main concern is with process writing (considered the most effective way to teach writing composition in the English-speaking world), and thereby we seek to tutor the various stages in the composition of writing, we also give students continuous access to real model texts, that is, products.

- With respect to the process, we propose to guide the student not only in the writing phase of the text, but also in the previous stages (planning) and later stages (checking).
- As for the products, we have used texts that come from real social contexts, avoiding the use of "school" texts created expressly to exemplify our contents.

c) The linking of each grammatical or linguistic content to a text type. The traditional teaching of this content, undertaken in a theoretical context with no connection to text types, does not help students transfer these skills to the writing of texts.

These then are the ideas concerned with the teaching of writing skills which underlie our project. Below we outline the structure of the program *Escritorio Digital*.

Escritorio Digital: Description of the Software

Escritorio Digital is a computer application for the teaching of writing skills to school children between the ages of 12 and 16, used as a supplement to language textbooks in ESO.

Version 1.0 of this program, to be completed during the first term of 2000, will be available in Spanish and Catalan. It can be adapted to the specific content of each textbook while certain components can be adapted to the personal needs of the teacher. The idea, inherent within the name of the application, is that the student has access to a 'desktop' on which various help programs are available, all of which are related to the subject of Language.

The Structure of Escritorio Digital

The software is structured into four large modules:

1. – Cuaderno Digital / Digital Notebook

This module is the main component of the project *Escritorio Digital* and in accordance with the ESO curriculum it aims to familiarise the pupil with the linguistic, discursive, functional and communicative aspects of the most frequently found text types in our society.

The *Cuaderno Digital* is organised into seven teaching units corresponding to the following text types: literary narrative and news (subdivisions of narrative), literary description and definition (subdivisions of description), explanation, argument and instructions.

This classification is based on the suggestion put forward by Werlich (1979), and draws on the type of phrases used, the cognitive process characteristic of each and the structure of the sentences which form its textual base. Five types of texts are distinguished: description, narrative, explanation, argument and instructive. The subtypes which we include within the text types description and narration are in response to the consideration that texts as different as news and a story, for example, although belonging to a common type (narration) will require different strategies in their composition.

In outlining the content for each of these units, the contents of a help tool in writing skills are highly varied. The final choice is determined, in the main, by the theoretical approach – explicit or underlying – which is adopted about the written word and writing. In our case, we decided to adopt a dual process–product approach.

The contents based around the product are those adopted by the traditional textbooks. They are of a conceptual type and usually consist of an explanation of the specific genre and include a presentation of the model text and an explanation of its communicative and functional aspects (intention, situation, context, transmission, theme, etc) and its linguistic–discursive aspects (structure, features, elements, style, lexis, etc).

The contents based around the process are rarely found in the materials designed for ESO. Moreover the few references that do appear in the textbooks are more usually related to the tasks of reading or rewriting (identification of the main ideas in a text, summarising) than with the generation of a new text. Process-based contents include strategies that aid learning representation of the context, content planning (looking for ideas, developing them, relating them, etc), translation to a linguistic form (producing a textual structure, looking for a shared language with the reader, etc) and checking (rereading, evaluation, etc). This approach means establishing phases in the composition where questions asked, advice is given and suggestions are made that make the pupil reflect on various communicative (audience, purpose, etc) and thematic aspects (argument, subject, chronological order, etc) related to each of these phases.

For each of the seven units, the content of Escritorio Digital is distributed into six main blocks:

1. *Introduction to text type:*

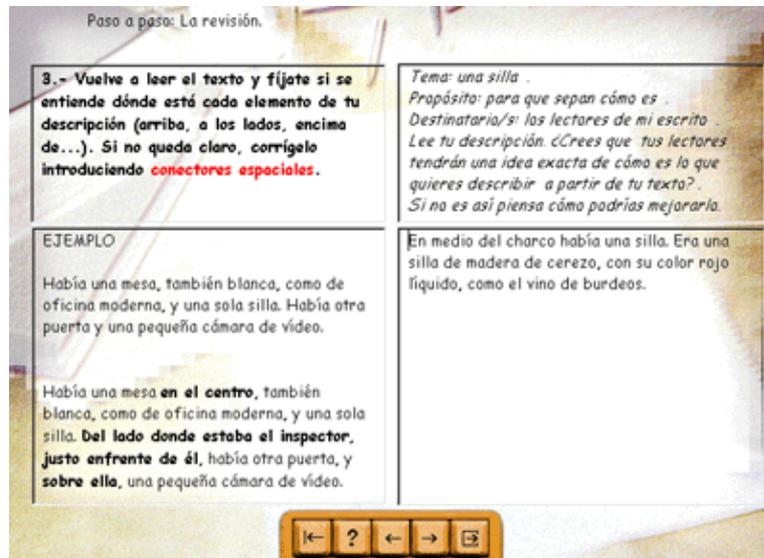
This is a theoretical presentation of the text type chosen offering the user, in hypertext format, situations in everyday life where the student might need to compose such a text, a definition and basic structure, a model text, a description of where the student is most likely to find the text type and so on.

2. *Tutoring of the writing process*

Step-by-step guide:

- analysis of the communicative situation (explanation of the subject, who the target reader is and the purpose).
- planning, both thematic (ideas) and structural (ordering these ideas).
- textual stage, comprising a series of tips for writing this specific text type. Each of these suggestions has a hypertext linked to an example of its use and to relevant help with grammar and linguistics.
- checking of all the aspects mentioned in the previous points. Here again there is an optional access to help pages and other examples that show texts that need improving and corrected versions.

Figure 1: Cuaderno Digital



The phases in composition writing are presented in a fixed order and are included in an explicit way. But the user has the option at any moment of going back and making changes to what was done in previous phases, in an attempt to approximate the workings of the program to the conditions in which the writing of a text is produced in real life. In a real situation, the implied sub-processes do not happen linearly in a given order, rather they are in constant interaction with each other. Moreover, there are multiple differences in individual style: there are writers who dedicate a lot of time to planning before writing and who make few changes afterwards, while others merely sketch out a plan and constantly reformulate. Similarly some writers only stop to check what has been written at the end of the process, while others check and revise every step of the way. A good tool should be sufficiently flexible to allow for this diversity.

3. Assistance

This refers fundamentally to grammatical aspects (syntactic or lexical) and linguistic (expressive resources) specific to each text type. As we have seen, it is possible to gain access to this support at any point in the writing process.

4. Model texts

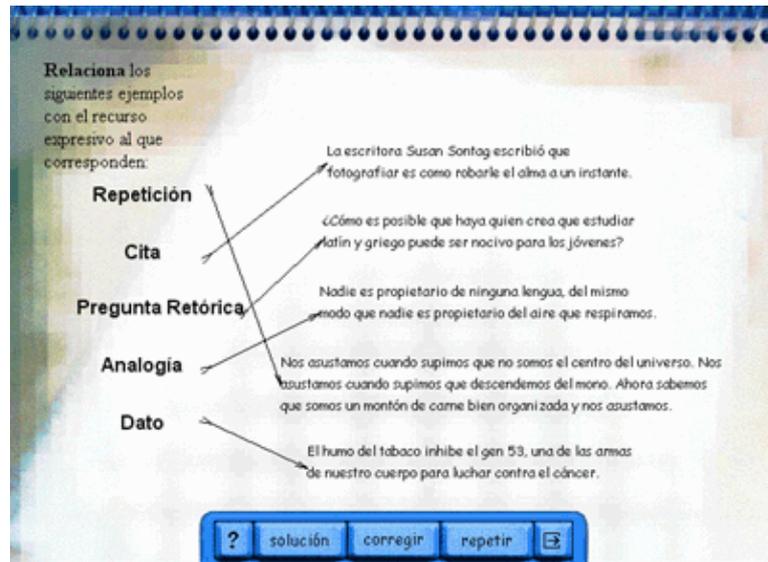
These are "real" texts, in the sense that they are not created for use in learning situations and they introduce examples of texts which, traditionally speaking, fall outside the school remit. They mix literary and non-literary approaches, in an effort to respect the tight language-literature relationship. The teaching of the comprehension and production of texts implies global learning, which gains considerably from the parallel consideration of language and literature.

There is an average of 12 model texts for each text type. Both in the choice of these texts and in the fragments used as examples, we have tried to ensure that the subjects covered

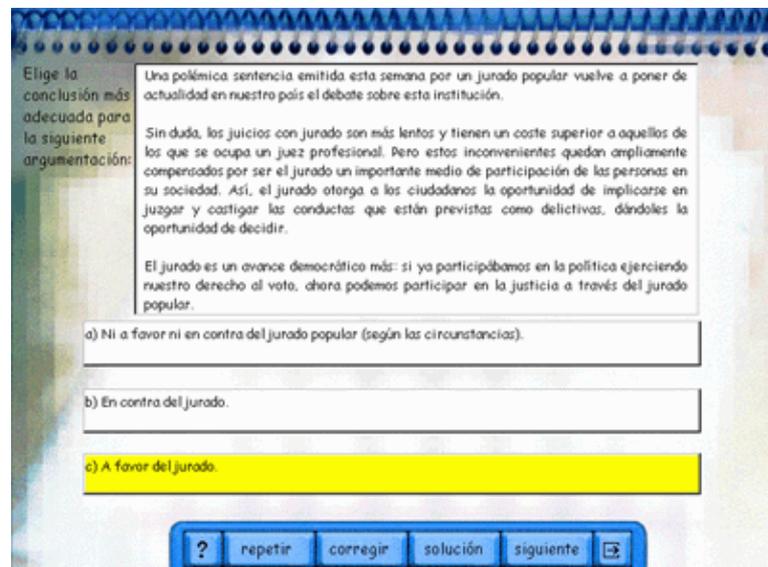
were motivating for our target users (12–16 year olds), given that this is fundamental in interesting them in the culture of the printed word.

5. Exercises

These are dependent on the text type to which they are linked (for example, the completion of fragments with causal connectors and adversatives is associated with argumentative texts, the classification of adjectives according to meaning is linked to description, etc). The exercises include the ordering of fragments or the filling of gaps to reconstruct a text, classification in a table or matching with arrows of expressive resources and their examples, among others.



Figures 2–3: Exercises



Figures 2–3: Exercises

They are closed activities, in which only one correct answer is possible. The program itself checks the responses and provides the correct answer when needed.

6. Games

The program includes Tornado of Questions, Hidden Sentence and Words against the Clock. The first of these can be played by up to three players and has a similar mechanism to Trivial Pursuits, incorporating three sets of questions: knowledge of text types, general knowledge about language and "surprise" questions (general culture, logic games and guessing games). Hidden Sentence is played in the same way as Hangman, two players try to decipher, letter by letter, a phrase related to the theoretical content explained in the program. Finally, the last game is for one player and consists of ordering a series of letters to reconstruct a word within a certain time limit.

2.- The other modules: DictaDigital, OrtoDigital and Activities

The remaining modules available on the 'desktop' of the computer are considerably less complex than the Cuaderno Digital, and they have, at least in this version, a complementary objective.

The first module, DictaDigital, presents the students with dictations classified in two levels of difficulty. Students can control various aspects of the recorded texts, on which they can carry out three types of exercise. One hundred dictations in Spanish and one hundred in Catalan constitute the basic corpus of the module.



Figure 4: DictaDigital

Two particular features of interest of this module are the future inclusion of the Editor, which allows the teacher to generate her own exams, as well as include her own dictations, together with the system whereby students can record their exam answers, in a semi-autonomous way, on diskette for the teacher to be able to correct.

The second module, OrtoDigital, is a generator of multiple choice exams containing spelling questions. Based on a corpus of a thousand questions for each language, classified by level and error type, the application generates exams at random according to the parameters of level and linguistic typology selected by the user.

Finally, the module of Activities is conceived in quite a distinct manner: designed for use in the computer room, it presents different types of non-instructional activities, of short duration, which can be used in extra periods of time at the end of a long session. The Activities which make up the module are

varied and they are not intentionally connected to each other: hieroglyphics, crosswords (with the Editor so that the teacher can add others), finding the hidden sentences, discovering the hidden picture, 'cloze' or gap filling, etc.

Future Versions of the Escritorio Digital

At the time of writing, the evaluation of version 1.0 of the program is being programmed undertaken with pupils of Spanish and Catalan studying ESO, in order to make any necessary modifications to version 2.0.

The future development of Escritorio Digital will depend on many factors, but especially on the use teachers and pupils get out of it and the results it is shown to have. It is envisaged that the improvements that will be undertaken will be aimed at devising a better tutoring system for the process of composition, as well as the support of collaborative activities between teachers and students, on the one hand, and between students, on the other.

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