Data-Driven Learning and Awareness-Raising: An Effective Tandem to Improve Grammar in Written Composition?

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Abstract— **The present paper, framed within the ECTS scheme currently being piloted at the University of Jaén, reports on a study carried out in the second semester of the academic year 2004-5 with English Philology freshmen at this University. One of its aims, described in an initial section of the paper, was to determine whether the use of Computer Assisted Language Learning (CALL), and Data-Driven Learning (DDL), could help raise awareness of and thus remediate the grammar weaknesses of such pupils under four categories (articles, verb tenses, verbal complementation, and prepositions). The procedure, outlined subsequently, involved using DDL to raise awareness of the main grammar mistakes in these headings, which had been previously identified in first year students' production through the use of an UCLEE-error-tagged written learner corpus. Two one-hour seminars were employed weekly, each one with a group of 40 students, to raise awareness of these mistakes with the help of web-based resources. Four were the steps undertaken: initial attempts on the part of the students to identify the mistakes in the seven headings; a session provided by the authors on CALL as a means to raise awareness of, identify, and solve written mistakes; use of these electronic resources to contrast their initial error identification; and explicit correction of the mistakes in each category. The results and implications, discussed in a final section, highlight that DDL and awareness-raising – albeit in some categories more than in others – indeed constitute an effective tandem when it comes to improving grammatical aspects in written composition at University level.**

Index Terms— **awareness-raising; computer assisted language learning; learner corpus; data-driven learning; written composition.**

I. INTRODUCTION

The present paper, framed within the ECTS scheme currently being piloted at the University of Jaén, reports on a study carried out in the second semester of the academic year 2004-5 with English Philology freshmen at this University, in order to determine whether the use of *Computer Assisted Language Learning* (*CALL*), as understood in the inclusive sense (Levy and Hubbard, 2005: 148), and *Data-Driven Learning* (*DDL*) (Johns, 1991; Johns and King, 1991) could help raise awareness of and remediate the grammar weaknesses of such students. The present investigation thus rests on three main pillars – the European Credit Transfer System,

awareness-raising, and Data-Driven Learning -, three concepts which constitute the theoretical framework of the study and which are consequently examined in the initial part of this paper. It then goes on to describe the research design and procedure of the investigation, subsequently outlining and discussing the results yielded by the latter. The pedagogical implications of the findings, together with the limitations of the study and suggestions for future lines of research, are broached in the final section of the paper.

II. THEORETICAL FRAMEWORK: THE EUROPEAN CREDIT TRANSFER SYSTEM, AWARENESS-RAISING, AND DATA-DRIVEN LEARNING

A. The European Credit Transfer System

As was mentioned in the introduction, the present study is framed within the ECTS scheme currently being piloted at the University of Jaén. The European Credit Transfer System was initially conceived as a way of facilitating the recognition of periods of study abroad and it was thus first introduced through SOCRATES-ERASMUS Exchange Programs. Its further development into a generalized credit system for the emerging European Higher Education Area (EHEA) was sped up by the Bologna Process, whose aim is to create the European Higher Education Area by harmonizing academic degree and quality assurance standards throughout Europe.

Its chief objectives consequently include enhancing the transparency and comparability of European study programs and qualifications; facilitating full academic recognition and thus student and teacher mobility within institutions, national systems, and internationally; and promoting key aspects of the European dimension in Higher Education.

The European Credit Transfer System is a student-centered system based on the student workload required to achieve the objectives of a program, which are specified in terms of learning outcomes and competences to be acquired. A credit – the value allocated to course units – is no longer conceptualized in terms of 10 hours of teaching time, but, rather, as 25 hours of work on the

part of the student, with the assumption that 60 credits represent the volume of work for one academic year. There is thus a radical shift from an initial focus on the figure of the teacher to that of the student. Furthermore, all forms of work are taken into consideration: not only contact sessions with teaching staff or lecture attendance, but also seminars, independent and private study, preparation of papers and project work, preparing for and taking examinations, and so forth. Evaluation methods also take into account the full student workload, reducing the weight previously assigned to the final exam and increasing the control of student participation in and attendance to the established activities (cf. García García, 2005).

In practice, it involves considerable methodological novelties which have been clearly appreciable in the subject of *Inglés Instrumental Intermedio* since the ECTS scheme began to be piloted in the English Philology Degree at our University two years ago. Although a quantitative, quasi-experimental study is being conducted throughout the course of the present academic year to provide empirical data on the functioning of the ECTS system in this subject (cf. Pérez Cañado, in press), we can anticipate that it has notably transformed the implementation and evaluation of *Inglés Instrumental Intermedio*, attaching much greater importance to the students' involvement and autonomy in the learning process and incorporating a more comprehensive array of activities into the so-called "seminars" which take place once a week. Following to a large extent the methodological recommendations of Casas Gómez and Márquez Fernández (2004), these seminars, where students are placed in reduced groups of 5 to 8 members, have capitalized on personal, independent, or private work and involved such varied activities as group debates, role plays, watching and commenting on popular sitcoms in DVD format, doing specialized reading activities, carrying out personalized correction of compositions and awareness-raising of the main mistakes discerned, conference attendance and summaries, personalized work on pronunciation aspects, "coffee and talk" sessions with students from different English-speaking backgrounds (The United States, Canada, Scotland, and England), the use of individual tutorials for problem resolution, or the incorporation of new technologies into language teaching.

This is precisely where the classroom experience on which we report comes in. It was developed, as we shall specify when outlining the procedure, during four of these seminars and it was geared at promoting the students' independent use of Computer Assisted Language Learning, through a process of self-discovery based on evidence from authentic language use, to improve certain previously diagnosed aspects of their writing skills.

B. Awareness-Raising

This improvement would be hopefully brought about through awareness-raising by means of CALL and DDL.

The concepts of awareness, consciousness, noticing, or attention - the second pillar of this study – have sparked off heated debate, particularly over the course of the last two and a half decades. Testifying to this are Lightbown (2000: 439), who points out/highlights that " … noticing is the topic of considerable ongoing debate"; Ellis (2001: 63), who considers the role of attention and consciousness in language learning a "complex and long-standing question"; Sharwood-Smith (1981: 167), who stresses that "consciousness-raising cannot or should not be treated simplistically"; or Segalowitz and Lightbown (1999: 48), who claim that "Perhaps the most widely discussed psychological topic in the SLA literature at the present time is the role attention plays in L2 acquisition". It is what Stern (1983) terms the code-communication dilemma in language pedagogy: to what extent should instruction be directed at raising learners' consciousness about the formal properties of the L2, as opposed to providing opportunities for them to engage in natural communication?

As Segalowitz and Lightbown (1999: 48) put it, "Several positions have been staked out with respect to attention and learning in SLA". On the one hand, we find authors like Krashen (1979), who considers conciousness-raising a luxury of highly dubious value since learners can only profit from learned knowledge roughly after puberty, as learned knowledge is only accessible given time and focus on form, and because some learners hardly ever or never use learned knowledge. Paradis (1994) also rejects the necessity of attention for the acquisition of action programs or procedures. In fact, he claims, attention to the form to be acquired can be counterproductive, as it reduces the efficacy of its acquisition by treating it as explicit and hence not internalizing it. In a similar vein, Truscott (1998, cited in Segalowitz and Lightbown, 1999: 48) opposes the view that noticing is a necessary condition for learning, as does the Competition Model (mentioned by Segalowitz and Lightbown, 1999: 48), which is based on the premise that learning takes place in the absence of attention. That is to say, learning is held to be automatic (not consuming attentional capacity) and implicit (not requiring intention), and repetitive exposure to input is considered sufficient for learning to take place.

And, at the other extreme of the controversy, we locate psychologists like Berry (1994) and Winter and Reber (1994), who hold noticing to be important for explicit learning generally, and linguists like McLaughlin (1978), Bialystok (1978), or Ellis (1994), who do not consider consciousness-raising a time-wasting procedure, but, on the contrary, see it as something important for SLA. However, its strongest advocate is undoubtedly Schmidt (1994, 2001), who, in his strong version of the Noticing Hypothesis, maintains that attention is essential for learning: "While the intention to learn is not always crucial to learning, attention to the material to be learned is". It is crucial on a number of counts (Schmidt, 1994b: 176): it is the necessary and sufficient condition for encoding a stimulus into long-term memory; efficient retrieval depends on the quantity and quality of attention

at the time of encoding; and it is essential for input to become intake in second language acquisition. Furthermore, the concept of attention is necessary in order to understand practically every aspect of SLA (Schmidt, 2001: 3): the development of interlanguages over time, variation within them at particular moments, the development of L2 fluency, the role of individual differences in L2 learning, and the manner in which interaction, negotiation for meaning, and all forms of instruction contribute to language learning. Although there might be some possibility of unattended learning, it is limited in SLA, with attended learning being far superior in this context. Evidence from Schmidt and Frota (1986), Hulstijn (1989), Altman (1990), Long (1991), Alanen (1992) (all cited in Schmidt, 1994b: 176-8), and Al-Hejin (2004) testifies to this. Finally, as regards the question of what specifically in L2 input must be attended to, Schmidt (1994b, 2001) solves the conflict between the encoding specificity hypothesis and the global attention hypothesis by vouching for attention which is specifically focused on whatever features of the input are relevant for the target system, and not just on the input in a global sense.

Although the controversy has been alive since the mid-70s, it is only in recent years (as Sharwood-Smith, 2000: 275) points out, that research has provided a "more fine-grained approach" to these concepts. Indeed, although such related terms as attitude, consciousness, and awareness have been used interchangeably in the literature due to the fact that they are "inherently connected" (Al-Hejin, 2004: 2), they are increasingly distinguished in more subtle/precise categorizations, such as that put forward by Schmidt (1994a). He identifies four dimensions to the concept of *consciousness*. The first of them is *intention*, which involves deliberateness on the part of the subject to attend to the stimulus provided. *Attention* is the second dimension, which refers to the detection of the stimulus. If the subject has knowledge that (s)he is detecting the stimulus, this leads to awareness, the third *dimension*. Finally, the fourth dimension is *control*, which indicates the amount of processing effort which the production of output requires: considerable if such output is controlled or scarce if it is spontaneous.

Diverse types of consciousness-raising have also been distinguished, as, in Sharwood-Smith's (1981) view, it can vary along two dimensions: *explicitness* (which refers to the extent to which the teacher makes use of linguistic metalanguage) and *elaboration* (which concerns the amount of time taken up in the presentation of a rule), thereby giving rise to four basic types of consciousness-raising, summarized in the figure below (1981: 161):
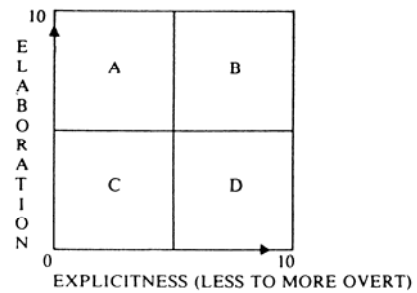

Fig. 1. Dimensions and types of consciousness-raising

Type D is the most familiar and traditional one, involving highly overt consciousness-raising through concise prescriptions embedded in an accessible metalanguage. It is also, according to Sharwood-Smith, the most limited in accuracy and effectiveness. In turn, Type C entails offering brief indirect clues that can lead to a feeling of self-discovery in the learner. Type B provides elaborated and explicit guidance, while Type A also implies an elaborate presentation, albeit more covertly carried out.

In the present study, we have worked primarily with type C, since, although, we clearly provide explicit instruction in our computer-assisted intervention, it is brief and essentially aimed at fostering autonomous learning and self-discovery by equipping the learners with the appropriate electronic tools. Our explicit instruction is also clearly in line with Schmidt's (1994b, 2001) encoding specificity hypothesis, since the learners' attention is focused on specific features related to grammar, rather than on input in a global sense. With our intervention, we have also sought to raise consciousness as Schmidt (1994a) understands it, since all four components (intention, attention, awareness, and controlled output) have been activated in the diverse stages of the classroom experience (cf. Procedure). Thus, all in all, in Stern's code-communication dilemma in language pedagogy, we have opted for raising learners' consciousness about certain properties – orthography and punctuation – of the foreign language through explicit instruction.

C. Data-Driven Learning

And we have done so, as has been previously mentioned, through the use of Computer Assisted Language Learning (CALL) and, specifically, Data-Driven Learning (DDL), the final backbone in our theoretical framework. Since the second era of corpus linguistics in the 1960s (Leech, 1991: 9), when machine-readable corpora such as the *LOB* and *BROWN* progressively began to become available, researchers have used the data in corpora to conduct corpus-based investigations for different purposes, such as the better descriptions of the language (Meyer, 1992; Aarts, Keizer, Spinillo and Wallis, 2003, etc.), corpus-informed grammars (Biber, Johansson, Leech, Conrad and Finegan, 1999), creation of dictionaries (Sinclair, 1987, etc.), the design of more appropriate materials for the TEFL classroom, (Mindt, 1996, Römer, 2006), etc.

Especially since Johns' (1991) influential article, the access to an unlimited quantity of authentic data was considered an interesting source of material for language learning (Stevens, 1991; 1995) and consciousness-raising by a *focus on forms* (Long, 1988; 1991) at different proficiency levels. By providing students with the possibility of learning languages by directly examining corpus data, i.e. DDL, this new methodology entails a very important change from deductive to inductive methods, and the subsequent shift in the teacher's role, from instructor to mediator.

This challenging approach entails a more active role by the students in their learning process, as they have a greater control and responsibility within it. If students are provided with adequate instruction on the exploitation of corpus-based data, mainly in *KWIC* format, and appropriate "masses of authentic language" (Higgins, 1991: 5), they can go through the three stages involved in DDL: observation, classification, and generalization (Johns, 1991). Therefore, this process may account for the lack of sufficient exposure to the target language and may help students to develop a reflexive consciousness about, or language awareness of, the FL and "make(s) the invisible visible" (Tribble, 1990: 11), in what has been referred to as a kind of high-tech version of Lee and VanPatten's (2003) "structured input" (Gaskell and Cobb, 2004: 316).

As a result of the students' active role, this type of *discovery learning* involves an exploration of the native speakers' production by the learners as if they were researchers, rather than "spoonfeeding" them (Tribble and Johns, 1990: 12). The low-competition and non-authoritarian environment which this learner-centred approach creates (Bernardini, 2002: 106) allows students, whether in groups, pairs, or individually (Meunier, 2002: 130-5), to work at their own pace and concentrate on those aspects of the language which they find particularly interesting or difficult. Besides, training students to use the concordancer to answer their own questions empowers the learner (Mair, 2002: 121) and fosters their necessary learning autonomy (Santamaría García, 1997: 376-7; Gavioli, 1997: 84; Bernardini, 2004: 27), which may lead to an increase of their self-steem, confidence, and motivation (Santamaría García, 1998: 94; Bernardini, 2002: 179; Yoon and Hirvela, 2004; Bernardini, 2004: 27-28).

Thanks to the improvements of CALL applications, corpora and their analysis by means of DDL are already being used by learners in and outside the classroom by means of projects such as Cowan et al.'s (2003) *ESL tutor*, Wible et al.'s (2001) *IWiLL*, Garnier et al.'s (2003) *KURD*, and, thus, as examples of "integrated CALL" (Bax, 2003: 21).

Apart from the students' use of authentic language in a wide range of divergent or convergent tasks (Leech, 1997: 11), non-native data or data from learner corpora (Granger, 1993) can also be used as a basis for DDL. This possibility, "learning-driven data" (Seidlhofer, 2002: 214), is a controversial issue, since the presentation of learner data, with errors and non-errors, to students may have negative effects and produce negative reactions (cf. Flowerdew, 2001: 376; Joyce and Burns, 1999: 48; Meunier, 2002: 129; etc.). However, the possibilities that the contrastive analysis of native and learner corpora offer open up a wide range of corpus-informed teaching materials of a great value (Granger, 2004: 297), both in top-down and bottom-up approaches (cf. Osborne, 2004), to make students aware of the gap between their production and that of the native speaker (e.g., Uzar, 1997; Flowerdew, 1998).

However, DDL also poses some limitations. To begin with, corpus use may not lead the learner to pedagogically appropriate generalisations (Aston, 1997: 52; Bernardini, 2002: 166) since students may not have the necessary analytical skills (among others, Kennedy and Miceli, 2002: 190; Chen, Warren and Xun-feng, 2003: 183). Students need to use these resources correctly, which involves having technical skills in using the software, selecting appropriate corpora, designing appropriate queries, and interpreting the results adequately. Therefore, guidance is needed (Johns, 1991: 31; Tribble and Johns, 1997: 58; Gavioli, 1997: 84; Thompson, 2001: 317; Flowerdew, 2001: 371; Kennedy and Miceli, 2002: 190, etc.), especially if a small corpus, which is probably preferable (Aston, 1997: 61), is not used. Another limitation that we can find in DDL is that discovery activities rely heavily on the learners' curiosity and interest (Bernardini, 2002: 167). However rich and supportive the learning environment, the teacher does not really know what will be learnt if a strict monitoring is not carried out, since serendipity learning (Bernardini, 2000) may take place. Students' different learning strategies and motivations should also be taken into account. For example, technophobic students may not feel at ease when working with a computer, so paper-based work may be more appropriate for them. Last but not least, it seems that DDL is more effective with the aspects of the language which are on the collocational border between syntax and lexis (Johns, 2002: 109). As a result, lexical and grammatical collocations (or colligations) may be the most suitable items to focus on by DDL. In a nutshell, DDL should not be seen as a panacea, "[…] but one among many techniques or aids which may be used to facilitate learning for some learners" (Kennedy, 1998: 293-4).

Many examples of materials based on DDL can be found in the literature related to ESP, EAP, lexical and grammatical acquisition, syllabus design and evaluation, translation, etc. However, few studies have attempted to prove the efficacy of such activities (see, among others, Stevens, 1991; Cobb, 1997; Uzar, 1997; Kennedy and Miceli, 2002; Sun and Wang, 2003; Gaskell and Cobb, 2004).

In this sense, our aim was to find out whether the combination of DDL and the web-based resources normally available for our students (that is, free online ones) would quantitatively and qualitatively help them improve their written production in English. In order to do so, the following procedure was followed.

III. RESEARCH DESIGN

A. Objective

In line with the foregoing, the objective of this instance of classroom research has been to determine whether awareness-raising through a brief, explicit intervention using CALL and DDL could significantly improve the performance on four grammatical aspects previously identified as being problematic for writing at Spanish University level – articles, verb tenses, verbal complementation, and prepositions – in first year of English Philology students at the University of Jaén.

B. Sample

We have worked with a total of 57 freshmen from the degree of English Philology and the double degree of English Philology and Tourism, since, in the past academic year, both degrees were placed together in the obligatory and core subjects pertaining to the English Philology area, among them *Inglés Instrumental Intermedio*. There was a predominance of female students (50), vs. male learners (7).

We did not divide the 57 students into a control and experimental group to determine the possible differential effect of our brief intervention program on their grammatical performance for ethical reasons, since we wanted all learners to benefit from the experience of employing web-based media and the DDL methodology.

C. Variables

Two basic types of variables have been considered in the study: dependent and independent.

- The *dependent variable* has corresponded to the performance of the students on the seven parts of the worksheet designed to measure their achievement before and after the intervention.
- This intervention has constituted the *independent variable*. Through it, the students have been provided with 30 minutes of consciousness-raising by means of explicit instruction in the use of web-based resources and DDL to detect and correct mistakes related to the seven afore-mentioned aspects of writing. This is what, in Seliger and Shohamy's (1989: 137) terms is called "the treatment", which they define as "a *controlled* and *intentional* experience, such as exposure to a language teaching method especially constructed for the experiment …".

D. Instruments

The instrument employed to measure our dependent variable has been a worksheet especially designed for the study and based on data provided by a previous investigation on the problematic areas of first-year students' interlanguage at the University of Jaén (cf. Díez Bedmar, 2005). This piece of research was based on an UCLEE-error-tagged learner corpus composed of the 67 essays, amounting to 26,259 words, that the 29 voluntary participants who began their studies of *English Philology* in the academic year 2002-2003 at the University of Jaén wrote for a compulsory course in English language usage at intermediate level (*Inglés Instrumental Intermedio*). Therefore, the results from this investigation could be applicable to other first-year students at our University, since they roughly share the same external characteristics (number of years of formal instruction in the foreign language, stays in an English-speaking country, etc.) and the type of essays they are required to write for that compulsory course in the first year is the same (mainly descriptive, with topics such as 'The most beautiful place in the world', 'What I will never forget', etc.), so they are familiar with the topics and the vocabulary employed.

Six aspects of the foreign language had been highlighted as being the most problematic ones for first-year students, namely spelling, articles, verb tenses, lexis, style, and punctuation (Díez Bedmar, 2005: 11). Therefore, we used five of these categories for our worksheet (spelling, articles, verb tenses, lexis and punctuation), and decided to change the style aspect of the language for the use of prepositions and verbal complementation. As mentioned before, some aspects of the language, especially discursive ones, are not suitable to be analyzed by means of DDL (cf. Johns, 2002: 109), so style was discarded since a concordance line or a sentence in the worksheet would not be enough for students to notice the potential problem with which they were being presented. Articles, verb tenses and punctuation, also being discursive aspects of the language, were maintained because the sentence level is normally enough to decide on their appropriate use. The addition of the two new problematic aspects of the language was motivated by the results of the above mentioned investigation (Díez Bedmar, 2005), which also identified them as problematic for first-year students, but to a lesser extent (see, for example, Díez Bedmar and Casas Pedrosa, 2006). Furthermore, they are on the collocational border which best suits their analysis with DDL (cf. Johns, 2002: 109).

A worksheet was thus drawn up taking into account these seven headings and ten sentences were included in each one (consequently with a total of 70 sentences being comprised in the handout), five of which contained mistakes and five of which were correct. Both the correct and incorrect sentences were taken directly from the writing of English Philology freshmen two academic years before, to ensure that they were troubleshooting problem areas for the sample and, thereby, to ensure the content validity of this instrument.

The learners were asked to spot and correct the mistakes in the ten interspersed sentences and were warned in the instructions that some of them were correct. However, it should be pointed out that even the correct sentences involved aspects previously diagnosed as problematic for students at this level. Thus, the worksheet was basically a proofreading and correction exercise of grammatical errors.

The appreciation of this type of testing facet has been heterogeneous. While certain writers like Tarasoff (1990), Hughes and Searle (1997), or Rosencrans (1998) all enhance the crucial nature of proofreading as an integral part of the writing process, other authors such as Jacoby and Hollingshead (1990), Gill (1992), Pattison and Collier (1992), Bosman and Van Orden (1997), or Ehri (1997) criticize it for not allowing reading and spelling to be evaluated as separate skills, for being easier than production tasks, and for being of dubious educational value to expose learners to incorrect constructions, as this might exert deleterious effects on the students, particularly when they are exposed to acceptable, commonly occurring, or intentionally created errors in multiple choice formats. We have avoided the latter, placing the mistakes contextualized within sentences. We have equally asked the students to correctly rewrite the mistakes words they spotted – and not merely to identify them – so as to combine word recognition with actual knowledge (since Henderson and Chard, 1980 maintain that the former is more sophisticated than the latter). Furthermore, if what Funnell (1992: 89) claims is true, namely, that "the ability to spot a *misspelling* [depends] upon whether or not the subject [can] spell the word correctly", then our proofreading facet should be of great value, as all corrected errors will reflect true knowledge on the part of the testees.

In turn, the instrument corresponding to the independent variable, that is, our explicit intervention, has been implemented roughly throughout the course of two ECTS seminars, each lasting 60 minutes, with approximately 30 students in each group, and continued in a subsequent class hour for roughly 15 to 20 minutes. The experiment was carried out from the last week of March to the first one of April, 2005, with a procedure that is outlined below.

E. Procedure and Design

The first step was to provide the students in each group with the worksheet and to explain the nature of the classroom experience they were about to undertake.

The learners were initially asked to spot and correct the mistakes they detected in each of the seven sections using a specific colour. They were given 30 minutes to do this.

Then, a brief session was provided by the authors on the use of web-based resources as a means to raise consciousness of (thus involving what Schmidt, 1994a terms interaction, attention, and awareness), identify, and solve written mistakes. The 30 minutes employed to do this were mainly devoted to showing students the tools in the word processor, *Word*, and the exploitation of search engines such as *Google*, the existence of dictionaries on-line, and the *BNC online service*. The reasons why the *BNC online service* was chosen can be summarized in three aspects. First, the online service is freely available online and, although it limits the results to 50, this number of instances is considered sufficient for highly frequent aspects of the language. Second, the *BNC* is a balanced corpus of British English, composed of 90% written English and 10% oral English. Therefore, it meets the needs of our students, who were concerned with non-specialised language. Finally, the *BNC online service* does not provide concordances in *KWIC* format but whole sentences, which was considered an advantage by the researchers, since students did not have to struggle with the inherent difficulty of reading concordance lines in such format, i.e. vertically and horizontally, within a limited context. To highlight the items they had searched and spot them quickly, students only had to use the 'look for' tool in the navigator, a tool with which they were rather familiar.

Subsequently, the subjects were given 60 minutes to use web-based resources (each learner had access to a computer with the necessary software) to contrast their initial error identification (what Schmidt, 1994 denominates control). They were asked to correct these mistakes on the same worksheet, but with a different colour to that employed in the first round.

Finally, the explicit correction of the mistakes in each category was carried out in a 15- to 20-minute session in the next class for further consciousness-raising.

Our investigation has this been based and conducted in the language classroom, the adequate place, according to Nunan (1991: 265) to carry out research: "As the language classroom is specifically constituted to facilitate language development, this should constitute sufficient justification for studying what goes on there". Such classroom-oriented research is defined by Seliger and Long (1983: v) as "research that has attempted to answer relevant and important questions concerned with language acquisition in the classroom environment", while Wallace (1998: 1) views it as "the systematic collection and analysis of data relating to the improvement of some aspect of professional practice". And, indeed, numerous authors coincide in stressing the relevance of this type of research, particularly for the teacher. Thus, Wallace (1998: 1) claims that "there is ample evidence that this approach can provide all sorts of interesting and helpful professional insights", while Madrid Fernández (1998: 9) maintains that "*la investigación en el aula es fundamental para mejorar tanto la formación personal del profesorado que la aplica como sus prácticas curriculares en el aula*". Nunan (1991: 266) is equally emphatic in this sense: "it is a way of helping teachers find, exploit, and extend their own best ways of teaching, at the same time as it provides a mechanism for the application, extension, and contestation of classroom-oriented and classroom-based research".

It is a modest instance of quasi-experimental quantitative research with a pre-test/post-test design, but valuable nonetheless in its classroom context, since, as Lightbown (2000: 453) sees it, it is a way of establishing a "fruitful collaboration" between SLA research and classroom teaching.

F. Statistical Methodology

The statistical methodology employed has been equally simple. Employing the SPSS (*Statistical Package for Social Sciences*) program, in its 12.0 version, we have calculated the statistical significance, by means of the T Test, of the differences between the means of the students in the seven sections under scrutiny before and after our intervention in order to determine the effects of the treatment.

IV. RESULTS

Table 1 T Test of group means on the pre-test and post-test on grammatical aspects.

Category	Mean of correct responses	p
Articles_1 and Articles_2	2,95	,000
	3,82	
Verb Tenses_1 and Verb Tenses_2	3,39	,058
	2,88	
VC_1 and VC_2	1,05	,000
	2,49	
Prepositions_1 and Prepositions_2	2,67	,000
	3,70	

As we observe in Table 1, there is a statistically significant difference between the group's means on the pre- and post-tests for the categories of articles, prepositions, and verbal complementation, in favour of the second application of the test. That is to say, on all these three aspects, the students have significantly improved from the pre-test to the post-test, and what is more, at confidence levels of 100%. These significant gains in the students' performance after the intervention thus seem to imply that the use of CALL and DDL to raise awareness of and correct these aspects is beneficial.

Exactly the opposite proves to be the case for verb tenses. In this section, we once again detect statistically significant differences between the means, but now, in favour of the first application. In other words, the use of DDL does not appear to prove fruitful to solve tense problems, since the students have significantly worsened their performance on this category after the intervention involving awareness-raising through DDL. They are less capable of detecting and correcting verb tense mistakes with the use of electronic media than without it.

V. DISCUSSION AND PEDAGOGICAL IMPLICATIONS

These results lend themselves to interesting discussion, and their implications are equally significant.

The two aspects under study which can be better identified as being on the collocational border between syntax and lexis are verbal complementation and the use of prepositions. The use of articles and verb tenses, however, broaden their scope to the discursive nature of language. For that reason, the analyses of the use of these two latter aspects of the language need more cotext and context than verbal complementation and the use of prepositions.

Nevertheless, three out of the four aspects under study improved from the pre- to the post-test.

The exposure to the fifty examples that the *BNC online service* provides for each query and the explicit information in the online dictionaries proved enough to help students confirm their hypotheses and solve their doubts in the detection of mistakes regarding prepositional and catenative verbs and the use of locative and temporal prepositions, in their respective sections.

As far as the use of articles is concerned, the examples students were provided with showed instances of underuse, overuse, and misuse of the definite, indefinite and zero articles. Furthermore, there was an instance of the confusion of the indefinite article 'a' with the possessive article 'one', which is a quite frequent error in the written production of our first-year students. It is interesting to notice that students were able to improve in their detection and correction from the pre- to the post-test by means of DDL, since article usage is not truly on the collocational border we were referring to before. Furthermore, understanding how articles are used entails reading whole concordance lines. Our results, therefore, are dissimilar to those in Gaskell and Cobb (2004), where article usage worsened from the pre- to the post-test. It is possible that the students' previous knowledge of the rules to use articles influenced their strategies to run the queries in the *BNC online service*.

Finally, the use of verb tenses was the only aspect under consideration which did not improve with the help of web-based resources and a DDL approach to language. Even though the examples in the worksheet provided the students with enough temporal information by means of time adjuncts, the discursive nature of verb tenses and their role as a coherence device caused problems for the students. This result is in accordance with Granger's suggestion that the teaching of verb tenses should be done at discourse level, since students tend to focus only on the sentence or clause levels (1999: 200).

Thus, our results suggest that, although the four grammatical categories considered in this investigation have all been previously identified as problematic and thus particularly pertinent for Spanish University students of extremely similar traits as those included in our sample, they produce starkly contrasting outcomes when analysed through the use of DDL. On the one hand, our outcomes highlight the importance of noticing or awareness-raising (as Schmidt, 1994a, 1994b, or Sharwood-Smith, 1981 maintain) through the use of DDL for improvement on verbal complementation, articles, and prepositions in academic writing. Sure enough, merely drawing the students' conscious attention to the usefulness of employing DDL to correct mistakes in short, focused sessions has been enough to produce a significant differential effect on performance on these aspects.

On the other, greater caution is required when it comes to considering verb tenses. Given the discursive nature of

some aspects of the language, DDL does not prove an efficient means to remediate the errors students commit in this category.

Thus, the main conclusion which our outcomes allow us to reach is that DDL and awareness-raising – albeit in some categories more than in others – indeed constitute an effective tandem when it comes to improving grammatical aspects in written composition at University level.

VI. LIMITATIONS OF THE STUDY

Although the present study has yielded interesting findings in all the categories presented in this paper and in the remaining three headings of the overall investigation, it is necessary to continue emphasizing, as we already pointed out in the Research Design section, that it is a modest piece of quasi-experimental quantitative research. It was conducted by capitalizing on and making the most of a classroom experience in an attempt to bridge the gap between SLA research and teaching, but we need to be well aware of its simple nature.

- Given the fact that we did not consider it ethical to disregard certain students by not providing them with the DDL treatment, we could not divide the sample into experimental and control groups, which would have been desirable to fully appraise the effects of the intervention.
- Since we unfortunately could not devote more seminar time to providing DDL language instruction, the study is based on a brief intervention program consisting solely in two sessions of ECTS class time.
- No intervening variables of cognitive or orectic/affective nature were considered in the study, nor were discriminant analyses performed to determine whether the intervention program was the variable truly responsible for the differences discerned.
- The students' learning styles and previous experience were not taken into consideration, so that subjects who enjoyed working with computers or had ample experience with them and those who did not followed the same procedure.

VII. LINES FOR FUTURE RESEARCH

Thus, fully aware of the limitations of the study, we now propose several lines for future research which could overcome these limitations and which we consider of particular interest.

- To begin with, it would be worthwhile to carry out a similar study, but, in line with the first limitation mentioned, with experimental and control groups, whose homogeneity should be

previously guaranteed, in order to determine the possible differential effect of an intervention program which would involve awareness-raising and explicit teaching of key aspects of academic writing through DDL.

- It would also be desirable to conduct a longitudinal study, similar to our investigation, but more prolonged in time, in order to determine if the effects of the intervention are any different.
- Adding a delayed post-test would equally be of great value in a longer investigation, as it would enable us to observe if the effects of the intervention are maintained or whether they gradually peter out.
- In connection to the third limitation presented in the previous heading, it would be interesting to consider intervening variables in a similar study in order to investigate the possible modulating effect they exert on University students' learning of academic writing through awareness-raising and DDL. Performing further statistical analyses such as discriminant analysis would make this goal attainable.
- It would also be necessary to determine whether there is some sort of transfer or interface from what the students have been taught in isolated sentences to their spontaneous writing, focused more on meaning and less on form.
- Finally, it would undoubtedly be useful to complement the quantitative data of a study like the present one with qualitative questionnaires, with both Lickert-scale closed items and open questions, to ascertain the students' perceptions about the utility of awareness-raising through DDL in academic writing instruction.

We are already working on three of these suggested areas of research, as we are in the process of determining the existence of transfer to the students' free writing, of replicating the present study but over a longer time span (one month of instruction in DDL), and of complementing the quantitative analyses with qualitative data.

Although we are left with a sense of complexity involved in such crucial issues as noticing and attention or DDL, we hope this study can contribute to smoothing some of the bumps along this still long and difficult road.

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