Computer-Based vs. Textbook-Based Grammar Instruction: Effectiveness and Students' Perceptions.

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Abstract

This paper reports on a study which analysed secondary education students' acquisition of two English grammar points using two different methods, paper-based and computer-based instruction. This research aimed at exploring and comparing the effectiveness of these methods and students' opinions on the usage of paper-based and online materials. In order to do so, 45 students receiving both methods of instruction were tested, and quantitative and qualitative data were gathered thanks to two grammar tests and three questionnaires. The grammar tests' results pointed out that, apparently, the differences in students' results were not linked to the method of instruction, paper-based or computer-based. Instead, it seems that scores were more determined by the grammatical point studied. Nevertheless, the questionnaires showed that students were more motivated when using online materials than paper-based ones. These results open new paths of research into the usage of ICTs for academic purposes.

1. Introduction

With the development of information and communication technologies (ICTs) and their inclusion in the classroom, researchers have been interested in the effectiveness of using ICTs to teach academic content. Nevertheless, little empirical work has been done yet, and that is why we have chosen this line of enquiry. We are particularly interested in using ICTs for English grammar teaching and in analysing students' perceptions on this usage. Although some research has been conducted on the efficacy of using computer-based materials as opposed to paper-based ones, there are few empirical studies that compare them from the learners' point of view.

Nowadays, schools are integrating all sorts of new technologies in their classes, such as computers, tablets, interactive whiteboards or even mobile phones. It is believed that students are more motivated using this kind of resources and it is also thought that teachers can benefit a lot from using ICTs. Language teachers in particular can have access to real data, thus offering a more meaningful learning that can help students in their real lives experiences. So using ICTs can make lessons more student-centred and students can become active participants. Apart from this, ICTs offer a great variety of exercises and activities that are at hand in any computer or in a similar electronic device. Moreover, they open up a huge range of new possibilities that would be unthinkable otherwise. For example, they can provide students with immediate feedback, learners can do collaborative tasks from their own homes and teachers can answer students' questions more quickly thanks to chats or forums.

However, we also have to consider whether schools, teachers and students are prepared to use ICTs effectively. It is known that not all schools have access to good quality technology and Internet connection, which impedes the good application of these new resources and which can even discourage both teachers and students. Besides, not all teachers are skilled enough at using ICTs, especially for teaching purposes, and students, although they are commonly believed to be very familiar with the use of new technologies, seem to find it hard to use them for learning purposes.

Previous studies have shown that, in general, those students who receive computer-based lessons outperform those who use paper-based materials. Nevertheless, little empirical research has been done testing secondary education students. Furthermore, few studies take into account students' opinions and perceptions, and

consequently there is a lack of research exploring this matter. For these reasons, we thought that it would be interesting to conduct a study to analyse the efficiency of computer-based materials as opposed to paper-based ones for English grammar learning in a secondary education context. Besides, we also aimed at examining students' points of view on the use of these new technologies for learning purposes in order to have a clearer idea of the usefulness of computer-based instruction. Apart from this, we hope that these data can help teachers improve their lessons, since students' thoughts need to be taken into account so as to match their learning needs.

In this research, we will first take a look at previous literature in order to learn about what other researchers have found out and what their studies have shown about the use of new technologies for academic purposes. Next, we will briefly explain the context of the secondary education school in which this study was carried out. This will show the students' sociocultural background and the kind of education they have received, two aspects which will surely play a role in the results. We will also make a description of the participants, the way in which they were divided and the kind of instruction they received. Then, we will explain this research's design, instruments and procedure in depth, giving an account of the different steps that we followed and the means that were used to gather quantitative and qualitative data. Data and data analysis description will show the way in which all the information was analysed and the results will cast some light on the effectiveness of computer-based instruction and on the students' perceptions on it. Finally, we will draw some conclusions that will help us understand this research's findings and the pedagogical implications of this work.

2. Theoretical background

One of the first studies that focused on the comparison of the effectiveness of textbook-based instruction and computer-based instruction was the one conducted by Nutta (1998). In her work, she compared students' acquisition of some grammar structures using the two previously mentioned methods of instruction. Her results showed that, in general, those students who had received computer-based instruction scored higher than the ones who had received textbook-based lessons. Moreover, students also expressed their satisfaction with this new methodology, highlighting some of its advantages such as the fact that these materials "allowed them to review the tutorial as many times as they wished, to proceed at their own learning pace, to record their voices […] and to get immediate feedback on the exercises" (Nutta, 1998, p. 57). Nevertheless, one of the limitations of Nutta's study was the fact that the participants were all university students, so she concluded that it would be necessary to conduct the same study with different populations.

More recent studies (Torlaković & Deugo, 2004) have compared the differences in the acquisition of adverbs in English between a group receiving computer-based instruction and a group that took paper-based lessons. The participants were all university students and the results proved again that the so-called "Computer Group" manifested a notable improvement from the pre-test to the post-test. Nevertheless, no significant improvement was seen in the group receiving textbook-based instruction, the "In-class Group". Furthermore, this study showed that there was a gain in confidence in the "Computer Group". Finally, the participants also agreed that computer-based instruction made them in control of their learning and, again, participants emphasised the fact that immediate feedback was a huge advantage. However, the study comprised a very small number of students, so a research taking into account a larger number of participants would be needed.

Similarly, Abu-Seileek's (2007) study compared the effectiveness of textbook-based English lessons and those in which computers were used. More specifically, this researcher conducted an experiment comparing computer-based grammar and paper-based grammar instructional methods in the acquisition of different English verb tenses. The participants were male university students and, once more, this study showed "that computer-based instruction could be more effective in teaching and learning verb tenses" (p. 72).

Another study that tried to analyse whether computer-mediated grammar practice improved student's achievements was Lys' (2013). In this case, the participants were a group of university students enrolled in a German language program. As in previous studies, results showed that the participants' language proficiency improved thanks to the online practice. Thanks to a survey, Lys also observed that "[s]ixty-five percent of the students indicated that the online learning environment was more or significantly more helpful than a conventional textbook" (p. 178).

As has been described, the participants of most of these studies have been university students, so little research has been done in other levels, such as secondary education. A notable exception was the study carried out by Abu-Naba'h (2012) with secondary students in Jordan. Half of them were taught the passive voice in English via computer, while the rest were taught the same grammatical structure using paper-based materials. Taking into account the students' results in the post-tests, the researcher concluded that there was a significant effect of the use of computers on the scores, since the students who had used computers achieved better results than those participants who were instructed using more traditional means.

Although all of the aforementioned studies have compared at least two groups who had been administered different kinds of instruction, none of them have taken into consideration students' perceptions regarding both methods of instruction. In this sense, Jarvis and Szymczyk (2009) explored students' opinions on the use of both kinds of materials. However, these materials were used out of the classroom by the students; in other words, the study analysed the effectiveness of these materials for independent grammar practice. Jarvis and Szymczyk's results differ from previous studies because they found out that students preferred book materials over websites. According to the participants, this was due to the fact that books presented the contents in a more systematic way and that they could take these materials wherever they wanted. This last assertion clashes with one of the advantages that has normally been attributed to ICTs, the argument of accessibility. Nevertheless, the researchers associated this posture with the participants' insufficient computer skills.

Charpentier Jiménez's (2014) research deals with students' perceptions on the use of ICTs in English teaching. In this study, an 11-item survey was passed to a group of BA undergraduate students in order to get information about their impressions. The study showed that ICTs were hardly used in the classroom and that students were not familiar with the use of these technologies for learning purposes. According to this study, "undergraduate students believe that faculty members do not use them as often as they should" (p. 15). Moreover, Charpentier Jiménez also highlighted that, since teachers serve as models to students, it is their duty to show students how to use ICTs to learn English. Finally, he concluded that this research should be replicated since technology changes, and that the analysis should be extended to show the opinions of students belonging to other educational levels.

Although results are mixed, all the aforementioned studies seemed to point out that those students receiving computer-based grammar instruction obtained better results than those taking paper-based lessons. However, one study signalled differences in the points of view of students regarding the use of online materials for independent practice, although the study justified this preference on the participants' limited computer skills. This seems to indicate a need for more empirical research in studies which include both students' perceptions and the use of both methods of instruction with both groups. For this reason, this research's intention is to enquire about which is the most successful method of instruction for the acquisition of English grammatical structures by non-native students, and also to reveal students' opinions and preferences on the use of different materials for in-class learning purposes.

3. Methodology

3.1. Context

San Cernin is a semi-private high school in Pamplona, owned by the Parent Educative Cooperative Society "San Cernin". In this way, the representatives of the principal entity are the rector board (elected by the General Assembly of the San Cernin Cooperative Society associates) and the headmaster.

As far as the educative model is concerned, this high school has opted for what it is called Model G (a model which does not include the teaching of Basque). However, apart from Spanish, other European languages are used in order to carry out the teaching process (French, English and German). Moreover, some of the foreign language teachers are native speakers, so the proficiency level of teachers in each of these languages is very high. Therefore, this is a multilingual school and it offers a mixed-sex education in all its levels.

Apart from this, if we take a look at this high school's methodology, we can conclude that it follows a teacher-centred approach. Lessons consist normally on master lectures and practical activities are rarely encouraged. In general, teachers stick to the textbook and, in the case of English in particular, to the preparation of Cambridge exams. Attention to diversity is also carried out embracing the compensatory model that proposes several supporting classes for those students who have particular educational needs.

Regarding the sociocultural context of the students, we could say that most of them belong to an upper middle class. Besides, the number of immigrant students is almost non-existent, although the school is not opposed to accepting them in its classes. This reality could be due to different reasons, such as the fact that San Cernin works with an enriched curriculum, so it is hard for someone who has not studied here to catch up with the rest of students. Moreover, one of the points of the selection criteria advantages those children whose parents have been ex-students, and another important issue is the high fee that parents have to pay for their children's education. Apart from this, we could also highlight that the number of students of the different sexes is more or less equal, while the number of male and female teachers varies significantly (80% females, 20% males).

3.2. Participants

In this research, the participants were 45 students belonging to two groups of 1st of ESO. They were distributed in already arranged classes. Therefore, the participants were not previously selected and we decided to call them Group A and Group B.

Table 1. Participants.

Group	A	B
Number of students	23	22
Age	12-13	12-13
Sex	13 females-10 males	16 females-6 males
Level of English	B1	B1

3.3. Design

The design of the study was a pre-post test quasi-experimental study based on two grammar points which were taught using textbook-based and computer-based instruction. The content had to be accommodated to the students' needs and the teacher responsible for these groups suggested that we should teach them the grammar contents that they were supposed to see that week in their textbook, which were *verbs with prepositions* and *so, such a, too, not ... enough.* In this way, each grammar point was assigned randomly to each group and the four sessions (of one hour each) were distributed in the following way:

Table 2. Distribution of sessions.

Group	A	B
Textbook-Based Lesson (1st session)	*verbs with prepositions*	*so, such a, too, not ... enough*
Computer-Based Lesson (2nd session)	*so, such a, too, not ... enough*	*verbs with prepositions*

During the first session, both with Group A and Group B, paper-based instruction was provided using a textbook. In this particular case, students were using Barraclough and Gaynor's book *Activate!* (2013). In this textbook, we can find a brief explanation of each grammar point, which needs to be supported by the teacher's elucidation, and different exercises (most of them fill-in-the-gaps ones) that help students understand and practise the content. The following day, the computer-based lessons took place. In these classes students went to the computers room and there, after a brief explanation given by the researcher, they started learning about the grammar point by watching a PowerPoint presentation and by doing different online exercises

(most of them had been created using Hot Potatoes and others belonged to different webpages). We could also mention that two different blogs[1] containing the pertinent theoretical explanations and exercises had been created for each group. However, after realizing that few students were able to gain access to those websites, the researcher decided to place those contents in the school's intranet.

Apart from this, it is also important to say that a pre-test had been administered previous to the first lesson, and a post-test was also handed out after the second instructional period. Furthermore, a questionnaire on students' perceptions of the different materials was also administered after each lesson and another one on the contrast between both kinds of materials was passed when the whole instruction was over.

According to this design, the independent variable was the method of instruction, which could be computer-based or teacher directed. On the contrary, the dependent variables were students' scores on the grammar tests and participants' preferences and opinions on the different materials that were used during the lessons.

3.4. Instruments

In this research five different instruments were used. On the one hand, two tests were administered to all the participants, a grammar pre-test before the instruction and a grammar post-test afterwards (see Appendix 1). They contained 16 questions, half of them referring to *verbs with prepositions* and the other half dealing with the use of *so, such a, too* and *not ... enough.* As we know, distinct kinds of questions used in tests usually lead to different results. Therefore, in order to obtain more reliable results, we used three different types of exercises. In the first activity, multiple-choice questions were used. For example, students were asked to complete the following sentence: "Call me back as soon as possible, I need to talk _____ you" and three different possible answers were offered: "with", "to" and "at".

The second activity consisted of fill-in-the-gap exercises in which participants had to complete sentences without being offered different answers: "When I can't find my shoes, I always ask my mother to look _____ them".

Finally, the third part of both tests consisted of open-ended sentences in which participants needed to use some words in brackets to complete the sentences: "Are you going to buy a Ferrari? No, I'm _____ _____ _____ to buy one. (rich)".

The sentences with both types of structures were mixed at random. Besides, it is important to say that both tests were very similar and that they differed only in some vocabulary items.

Apart from this, three different questionnaires (see Appendix 2) were also administered in order to find out students' perceptions of the different materials and their preferences. These questionnaires were written in the participants' first language, Spanish, in order to make them as clear as possible for the students. For this task, we used a Likert-scale in which students had to rate some statements depending on their level of agreement ("strongly agree", "agree", "uncertain", "disagree" and "strongly disagree").

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[1] http://sancernin1c.blogspot.com.es/
http://sancernin1d.blogspot.com.es/

The first and the second questionnaires included the same questions and measured student's opinions about using the textbook and online exercises for learning grammar respectively. The questions examined the students' impressions about the appropriateness of the materials regarding the students' age, level of English proficiency and their learning and practising needs, the clarity and amount of explanations these materials provided, the variety of activities, the way in which the contents were organised, the amount of examples offered, whether the materials were easy to use and the clearness of the instructions that appeared in the activities.

On the contrary, in the third questionnaire, participants were asked to compare the two different kinds of materials and to elicit the advantages and disadvantages of each one. For the first part of this questionnaire, we used again a Likert-scale in which students had to grade different sentences. As for the questions that appeared in this questionnaire, they measured participants' opinions about the effectiveness and usefulness of the materials enquiring about whether they were easy to use, whether using those materials was seen as a positive experience and whether students were motivated to use those materials in the future. In the second part of this questionnaire, participants had to fill in an open-question, which was a chart in which they had to write down the advantages and disadvantages of each kind of material.

3.5. Procedure

In the first session, a grammar pre-test was administered to both groups to check their previous grammatical knowledge of the two points of grammar they were going to be taught. Then, students received textbook-based instruction on each of the corresponding grammar points; Group A was taught about *verbs with prepositions,* and Group B learned about the use of *so, such a, too* and *not ... enough.* After the instruction, they completed grammar exercises in their textbooks. These consisted of fill-in-the-gap and multiple-choice activities. At the end of both lessons, students were asked to fill in the first questionnaire in which they had to state their views on the materials that they had used during that class.

Table 3. Procedure.

	Session 1			Session 2			Session 3
G1	Pre-test	Paper-based instruction on *verbs with prepositions*	Paper-based material evaluation questionnaire	Computer-based instruction on the use of *so, such a, too* and *not ... enough*	Computer-based material evaluation question-naire	Material comparison question-naire	Post-test
G2	Pre-test	Paper-based instruction on the use of *so, such a, too* and *not ... enough*	Paper-based material evaluation questionnaire	Computer-based instruction on *verbs with prepositions*	Computer-based material evaluation question-naire	Material comparison question-naire	Post-test

The following lesson consisted on teaching the same grammar points using computer-based materials. In this case, Group A looked at the use of *so, such a, too* and *not ... enough* and Group B learned about *verbs with prepositions.* First of all, students saw a Power Point with some theoretical explanations; then they had to complete different online exercises, including fill-in-the-gap, multiple-choice and matching activities. Then, the participants filled in the second and the third questionnaires; the first one measured students' views on the online-based materials that they had just used, and the second asked the students to compare the paper-based materials used in the first lesson and the computer-based ones used in the second.

Finally, in the third session, a grammar post-test was administered to all the participants to test grammatical acquisition.

3.6. Data and data analysis

In this research two different kinds of data were gathered. Quantitative data were gathered from the two grammar tests (see Appendix 1) and these data were used to analyse the effectiveness of textbook-based and computer-based instruction. Comparing students' scores in the grammar post-test to the scores in the grammar pre-test, we were able to see if there was any improvement due to the different kinds of instruction. Therefore, the effectiveness of computer-based instruction as opposed to paper-based lessons was compared taking into account the obtained results. Scores in these grammar tests were transformed to show the results in grades from 0 to 10, so they could be easier to understand.

On the other hand, quantitative and qualitative data were obtained from the questionnaires (see Appendix 2) and these were used to explore students' perceptions and points of view on textbook-based and computer-based instruction. Quantitative data were obtained from the Likert-scale question of the questionnaires and qualitative data from the open questions. Both were used to measure students' perceptions on each kind of materials and their preferences.

4. Results

The following table (Table 4) shows the means both groups obtained in the pre-test and in the post-test in the two different grammar points explained during the lessons (for the full table including students' results see Appendix 3).

Table 4. Pre-test and post-test means by Group A and Group B (grades out of 10 points).

STUDENTS	PRE-TEST *Verbs with prepositions*	POST-TEST *Verbs with prepositions*	PRE-TEST *So, Such a, Too, Not ... enough*	POST-TEST *So, Such a, Too, Not ... enough*
Group A	4.29	6.8	4.35	7.4
Group B	4.49	5.74	4	6.48

In order to analyse the materials' effectiveness, we can see that all students obtained better results in the grammar post-test than in the pre-test, regardless of the kind of instruction they received. We can see that Group A obtained 4.29 points out of 10 in the pre-test, and 6.79 in the post-test in the use of *verbs with prepositions,* while Group B got 4.49 in the pre-test, and 5.74 in the post-test (see Table 4). Therefore, Group A improved 2.51 points and group B 1.25 (see Table 5).

In the grammatical point *so, such a, too* and *not ... enough,* Group A scored 4.35 in the pre-test and 7.4 in the post-test, whereas Group B obtained 4 points in the pre-test and 6.48 in the post-test (see Table 4). Hence, Group A's main gain was 3.05 and Group B's was 2.48 (see Table 5). According to these results, we can appreciate that Group A outperformed Group B in both grammatical points and that both groups obtained better results in one grammar point, the one about the use of *so, such a, too* and *not ... enough.*

Table 5. Pre-test and post-test scores by Group A and Group B (main gains).

	Verbs with prepositions	*So, Such a, Too, Not … enough*
Group A	**2.51** (paper-based instruction)	**3.05** (computer-based instruction)
Group B	**1.25** (computer-based instruction)	**2.48** (paper-based instruction)

The results can also be compared attending to the method of instruction. Group A received textbook-based instruction on the point of *verbs with prepositions,* while Group B received computer-based instruction. If we compare the participants' scores in the related grammar post-tests, we can see that Group A obtained 6.8 points, an improvement of 2.51, and Group B 5.74, an improvement of 1.25 points. In this case, those students who received paper-based instruction outperformed those who took computer-based lessons. These results contradict previous studies which claim that those students who obtained better scores were the ones receiving computer-based instruction (Abu-Seileek's, 2007; Abu-Naba'h, 2012; Lys, 2013; Nutta, 1998; Torlaković & Deugo, 2004). Nevertheless, this opens new paths of research into this matter and the role that the content plays in the results should be studied more deeply.

The contrary took place when comparing the scores obtained in the use of *so, such a, too* and *not ... enough.* The group which received computer-based instruction, Group A, got 7.4 points, an improvement of 3.05. Group B, which received textbook-based instruction, obtained 6.48 points, a gain of 2.48. These results show that those students who took computer-based lessons got better marks and a higher improvement in this grammar point. These results contradict the previous ones which seemed to show that those students who took textbook-based lessons got better marks and, consequently, they do not allow us to make claims about the effectiveness of any method of instruction.

However, according to these findings, it seems that the improvement in both groups' performances was more linked to the grammar point than to the method of instruction, since both groups did better in the use of *so, such a, too* and *not ... enough.* Further research should be done to confirm this.

As it has been shown, the scores of both groups improved in the post-test, therefore, we must conclude that both methods of instruction were successful. These scores reflect that Group A outperformed Group B in both grammar points, regardless of the method of instruction and the materials. Based on these results, we cannot state which of both methods is more effective. The different results can be due to a number of reasons. The first might be that, although both groups had the same proficiency level of English, they differed considerably in their learning attitudes and their disposition towards this research. Group A was more participative, got less distracted and was more interested in learning. On the contrary, Group B was less eager to collaborate, students did not take these lessons so seriously and they were less attentive during the classes. The second possible explanation could be that, since both groups showed a larger improvement in the same grammar structures, results point to the fact that the participants found the use of *so, such a, too* and *not ... enough* easier than the other grammar point.

We also wanted to analyse students' perceptions on the different methods of instruction and materials. Nowadays, children and adolescents are constantly exposed to new technologies and they are continually using them. Moreover, these students are believed to generally find ICT-based lessons more attractive than any traditional lesson in which paper-based materials are used. However, there are still doubts about whether students can use them for learning purposes and thus, students' perceptions were analysed through three different questionnaires.

In Table 6 we can see the participants' points of view regarding the use of paper-based materials.

Table 6. Students' perceptions on textbook-based instruction.

The lesson…	Strongly agree (5)	Agree (4)	Uncertain (3)	Disagree (2)	Strongly disagree (1)	MEAN (from 1 to 5)
was appropriate to my age and level of English	14 (31.11%)	29 (64.44%)	1 (2.22%)	1 (2.22%)	0 (0%)	**4.3**
was appropriate to my learning needs.	11 (24.44%)	30 (66.67%)	3 (6.67%)	0 (0%)	1 (2.22%)	**4.1**
provided me with enough practice.	9 (20%)	11 (24.44%)	13 (28.89%)	11 (24.44%)	1 (2.22%)	**3.35**

contained a clear and sufficient explanations of the grammar point.	19 (42.22%)	19 (42.22%)	7 (15.56%)	0 (0%)	0 (0%)	**4.2**
contained varied and interesting activities.	11 (24.44%)	14 (31.11%)	13 (28.89%)	7 (15.56%)	0 (0%)	**3.64**
was clearly organized.	15 (33.33%)	22 (48.89%)	7 (15.56)	1 (2.22%)	0 (0%)	**4.13**
provided me with examples and explanations of how to use the structure in different situations.	22 (48.89%)	18 (40%)	5 (11.11%)	0 (0%)	0 (0%)	**4.38**
offered material which was easy to use.	18 (40%)	24 (53.33%)	2 (4.44%)	1 (2.22%)	0 (0%)	**4.31**
the material had clear instructions to all the activities.	14 (31.11%)	25 (55.56%)	6 (13.33%)	0 (0%)	0 (0%)	**4.18**

In general, students agreed that the lesson was appropriate for their age and English level (64.44%/M= 4.3) and for their learning needs (66.67%/M= 4.1), that it contained sufficient explanations (42.22%/M= 4.2) and varied and interesting activities (31.11%/M= 3.64), that the class was clearly organized (48.89%/M= 4.13), that it provided them with enough examples and explanations (48.89%/M= 4.38), that the materials were easy to use (53.33%/M= 4.31) and that they had clear instructions to all the activities (55.56%/M= 4.18). However, they were not so satisfied with the practice that paper-based materials offered during that lesson (28.89% were uncertain of this/M= 3.35). Nevertheless, we can say that students were quite pleased with this kind of instruction since few students disagreed or strongly disagreed with the questionnaire sentences.

The same questionnaire was handed out after the computer-based instruction and Table 7 shows the participants' opinions on online materials.

Table 7. Students' perceptions on computer-based instruction.

The lesson…	Strongly agree (5)	Agree (4)	Uncertain (3)	Disagree (2)	Strongly disagree (1)	MEAN (from 1 to 5)
was appropriate to my age and level of English	29 (64.44%)	11 (24.44%)	4 (8.89%)	0 (0%)	1 (2.22%)	**4.48**
was appropriate to my learning needs.	21 (46.67%)	16 (35.56%)	7 (15.56%)	0 (0%)	1 (2.22%)	**4.24**
provided me with enough practice.	18 (40%)	21 (46.67%)	6 (13.33%)	0 (0%)	0 (0%)	**4.27**
contained a clear and sufficient explanations of the grammar point.	21 (46. 67%)	13 (28.89)	10 (22. 22%)	1 (2.22%)	0 (0%)	**4.2**
contained varied and interesting activities.	18 (40%)	17 (37. 78%)	9 (20%)	0 (0%)	1 (2.22%)	**4.13**
was clearly organized.	20 (44. 44%)	15 (33.33%)	10 (22.22%)	0 (0%)	0 (0%)	**4.22**
provided me with examples and explanations of how to use the structure in different	25 (55.56%)	16 (35.56%)	4 (8.89%)	0 (0%)	0 (0%)	**4.47**

	Strongly agree (1)	Agree (2)	Uncertain (3)	Disagree (4)	Strongly disagree (5)	MEAN
situations.						
offered material which was easy to use.	23 (51.11%)	11 (24.44%)	8 (17.78%)	3 (6.67%)	0 (0%)	**4.2**
the material had clear instructions to all the activities.	21 (46.67%)	18 (40%)	4 (8.89%)	1 (2.22%)	1 (2.22%)	**4.27**

As we can see in Table 7, participants were highly satisfied with computer-based instruction. The majority of them strongly agreed with the sentences that claimed that the lesson had been appropriate for their age and level of English (64.44%/M= 4.48), that it had been appropriate to their learning needs (46.67%/M= 4.24), that it contained a clear and sufficient explanation of the studied grammar points (46.67%/M= 4.2), that it contained varied and interesting activities (40%/M= 4.13), that the lesson was clearly organized (44.44%/M= 4.22), that it had provided students with examples and explanations of how to use the grammatical structure in different contexts (55.56%/M= 4.47) and that the offered material was easy to use (51.11%/M= 4.2) and that it contained clear instructions to all the activities (46.67%/M= 4.27). However, participants were not so satisfied with the amount of practice that these online materials offered (46.67% agreed with this sentence/M= 4.27) which appears as the weakest point of the instruction according to these results.

From these results we can state that, although students seemed to have been very pleased with both methods of instruction, computer-based instruction obtained higher satisfaction scores. Moreover, it is interesting to notice that in both questionnaires students stated that both types of materials should have provided more practice. Nevertheless, this dissatisfaction with the amount of practice can be due to the shortage of time, since the classes had been quite brief.

Regarding the comparison questionnaire, results in Table 8 show an evident preference for computer-based instruction.

Table 8. Students' perceptions on the material comparison.

		Strongly agree (1)	Agree (2)	Uncertain (3)	Disagree (4)	Strongly disagree (5)	MEAN
Useful and effective	paper-based materials	21 (46.67%)	14 (31.11%)	7 (15.56%)	1 (2.22%)	2 (4.44%)	**4.13**

|							Mean
for grammar practice	online materials	28 (62.22%)	13 (28.89%)	4 (8.89%)	0 (0%)	0 (0%)	**4.53**
Easy to use	paper-based materials	14 (31.11%)	14 (31.11%)	17 (37.78%)	0 (0%)	0 (0%)	**3.93**
	online materials	21 (46.67%)	14 (31.11%)	8 (17.78%)	1 (2.22%)	1 (2.22%)	**4.17**
Positive learning experience	paper-based materials	13 (28.89%)	15 (33.33%)	13 (28.89%)	4 (8.89%)	0 (0%)	**3.82**
	online materials	28 (62.22%)	10 (22.22%)	7 (15.56%)	0 (0%)	0 (0%)	**4.47**
I am motivated to use	paper-based materials	12 (26,67%)	11 (24,44%)	16 (35,56%)	4 (8,89%)	2 (4,44%)	**3.6**
	online materials	24 (53.33%)	9 (20%)	9 (20%)	3 (6.67%)	0 (0%)	**4.2**

More than half of the participants strongly agreed on the facts that they had found computer-based materials useful and effective for grammar practice (62.22%/M= 4.53), that practising grammar using online materials was a positive learning experience (62.22%/M= 4.47) and that they felt motivated to use these kind of materials for grammar practice in the future (53.33%/M= 4.2). On the contrary, they were not so eager to continue using paper-based materials (just 26.67% strongly agreed on this/M= 3.6). Apart from this, it is also interesting to note that less than half of the participants strongly agreed with the sentence that claimed that using online-materials was easy. As it can be seen in the following table, some of the students assured that they were not very used to using computers for academic purposes and they were not very familiar with educative programs or websites (some of them even had problems when using word processors such as Word).

In Figure 1, we can take a look at the means of the student's perceptions on the material comparison. This graphic shows that participants were more satisfied with online-based materials in all aspects. Regarding usefulness and effectiveness, paper-based materials got 4.13 points, while online-based materials got 4.53. In the question that asked whether those materials were easy to use, paper-based materials received 3.93 points, while online-based ones received 4.17. In the sentence about the positive learning experience, paper-based materials got 3.82 points and online-based ones 4.47.

Finally, in the question about motivation, paper-based resources obtained 3.6 points, while online ones got 4.2.

Figure 1. Students' perceptions on the material comparison (means).
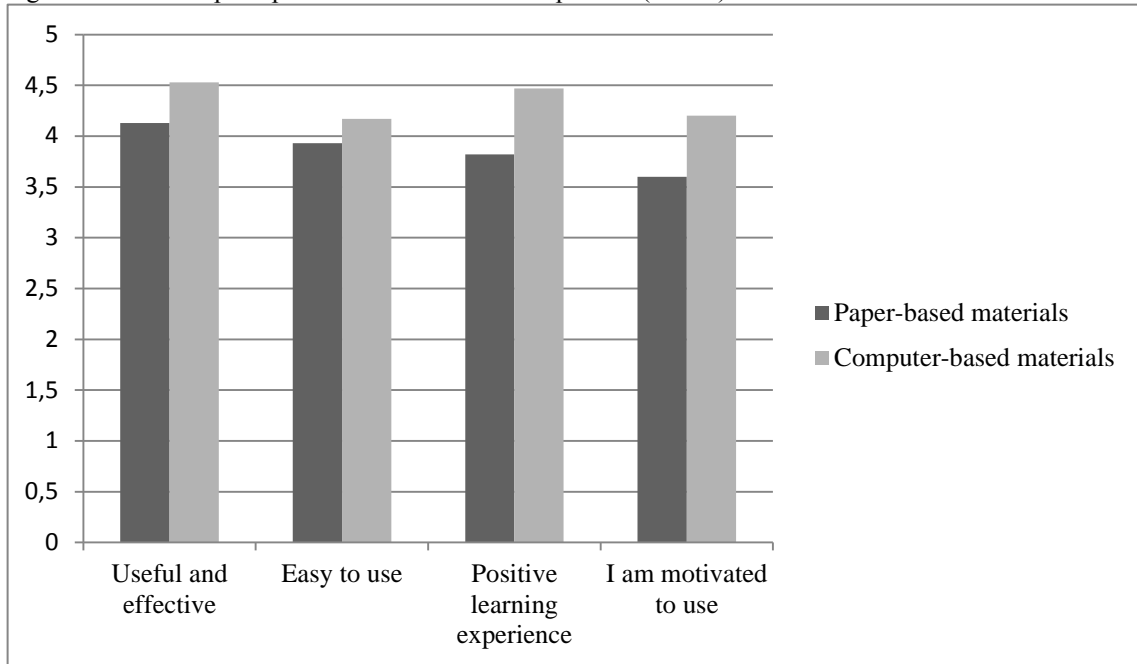
Finally, Table 9 shows students' views on the advantages and disadvantages of paper and online materials. It is important to highlight that not all the students filled in this question and that some of their answers were irrelevant for this study and, thus, not taken into account in the analysis.

Table 9. Students' perceptions on the advantages and disadvantages of the materials (number of responses).

	Advantages	Disadvantages
Paper-based material	Writing down the answers and exercises helps you study and memorise the contents (6) It is more complete (4) It is always available (3) You are more focused on the task (3) It is quicker (3) It is less complicated to use (2)	It is more boring (5) A lot of paper is wasted (5) You can lose this material (4) It is more messy (3) It is more expensive (2)
Online material	It is more fun (16) It is more manageable (10)	Sometimes computers are very slow (8)

16

	It is motivating (7)	Sometimes these materials do not work correctly (7)
	It is easier to erase your mistakes (5)	The Internet connection can fail (6)
	You can have it well organised (2)	Looking at the screen can be tiring (5)
	It is cleaner (1)	If the computer fails, your work can be lost (4)
	You have a great variety of exercises (1)	You get more distracted (1)
		Not everyone has a computer at home (1)

Table 9 shows interesting participants' opinions on these materials. The biggest advantage of paper-based materials for these students was that they helped them memorise the English grammar contents more easily than online ones. Moreover, they argued that textbooks were more complete, which can be due to a shortage of theoretical contents in the online materials. Also, that books and papers are always at hand, an argument which also appeared in Jarvis and Szymczyk's (2009) study, in which participants claimed that they could take paper-based materials wherever they wanted. Besides, students said that these materials helped them concentrate on the activities, that using them was quicker (since you do not need to switch on your computer or wait for a website to load) and that using them was easier. This last assertion is linked to the fact that students do not seem to be familiar with using computers for academic purposes. This shows that computers are not used as much as it should be expected in educative contexts, confirming the results of previous research (Charpentier Jiménez, 2014; Jarvis & Szymczyk, 2009). Nevertheless, during the computer-based lesson all the students learned how to use the online exercises very quickly.

Among the biggest disadvantages attributed to using paper-based materials for English grammar learning, students highlighted in the first place that it was more boring. Besides, they were aware of the fact that a lot of paper is wasted, which shows their environmental concern. The participants also said that this kind of material can be easily lost, while online material is always saved in your computer or on the Internet. Finally, another important disadvantage was that textbooks in general are quite expensive, while online materials are usually free.

Regarding online materials, the students exposed several pros of using them. The majority of the participants claimed that using computer-based materials was more fun, since it was a new experience for them. They also said that it was more manageable, more motivating and that it was easier to erase your mistakes. They gave a lot of importance to the fact that thanks to this method they could have their material better organised and neat. Moreover, the students thought that online materials offered a great variety of exercises, as opposed to textbooks.

However, some disadvantages were also exposed, such as the fact that sometimes these materials did not work correctly. In fact, technical problems happened

at the instructional period and students mentioned them. Some of the computers were broken, the Internet connection was not very fast and students lost interest and patience while waiting for the webpages to load. Moreover, some of the participants' exercises could be lost if the connection failed, so they had to start doing them again. Apart from this, they said that looking at the computer's screen could be tiring, although they had not been exposed for such a long time to this as to be actually tired. Another interesting point is that they realized that they were more distracted using computers, although again this can be due to the fact that they did not work quickly enough, and they started talking with their classmates while they were waiting for the exercises to load. Lastly, the participants saw as a con that not everyone had a computer at home. Nevertheless, this cannot be taken as a serious disadvantage since students can always use computers at school or in the library.

In short, we have seen that both kinds of materials seem to have advantages and disadvantages for students. The most emphasised advantage of paper-based materials was that writing your exercises down helps you memorising. However, this could be due to the students' lack of computer-based learning habits. Most of them still saw computers as resources for playing games, so they did not take the contents that they saw in the screen seriously. This confirms previous studies (Charpentier Jiménez, 2014) that show that the transference from personal use to academic and educative use has not been reached yet. In this way, it was not surprising to find out that the most important disadvantage for them was that paper-based materials were more boring for grammar practice. On the contrary, they thought that online materials were much more entertaining and motivating. This could also be appreciated during the lesson, since students were having fun doing the exercises and competing against each other. Moreover, it was also quite telling that they did not enter other websites; they were quite focused on the exercises. However, a huge disadvantage of online resources was that computers and the Internet did not always work correctly. This is not always a problem, but teachers need to be aware of this and judge whether a computer-based lesson can be carried out without problems before each class.

5. Conclusion

In this digitalized era, ICTs are beginning to be seen as very useful educative tools and they are starting to be included in the classrooms. Computers and other digital devices are used for learning purposes, but little research has been conducted yet on their effectiveness and on students' perceptions of this usage.

The grammar tests' results in this study reflected that the students' improvement was more related to the content than to the method of instruction. Both groups obtained better results in the post-tests, showing that their grammatical knowledge improved regardless of the kind of instruction. Nevertheless, results also showed that learners got higher scores in the same grammatical point, the one about the use of *so, such a, too* and *not ... enough*. These findings put into question, not the effectiveness of computer-based instruction, but the cause of students' progress.

In the same way, results revealed that in the grammatical point *verbs with prepositions* students receiving paper-based instruction outperformed those taking computer-based instruction. However, the contrary happened when analysing students' performance in the usage of *so, such a, too* and *not ... enough*. In this case, students

receiving computer-based lessons got higher scores than those receiving paper-based instruction. Accordingly, the grammar test results do not allow us to conclude which of the methods of instruction was more effective. What is clear is that students' improvement was more linked to the grammar point being tested than to the method of instruction. In this way, more research needs to be conducted on the importance of content in grammar acquisition and its relationship with the different instructional methods.

From the information gathered through the first and the second questionnaires, we can state that students were in general satisfied both with paper-based and computer-based methods of instructions. Nonetheless, we could appreciate that students rated more favourably computer-based instruction. Apart from this, participants expressed that they would have liked to be provided with more practice in both cases. This could be due to the shortage of time and longer periods of instructions should be needed in future research.

Again, in the materials comparison questionnaire, we can see that more than half of the participants had found computer-based materials useful, effective and motivating for grammar practice, while a small number of students preferred to use paper-based materials in the future. This questionnaire also showed that most students found computer-based materials hard to use. These findings demonstrate that students are rather unfamiliar with the use of ICTs, particularly for learning purposes. In this way, this suggests that teachers need to show students how to use these new materials and, in order to do so, it seems necessary to include them more frequently in the classroom, so students can feel confident to use them.

Finally, we have also seen that students expressed different advantages and disadvantages of the use of paper-based and computer-based materials. In general, it seems that paper-based materials were perceived as more helpful to memorise contents, while computer-based materials were seen as more entertaining and motivating. Regarding the disadvantages, paper-based materials were seen as more boring and computer-based materials provoked dissatisfaction with the bad functioning of computers and Internet connection. Consequently, although students are still more used to using paper-based materials for academic purposes, they are more motivated when using online resources. This means that secondary education students need to be more familiar with ICTs and that the quality of these resources needs to be improved for a good and meaningful use of them.

Acknowledgements

Bibliography

Abu-Naba'h, A. M. (2012). The impact of computer assisted grammar teaching on EFL pupils' performance in Jordan. *International Journal of Education and Development using Information and Communication Technology (IJEDICT),* 8(1), 71-90.

Abu-Seileek, A. (2007). The Effect of Computer-Based Grammar Instruction on the Acquisition of Verb Tenses in an EFL Context. *The JALT CALL Journal,* 3(1-2), 59-80.

Barraclough, C. & Gaynor, S. (2013) *Activate! B1.* Essex: Pearson.

Charpentier Jiménez, W. (2014). The Use of ICTs in the BA in English Teaching. *Rev. Actualidades Investigativas en Eduación,* 14(1), 1-23.

Jarvis, H. & Szymczyk, M. (2009). Student views on learning grammar with web- and book-based materials. *ELT Journal,* 64(1), 32-44.

Lys, F. (2013). Computer-mediated grammar practice and its effect on different language tasks. In P. Hubbard, M. Schulz & B. Smith (Eds), *Learner-computer interaction in language education: A Festschrift in honor of Robert Fischer* (pp. 166-186). San Marcos, TX: CALICO.

Nutta, J. (1998). Is computer-based grammar instruction as effective as teacher-directed grammar instruction for teaching L2 structures? *CALICO Journal, 16*(1), 49-62.

Torlakovic, E. & Deugo, D. (2004). Application of a CALL system in the acquisition of adverbs in English. *Computer Assisted Language Learning*, 17(2), 203-235.

APPENDIXES

APPENDIX 1. GRAMMAR TESTS.

PRE-TEST

Name: Class:

-Choose the correct word:

1. Look _____ all this rubbish on the floor!

 a) to b) at c) by

2. I think he's _____ young to drive a car.

 a) such b) so c) too

3. They all laughed _____ her jokes. She is a very funny girl.

 a) at b) of c) with

4. The teacher was _____ happy about our results, that she brought us some candies.

 a) so b) too c) such

5. She talks _____ her mother on the phone every week.

 a) with b) to c) at

6. That is _____ good film. I would like to see it again.

 a) such b) so c) such a

-Complete the sentences with the correct word:

1. My brothers are always arguing _____ each other.

2. When I can't find my shoes, I always ask my mother to look _____ them.

3. My little sister is _____ old _____ to stay at home alone.

4. The exam was a bit _____ difficult for me. I think I'm going to fail it.

5. If you want to go to the toilet, you need to ask _____ permission.

-Complete the following sentences using the word in brackets:

1. Do you like my new hairstyle? No, it's _____ _____. (short)

2. I don't want people to _____ _____ _____ _____ _____.
(judge/me/clothes)

3. Are you going to buy a Ferrari? No, I'm _____ _____ _____ to buy one.
(rich)

4. I like what you say, I _____ _____ _____. (agree/you)

5. Look at your bedroom! It is _____ _____ _____. (mess)

POST-TEST

Name: Class:

-Choose the correct word:

1. The movie was _____ boring that I fell asleep.

     a) so   b) too   c) such

2. It is _____ sunny day outside.

     a) such   b) so   c) such a

3. It is very rude to laugh _____ other people's appearance.

     a) at   b) of   c) with

4. Call me back as soon as possible, I need to talk _____ you.

     a) with   b) to   c) at

5. The whole class looked _____ me when I fell down.

     a) to   b) at   c) by

6. This exercise is _____ difficult for me.

     a) such   b) so   c) too

-Complete the sentences with the correct word:

1. Where were you? I have been looking _____ you.

2. I am _____ rich _____ to buy a mansion, so I live in a flat.

3. Tim argued _____ his father about his pocket money.

4. She asked _____ help when she got lost in London.

5. I can't drink this coffee, it is _____ hot!

-Complete the following sentences using the word in brackets:

1. You need to tidy up your room, it is _____ _____ _____! (disaster)

2. It is not fair to _____ _____ _____ _____ _____.
(judge/people/appearance)

3. I need a smaller T- shirt because this one is _____ _____. (big)

4. We are so different! I could never _____ _____ _____. (agree/you)

5. He is not going to win this chess game, he is _____ _____ _____. (clever)

APPENDIX 2. QUESTIONNAIRES.

CUESTIONARIO DE EVALUACIÓN DE LA CLASE CON MATERIAL ONLINE

Nombre:

Edad:

Sexo:

Clase:

Piensa en el material que acabas de usar y marca la casilla que te parezca más adecuada:

La clase…	Muy de acuerdo	De acuerdo	Ni de acuerdo ni en desacuerdo	En desacuerdo	Muy en desacuerdo
era apropiada para mi edad y nivel de inglés.					
era apropiada para mis necesidades de aprendizaje.					
me permitió practicar mucho.					
contenía explicaciones claras y suficientes sobre el punto gramatical estudiado.					
contenía actividades variadas e interesantes.					
estaba claramente organizada.					
me dio ejemplos y explicaciones de cómo usar el punto gramatical estudiado en diferentes situaciones.					
contenía material fácil de usar.					
contenía material con instrucciones claras para todas las actividades.					

CUESTIONARIO DE EVALUACIÓN DE LA CLASE CON MATERIAL EN PAPEL

Nombre:

Edad:

Sexo:

Clase:

Piensa en el material que acabas de usar y marca la casilla que te parezca más adecuada:

La clase…	Muy de acuerdo	De acuerdo	Ni de acuerdo ni en desacuerdo	En desacuerdo	Muy en desacuerdo
era apropiada para mi edad y nivel de inglés.					
era apropiada para mis necesidades de aprendizaje.					
me permitió practicar mucho.					
contenía explicaciones claras y suficientes sobre el punto gramatical estudiado.					
contenía actividades variadas e interesantes.					
estaba claramente organizada.					
me dio ejemplos y explicaciones de cómo usar el punto gramatical estudiado en diferentes situaciones.					
contenía material fácil de usar.					
contenía material con instrucciones claras para todas las actividades.					

CUESTIONARIO DE COMPARACIÓN DE MATERIALES

Nombre:

Edad: Clase:

Sexo:

Piensa en los dos tipos de materiales que hemos usado (en papel y las páginas web) y marca la casilla que te parezca más apropiada:

	Muy de acuerdo	De acuerdo	Ni de acuerdo ni en desacuerdo	En desacuerdo	Muy en desacuerdo
El material en papel me parece útil y efectivo para practicar gramática.					
El material online me parece útil y efectivo para practicar gramática.					
El material en papel me parece fácil de usar.					
El material online me parece fácil de usar.					
Practicar gramática con el material en papel me pareció una experiencia positiva.					
Practicar gramática con el material online me pareció una experiencia positiva.					
Me siento motivado cuando uso materiales en papel y me gustaría seguir usándolos en el futuro.					
Me siento motivado cuando uso materiales online y me gustaría seguir usándolos en el futuro.					

Por favor, rellena la siguiente tabla:

	Ventajas	Desventajas
Material en papel	- - -	- - -
Material online	- - -	- - -

APPENDIX 3. PRE-TEST AND POST-TEST SCORES BY GROUP A AND GROUP B (GRADES OUT OF 10 POINTS).

STUDENTS	PRE-TEST	POST-TEST	PRE-TEST	POST-TEST
Group A	*Verbs with prepositions*	*Verbs with prepositions*	*So, Such a, Too, Not … enough*	*So, Such a, Too, Not … enough*
Student 1	2.5	3.75	6.25	7.5
Student 2	5	10	5	8.75
Student 3	5	8.75	1.25	2.5
Student 4	2.5	5	3.75	5
Student 5	6.25	10	3.75	10
Student 6	6.25	10	6.25	8.75
Student 7	2.5	3.75	6.25	6.25
Student 8	2.5	10	3.75	8.75
Student 9	3.75	5	3.75	5
Student 10	1.25	8.75	0	8.75
Student 11	2.5	5	3.75	5
Student 12	2.5	5	5	10
Student 13	3.75	6.25	5	7.5
Student 14	5	7.5	5	10
Student 15	6.25	3.75	5	6.25
Student 16	7.5	7.5	6.25	7.5
Student 17	7.5	3.75	5	5
Student 18	3.75	8.75	5	8.75
Student 19	5	8.75	5	10
Student 20	3.75	6.25	3.75	5

Student 21	1.25	3.75	1.25	7.5
Student 22	5	6.25	3.75	6.25
Student 23	7.5	8.75	6.25	10
MEAN	**4.29**	**6.8**	**4.35**	**7.4**
Group B				
Student 24	3.75	3.75	3.75	5
Student 25	1.25	6.25	2.5	5
Student 26	6.25	7.5	7.5	7.5
Student 27	5	5	5	8.75
Student 28	3.75	6.25	3.75	8.75
Student 29	3.75	5	3.75	5
Student 30	5	10	2.5	3.75
Student 31	2.5	2.5	2.5	5
Student 32	6.25	8.75	5	10
Student 33	2.5	3.75	2.5	3.75
Student 34	6.25	7.5	3.75	5
Student 35	5	7.5	5	8.75
Student 36	6.25	5	3.75	6.25
Student 37	3.75	3.75	5	8.75
Student 38	6.25	5	3.75	7.5
Student 39	5	7.5	3.75	8.75
Student 40	2.5	2.5	2.5	5
Student 41	5	3.75	3.75	3.75
Student 42	7.5	6.25	5	7.5

Student 43	2.5	7.5	3.75	6.25
Student 44	3.75	5	5	6.25
Student 45	5	6.25	5	6.25
MEAN	**4.49**	**5.74**	**4**	**6.48**